

## STAFF SUMMARY FOR APRIL 17, 2019

**15. MAMMAL HUNTING****Today's Item**Information Action 

Consider adopting proposed changes to mammal hunting regulations for bighorn sheep, elk, elk (SHARE), and deer and elk tag validation.

*Staff recommends that this item be continued to the May 16, 2019 teleconference meeting for potential adoption.*

**Summary of Previous/Future Actions**

- |  |                                   |
|--|-----------------------------------|
| • WRC vetting                          | Sep 20, 2018; WRC, Sacramento     |
| • Notice hearing                       | Dec 12-13, 2018; Oceanside        |
| • Discussion hearing                   | Feb 6, 2019; Sacramento           |
| • <b>Today's hearing</b>               | <b>Apr 17, 2019; Santa Monica</b> |
| • Adoption hearing (if approved today) | May 16, 2019; Teleconference      |

**Background**

FGC approves tag counts, hunt zones, and seasons for Nelson bighorn sheep, elk, and SHARE elk hunts; final tag, zone, and season recommendations are provided in pre-adoption statements of reasons (PSOR) (exhibits 1, 4 and 5, respectively). Proposed tag countersigning/validation requirement changes are found in the initial statement of reasons (ISOR) published in Jan 2019 (Exhibit 10).

While public review of the California Environmental Quality Act (CEQA) documents for bighorn sheep and elk commenced on Feb 19, 2019, the full 45-day review period for CEQA documents filed with county clerks will not be completed until May 6, 2019. Therefore, continuing the adoption hearing to the May 16, 2019 teleconference would accommodate the additional CEQA review timeline. A 15-day notice that the adoption hearing may be continued from today's meeting to the teleconference, to allow for additional CEQA review, was published on Mar 22, 2019 in anticipation of today's potential action (Exhibit 11).

Additionally, DFW has identified minor changes, noted in the text of the PSORs, that will require a new 15-day notice:

- simplifying the boundary description of Zone 10 for Nelson bighorn sheep (Exhibit 1),
- updating the noticed range and final tag recommendation for the Northwestern Elk Hunting Zone (subsection 364.1(i)(2)), and
- change the number of antlerless tags for the Northeast California Elk Hunting Zone (subsection 364.1(j)(1)) (Exhibit 5).

No changes are proposed to the tag countersigning/validation requirements as proposed in the ISOR.

## STAFF SUMMARY FOR APRIL 17, 2019

**Significant Public Comments**

1. No public comments have been received since the Feb 6, 2019 discussion hearing regarding the proposed text of the regulations.
2. Three comments have been received regarding concerns with the draft supplemental environmental document for elk (Exhibits 7-9).

**Recommendation**

**FGC staff:** Continue adoption of both the draft CEQA documents and the proposed regulation changes to the May 16, 2019 teleconference to allow for the full 45-day CEQA comment period, and authorize staff to publish a second 15-day notice with the additional proposed changes.

**Exhibits**

1. [Nelson bighorn sheep PSOR](#)
2. [Nelson bighorn sheep management plan for the Newberry, Rodman and Oro Mountains Unit, dated April 14, 2019](#)
3. [Nelson bighorn sheep CEQA filing and draft environmental document, filed Feb 19, 2019](#)
4. [Elk PSOR](#)
5. [SHARE elk hunts PSOR](#)
6. [Elk CEQA notice of completion and draft supplemental environmental document, filed Feb 19, 2019](#)
7. [Email comments from Phoebe Lenhart regarding elk CEQA, received Apr 3, 2019](#)
8. [Letter and documents from Friends of Del Norte regarding elk CEQA, received Apr 4, 2019](#)
9. [Letter from the Environmental Protection Information Center regarding elk CEQA, received Apr 4, 2019](#)
10. [Tag countersigning/validation ISOR](#)
11. [15-day notice, dated Mar 22, 2019](#)

**Motion/Direction**

Moved by \_\_\_\_\_ and seconded by \_\_\_\_\_ that the Commission authorizes staff to publish notice confirming it has continued to its May 16, 2019 teleconference consideration of adopting proposed changes to sections 362, 364, 364.1 and 708.6 regarding mammal hunting and tag validation regulations, and to further notice sufficiently-related additional changes to sections 362 and 364.1.



V. Reasons for Modification of Originally Proposed Language of Initial Statement of Reasons:

(a) Number of tags

Section 4902 of the Fish and Game Code specifies the Commission may adopt regulations for the take of no more than 15 percent of the mature Nelson bighorn rams estimated in a management unit. The Department's final recommendation specifies tag allocations that fall within the allowable harvest:

Zone 1 – The number of mature Nelson bighorn rams estimated in the Marble and Clipper Mountains is 106. Resulting final recommendation of 5 tags is less than 15% of estimated mature rams.

Zone 2 – In May 2013, respiratory disease caused severe population decline in bighorn sheep in the Kelso Peak/Old Dad Mountain Unit. The Department continues to monitor this population. While the population has shown positive recruitment trends in recent years, and the current estimate of mature rams in this unit is 28, the final recommendation at this time is zero tags for this unit.

Zone 3 – The number of mature Nelson bighorn rams estimated in the Clark/Kingston Mountains is 87. Resulting final recommendation of 4 tags is less than 15% of estimated mature rams.

Zone 4 – The number of mature Nelson bighorn rams estimated in the Orocopa Mountains is 22. The resulting final recommendation of one tag is less than 15% of estimated mature rams.

Zone 5 – In December 2018, a disease causing a severe population decline was detected in bighorn sheep in the San Gorgonio Wilderness Unit. The Department has not yet identified the root cause of the disease, and will continue to monitor the unit. At this time the final recommendation is zero tags for this unit.

Zone 6 – The number of mature Nelson bighorn rams estimated in the Sheep Hole Mountains is 11. The resulting final recommendation of tag is zero.

Zone 7 – The number of mature Nelson bighorn rams estimated in the White Mountains is 54. The resulting final recommendation of six tags is less than 15% of estimated mature rams.

Zone 8 – The number of mature Nelson bighorn rams estimated in the South Bristol Mountains is 21. The resulting final recommendation of two tags is less than 15% of estimated mature rams.

Zone 9 – The number of mature Nelson bighorn rams estimated in the Cady Mountains is 24. The resulting final recommendation of two general lottery

tags and one Cady Mountains Fund-raising Tag for a total of three tags is less than 15% of estimated mature rams.

Zone 10 – The number of mature Nelson bighorn rams estimated in the Newberry, Rodman and Ord Mountains is 84. The resulting final recommendation of six tags is less than 15% of estimated mature rams.

(b) Establishment of the Newberry, Rodman and Ord Mountains Hunt Zone

The original zone boundary description for the proposed Newberry, Rodman and Ord Mountains Hunt Zone identified a road name that was used for multiple roads in different directions. The zone boundaries were modified to improve clarity.

Section 4902 authorizes the Commission to adopt regulations for the sport hunting of Nelson bighorn sheep rams in management units for which plans have been developed pursuant to Section 4901 of the Fish and Game Code. A unit plan has been completed, and surveys and data analysis estimate the population within the management unit to be approximately 256 desert bighorn sheep with a positive trend in recruitment.

VI. Summary of Primary Considerations Raised in Opposition and in Support:

One public comment was received regarding proposed 2019 Nelson bighorn sheep hunting regulations as of March 20, 2019.

Comment:

Bill Gaines, Rocky Mountain Elk Foundation, and the California Chapter of the Wild Sheep Foundation.

February, 6, 2019, Fish and Game Commission Meeting:

Supports the Department's elk and bighorn sheep proposal.

Response: Thank you for your comment.

Updated Informative Digest/Policy Statement Overview

The current regulation in Section 362, Title 14, CCR, provides for limited hunting of Nelson bighorn rams in specified areas of the State. The proposed change is intended to adjust the number of tags available for the 2019 season based on bighorn sheep spring population surveys conducted by the Department.

Final tag quota determinations will be made pending completion of all surveys and data analyses.

<b>HUNT ZONE</b>	<b>NUMBER OF TAGS [proposed range]</b>
Zone 1 - Marble Mountains	[0-5]
Zone 2 - Kelso Peak/Old Dad Mountains	[0-4]
Zone 3 - Clark/Kingston Mountain Ranges	[0-4]
Zone 4 - Orocopia Mountains	[0-2]
Zone 5 - San Gorgonio Wilderness	[0-3]
Zone 6 - Sheep Hole Mountains	[0-2]
Zone 7 - White Mountains	[0-6]
Zone 8 - South Bristol Mountains	[0-3]
Zone 9 – Cady Mountains	[0-4]
Zone 10 – Newberry, Rodman, Ord Mountains (New)	[0-6]
Open Zone Fund-Raising Tag	[0-1]
Marble/Clipper/South Bristol Mountains Fund-Raising Tag	[0-1]
Cady Mountains Fund-Raising Tag (New)	[0-1]
<b>TOTAL</b>	<b>[0-42]</b>

Other Amendments:

- Establishment of the Newberry, Rodman and Ord Hunt Zone: The proposed change adds this new bighorn sheep hunt zone in San Bernardino County.
- Reallocation of the Kelso Peak/Old Dad Mountains Fund-Raising to the Cady Mountains: The Kelso Peak/Old Dad herd unit has experienced significant population decline following a recent outbreak of respiratory disease. The proposal would reallocate this fund-raising tag to be valid in the Cady Mountains Hunt Zone.

- Amend the contact telephone number that is no longer in use for the program. The proposed Editorial Change provides a current contact phone number.

#### Benefits of the regulations

The benefits of the proposed regulations are consistency with statute and the sustainable management of the State’s wildlife resources.

#### Non-monetary benefits to the public

The Commission does not anticipate non-monetary benefits to the protection of public health and safety, worker safety, the prevention of discrimination, the promotion of fairness or social equity, and the increase in openness and transparency in business and government.

#### Evaluation of incompatibility with existing regulations

The Commission has reviewed its regulations in Title 14, CCR, and conducted a search of other regulations on this topic and has concluded that the proposed amendments are neither inconsistent nor incompatible with existing State regulations. No other State agency has the authority to promulgate wildlife hunting regulations.

**Tag quota determinations have been made, following completion of surveys and data analysis. Surveys and data analysis support the establishment of the Newberry, Rodman and Ord Hunt Zone based upon population size and current understanding of Nelson bighorn sheep health and recruitment. Zone boundaries for the Newberry, Rodman, and Ord Hunt Zone have been modified for clarity and will be included in a 15-day notice to interested and affected parties.**

HUNT ZONE	NUMBER OF TAGS
Zone 1 - Marble Mountains	<u>5</u>
Zone 2 - Kelso Peak/Old Dad Mountains	0
Zone 3 - Clark/Kingston Mountain Ranges	<u>4</u>
Zone 4 - Orocopia Mountains	1
Zone 5 - San Gorgonio Wilderness	<u>0</u>
Zone 6 - Sheep Hole Mountains	0
Zone 7 - White Mountains	<u>6</u>

Zone 8 - South Bristol Mountains	<u>2</u>
Zone 9 – Cady Mountains	<u>2</u>
Zone 10 – Newberry, Rodman, Ord Mountains (New)	<u>6</u>
Open Zone Fund-Raising Tag	1
Marble/Clipper/South Bristol Mountains Fund-Raising Tag	1
Cady Mountains Fund-Raising Tag (New)	<u>1</u>
<b>TOTAL</b>	<u>29</u>

Regulatory Language

Section 362, Title 14, CCR, is amended to read:

**§362. Nelson Bighorn Sheep**

(a) Areas:

*. . . [ No changes to subsections (a)(1) through (9) ]*

(10) Zone 10 – Newberry, Rodman and Ord Mountains: That portion of San Bernardino County beginning at the junction with Interstate Highway 40 and Fort Cady Road; West on Interstate Highway 40 to the junction with Barstow Road; South on Barstow Road to the junction with Northside Road; East on Northside Road to the intersection of Camp Rock Road; North on Camp Rock Road to the intersection with Powerline Road; East on Powerline Road and continue on Transmission Line Road to the intersection with Bessemer Mine Road/Canyon Route; North on Bessemer Mine Road/Canyon Route to the intersection with Troy Road; West on Troy Road to the intersection with Fort Cady Road; North on Fort Cady Road to the Junction with Interstate 40 to the point of the beginning. Interstate 40 and Barstow Road; South on Barstow Road to the junction with Northside Road; East on Northside Road to the intersection with Camp Rock Road; Northeast on Camp Rock Road to the intersection with Powerline Road; East on Powerline Road and continue on Transmission Line Road to the intersection with Interstate 40, West along Interstate 40, to the point of the beginning.

(b) Seasons:

*. . . [ No changes to subsections (b)(1) through (2) ]*

~~(3) Kelso Peak and Old Dad Mountains~~ Cady Mountains Fund-raising Tag: The holder of the fund-raising license tag issued pursuant to subsection 4902(d) of the Fish and Game Code may hunt:

~~(A) Zone 2:~~ Zone 9: Beginning the first Saturday in November and extending through the first Sunday in February.

(4) Except as provided in subsection 362(b)(1), the Nelson bighorn sheep season in the areas described in subsection 362(a) shall be defined as follows:

~~(A) Zones 1 through 4, 6, 8 and 9:~~ Zones 1, 2, 3, 4, 6, 8, 9, and 10: The first Saturday in December and extend through the first Sunday in February.

(B) Zone 5: The third Saturday in December and extend through the third Sunday in February.

(C) Zone 7: Beginning the third Saturday in August and extending through the last Sunday in September.

(5) Except as specifically provided in section 362, the take of bighorn sheep is prohibited.

*. . . [ No changes to subsection (c) ]*

d) Number of License Tags:

	<i>Tag</i>
<i>Nelson Bighorn Sheep Hunt Zones</i>	<i>Allocation</i>
Zone 1 - Marble/Clipper Mountains	-4- <u>5</u>
Zone 2 - Kelso Peak/Old Dad Mountains	0
Zone 3 - Clark/Kingston Mountain Ranges	-2- <u>4</u>
Zone 4 - Orocopia Mountains	1
Zone 5 - San Gorgonio Wilderness	-2- <u>0</u>
Zone 6 - Sheep Hole Mountains	0
Zone 7 - White Mountains	-3- <u>6</u>
Zone 8 - South Bristol Mountains	-1- <u>2</u>
Zone 9 - Cady Mountains	-4- <u>2</u>
<u>Zone 10 – Newberry, Rodman, Ord Mountains</u>	<u>6</u>
Open Zone Fund-Raising Tag	1
Marble/Clipper/South Bristol Mountains Fund-Raising Tag	1
<del>Kelso Peak/Old Dad Mountains</del> <u>Cady Mountains</u> Fund-Raising Tag	-0- <u>1</u>
Total:	-19- <u>29</u>

(e) Conditions:

. . . [ No changes to subsections (e)(1) through (3) ]

(4) Successful general tagholders shall present the head and edible portion of the carcass of a bighorn ram to the department's checking station within 48 hours after killing the animal. All successful tagholders shall notify the department's Bishop office by telephone at (760) 872-1171 or ~~(760) 413-9596~~ (760) 872-1346 within 24 hours of killing the animal and arrange for the head and carcass to be examined.

. . . [ No changes to subsections (e)(5) through (6) ]

Note: Authority cited: Sections 200, 203, 265, 1050 and 4902, Fish and Game Code.  
Reference: Sections 1050, 3950 and 4902, Fish and Game Code.

BIGHORN SHEEP MANAGEMENT PLAN: NEWBERRY, RODMAN AND ORO  
MOUNTAINS UNIT'

Prepared by:

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2019

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\*This plan was prepared in compliance with Section 4901 of the California Fish and Game Code.

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## **INTRODUCTION**

In 1986, Assembly Bill (AB) 3117 (Mountjoy) was enacted by the California Legislature. That legislation amended Section 4700, and added Sections 4900-4905, to the California Fish and Game Code (Code). The legislature declared that the bighorn sheep is an important wildlife resource in California and is to be managed and maintained at sound population levels. It also directed the Department of Fish and Game (now Wildlife) (Department) to prepare a management plan for each population (herd) of bighorn sheep in California. In addition, it authorized, for the first time in 108 years, very limited and carefully regulated harvest of mature male bighorn sheep.

In 1991, AB 977 was enacted by the legislature, and expanded the hunting program. In accordance with that legislation, it is the policy of the Department of Fish and Game to (1) maintain, improve, and expand bighorn habitat where feasible; (2) reestablish populations of bighorn sheep on historic ranges where feasible; (3) increase bighorn populations to levels such that no subspecies nor distinct population segment requires classification as threatened or endangered; and (4) encourage and provide for esthetic, educational, and recreational uses of bighorn sheep, as appropriate.

Overall statewide management goals and recommended actions are discussed in the draft statewide management plan for desert bighorn sheep. Once the statewide plan and sheep management unit plans are approved, they shall supersede this management plan. This management plan has been prepared specifically for the Newberry, Rodman and Ord Mountains Management Unit. It is intended to comply with legislative policy as set forth in Section 1801 of the California Fish and Game Code, and Sections 4900-4903 of the Code that, among other things, mandate that management plans be prepared for each bighorn sheep management unit, and that those plans provide information on (1) the numbers, age, sex ratios, and distribution of bighorn sheep within the management unit; (2) range conditions and a report on the competition that may exist as a result of human, livestock, wild burro, or any other mammal encroachment; (3) the need to relocate or reestablish bighorn populations; (4) the prevalence of disease or parasites within the population; and (5) recommendations for achieving the policy objective of Section 4900, which addresses the potential for limited hunting opportunities for bighorn sheep.

## **LOCATION**

The Newberry, Rodman and Ord Mountains Unit is comprised of three neighboring mountain ranges located in the central Mojave Desert, San Bernardino County. The Unit is centered approximately 17 miles southeast of the city of Barstow, and immediately south of Newberry Springs. The Newberry, Rodman and Ord Mountains Management Unit is bounded by U.S. Interstate 40 to the north, California State Route 247 to the west, Camp Rock Road to the south, and Powerline Road, continuing to Interstate 40 to the north. The Marine Corps Air Combat Center lies to the southeast of the range.

## HABITAT DESCRIPTION

Steep, maze-like canyons characterize the Newberry Mountains and the northern end of the Rodman Mountains. The southern end of the Rodman Mountains and the Ord Mountains give way to comparatively gentler slopes. Elevations range from 1189 m at Ericksen Dry Lake, to 1521 m in the Newberry Mountains, 4323 m in the Rodman Mountains, and up to 1922 m, at Ord Mountain. Geologically, the Newberry and Rodman mountains are underlain by Jurassic and Cretaceous plutonic rocks and by Miocene volcanic and sedimentary rocks and the Ord Mountains are formed Mesozoic metavolcanic rock (Cox et al. 1987, Weber 1963).

Weather conditions in this management unit are typical of the Mojave Desert. Daytime high temperatures in summer frequently exceed 38° C, and temperatures approaching freezing during winter are not uncommon. Precipitation in the vicinity of the management unit averages 6-8 inches annually. The Unit's dry climate is punctuated with monsoon rainfall in mid to late summer, and limited winter precipitation (Comrie and Glenn 1998).

Much of the Newberry, Rodman and Ord Mountain Mountains Management Unit is in public ownership, although some parcels of private land occur throughout the area. The majority of the public land is administered by the U.S. Bureau of Land Management (BLM) with a few parcels entrusted to the California State Lands Commission.

Desert bighorn primarily occupy the Newberry and Ord Mountains, while Rodman Mountains serve as transitional habitat during short forays or long-distance movements into the Bullion Mountains (Prentice et al. 2018). As discussed below, this variation in habitat use is likely due to a variety of factors including: water availability and/or reliability, forage presence and quality, elevation and temperature.

### Vegetation

There are three main vegetation communities within the Newberry, Rodman and Ord Management Unit. The predominant vegetation community is the creosote bush shrubland, followed by the Mojave yucca shrubland, and the blackbrush shrubland (Thomas et al. 2004). Creosote bush (*Larrea tridentata*) is commonly found in both rocky and well drained soils on alluvial fans, bajadas, small washes, and rocky slopes. Creosote and Mojave yucca (*Yucca schidigera*) often overlap between 700 and 1000 meters above sea level. Mojave yucca shrubland tends to occupy rocky slopes, upper bajadas and alluvial fans. Lastly, blackbrush (*Coleogyne ramosissima*) shrubland is found overlapping Mojave yucca, but tends to be slightly higher in elevation than creosote bush. Blackbrush is generally found on rocky highlands, alluvial slopes and bajadas (Thomas et al. 2004). An important plant species for bighorn in this management unit and commonly found in the Creosote and Mojave yucca shrublands is catclaw (*Senegalia greggii*). Catclaw is commonly found in and along washes and is an important food source for desert bighorn sheep in the hot, summer months. A large portion of the Rodman Mountains is covered by lava beds and offers very sparse vegetation.

## **Water**

Generally, water is extremely limited in the Mojave Desert. While that remains true in the Newberry, Rodman and Ord Mountains Management Unit, there is ample opportunity to improve natural water sources to increase water availability to desert wildlife.

The Newberry Mountains contain two natural water sources accessible to bighorn sheep. Kane Spring is managed by a private cattle company, and though the spring is adjacent to escape terrain, it is not typically used by bighorn sheep, possibly due to vehicle traffic or cattle use. Hidden Spring requires periodic management of brush overgrowth. Ord Mountain has four springs with the potential for bighorn use. Three of the springs and a stock (cattle) tank are known to be used by bighorn. An old well also has the potential to be used as a wildlife water source, but is not accessible to bighorn. East Ord Mountain does not have any known water sources. The West Ord Mountains have five potential springs, however, only Joker Spring has recorded bighorn use. This may be, in part, because the population does not appear to have expanded into the West Ord Mountains. Recent collar data has, however, documented short forays into the West Ord Mountains and this behavior may become more frequent if the population continues to expand. The Rodman Mountains are generally considered transitional habitat and perhaps their lack of reliable water sources reflect that. One known tenaja, a natural rock pool, is occasionally known to be used by bighorn. The year 2018 marked the first documented visit by bighorn to Sheep Spring. However, this spring does not provide consistent water, especially in the hot season when it is needed most. Lastly, it is unknown whether bighorn use Shooting Spring, although it, too, is an unreliable water source.

## **RANGE CONDITIONS**

Range conditions in the Mojave Desert vary considerably from year to year, season to season, and area to area, and are a function of the timing and amount of annual rainfall (Noy-Meir 1973). Thus, forage availability can vary both within and among years, and even within the management unit.

## **Livestock**

The Newberry, Rodman, Ord Management Unit contains two grazing allotments, the Ord Mountain allotment and the Stoddard Mountain allotment. The Ord Mountain allotment potentially permits the year-round grazing of up to 307 cattle and 8 horses. However, since 2005, the Ord Mountain allotment has been grazing only 20-30 head. As it happens, the desert bighorn population dramatically increased from 25-50 animals in 2001 (Epps et al. 2003) to over 200 animals in 2016 (Prentice et al. 2018). The Stoddard Mountain allotment permits the grazing of up to 800 domestic sheep from March 1<sup>st</sup>-June 1<sup>st</sup> of each year. This is an ephemeral allotment that permits up to 489 Animal Unit Months (AUMs) but depends on the presence of enough vegetation.

Although the lease currently states there are zero active AUMs, this may change in years of good rainfall.

Domestic goats and sheep are known to be kept on private property in Newberry Springs, an unincorporated community east of Barstow, and adjacent to the Newberry Mountains. Domestic livestock, such as sheep and goats, commonly carry organisms associated with pneumonia in bighorn sheep (Wild Sheep Working Group 2012). Due to the risk of transmission of these pathogens to naïve herds of bighorn sheep, domestic goats and sheep should be managed to maintain separation and minimize risk of spreading disease agents to bighorn sheep (Brewer et al 2014, Drew and Weiser 2017).

Private hobby farms may pose a threat if bighorn sheep approach and contact domestic livestock, or if domestic livestock manage to escape their enclosures. One such instance occurred in 2018 when two domestic goats were seen at a water source regularly used by desert bighorn sheep. In this instance, the goats stayed near the water source long enough to be removed.

### **Feral Animals**

No feral animals are known to inhabit the Newberry, Rodman and Ord Mountains Management Unit.

### **Habitat Improvements**

Several Wildlife Water Developments (WWDs) have been developed in the Newberry Mountains and just outside the unit boundary on the nearby military base. These WWDs were put in place to increase the availability of summer habitat within the management unit. These WWDs have been spearheaded by volunteers from the Society for the Conservation of Bighorn Sheep with support from employees from the local quarry, the Marine Corps Air Ground Combat Center Twentynine Palms, BLM and the Department.

Two WWDs have been added to the Newberry Mountains in an effort increase the availability of summer habitat. Outside of the unit boundary, two WWDs have been developed on the Marine Corps Air Ground Combat Center to encourage connectivity with the neighboring Bullion Mountains.

In recent summers the Newberry WWD has frequently gone dry, due to an increase in use and a decrease in efficiency of the check-dam currently responsible for filling the tanks. Ideally, the system collection and storage capacity should function to minimize water hauling efforts and provide a reliable water source for this growing population. This development would benefit from a retrofit and is likely a good candidate for modern rain mat WWD systems.

### **Other Human Influences**

Among important human influences on bighorn sheep inhabiting the Newberry, Rodman and Ord Mountains is the construction of Interstate Highway 40 in the early 1970s. Movement corridors between mountain ranges are important components of

bighorn habitat (Schwartz et al. 1986; Bleich et al. 1990, 1996; Epps et al. 2007). A historical account of a ram hit by a train near the Pisgah Crater in 1920 suggests historic movement between the Cady and Rodman Mountains or units nearby (Weaver and Mensch 1971); however contemporary genetic analyses (Epps et al. 2005) do not indicate gene flow across I-40. Genetic data (Epps unpublished data) and GPS data (Prentice et al. 2018) have documented geneflow and movement into the Bullion Mountains to the southeast.

Mining has occurred throughout the area beginning in the late 1800s (Weber 1963), and while many tons of ore have been mined from the Ord Mountains and Newberry and Rodman have been explored extensively, no significant mining production has been recorded (Cox et al. 1987). Two active quarries operate within the unit boundary. Limited hunting, primarily for Gambel's quail (*Callipepla gambelii*) or a variety of predators, may occur in the management unit. Limited recreational rockhounding also occurs there. All of these activities are compatible with the existing population of bighorn sheep. Vehicular access is limited to existing roads and trails by the Bureau of Land Management. Currently, no evidence exists that human infrastructure or use of the area present obstacles to the persistence of bighorn sheep within the management unit.

### **THE BIGHORN POPULATION DISTRIBUTION AND HABITS**

Historic distribution was described in a 1971 report as small bands of ewes on the northern slopes of Ord Mountain, old evidence of sheep use in the Newberry Mountains, and no evidence of use in the Rodman Mountains (Weaver and Mensch 1971). Recent aerial surveys, GPS collar data, and field observations, show bighorn sheep favor Ord Mountain and the Newberry Mountains, with some use on East Ord Mountain. Meanwhile, the West Ord Mountains appear to have very little use but recent GPS data suggests a slow expansion into the area may be occurring (CDFW unpublished data). The Rodman Mountains, however, do not see regular use by bighorn sheep and seem to serve as a transitional habitat for occasional forays or movements.

In December 2014, one collared, adult ewe made a week-long, 50 mile, journey from the Newberry Mountains to the Bullion Mountains, an adjacent range to the southeast (Prentice et al. 2018). Days later, a second adult ewe made the same trek, only starting on Ord Mountain; GPS locations from this ewe revealed a different path through the Rodman mountains but coalesced with the first ewe once in the Bullion Mountains. These forays began in early December and both ewes returned to their respective mountains in June. The same individuals repeated this movement pattern the following year, coinciding with the lambing season. Collar data were not available in 2016 or 2017, but one of the ewes was recollared in the fall of 2018 and was once again documented moving into the Bullions in early February of 2019 (CDFW unpublished data).

## **POPULATION DYNAMICS**

### **Population Size and Trends**

Historical data on population size and trends are limited. Weaver and Mensch reported severe overgrazing in the area and surmised that competition from cattle contributed to the decline of sheep in the unit (1971). In the same report, they recorded the population as extirpated after searching for a remnant herd. Prior to their extirpation only small counts of sheep were recorded in the area (Table 1). Torres et al. (1994) estimated the total of the combined populations at Ord and Newberry Mountains to be less than 50, Epps et al. (2003) grouped the two as one population and estimated that there were less than 50 bighorn sheep in the area. It is not known if or how the Ord and Newberry populations came to be reestablished in the area. One hypothesis may be that extremely low numbers of bighorn sheep in the unit were undetected during historic investigations and miscategorized as extirpated (Weaver and Mensch 1971). A second hypothesis is the vacant habitat was recolonized by a neighboring herd unit. Female bighorn sheep are typically reluctant to disperse from natal range (Geist 1967, 1971) making recolonization seem unlikely (Geist 1967, 1971), however GPS data mentioned above reveal ewes in the population making intermittent long-distance movements necessary to establish a population in the unit.

Contemporary management using a simultaneous double count method (Graham and Bell 1989) in the unit has revealed a robust population, perhaps benefiting from greater availability of forage due to reduced competition from cattle. A 2016 survey estimated 189 (95% confidence intervals of 174-239) desert bighorn sheep, and a 2018 survey estimated 256 (95% confidence intervals of 208-303) bighorn sheep within the unit.

### **Population Structure**

Historical records do not offer specifics about population structure. Available information indicates small populations, leading to extirpation, and then a resurgence of a small population to its current estimated size. The population growth may be attributed to the reduction of competition from cattle as mentioned above. A 2018 helicopter survey in the unit reveals high male to female ratios, 95:100, consistent with what is expected in populations with non-consumptive uses. The survey recorded a lamb to ewe ratio of 44:100, and yearling to ewe ratios of 33:100.

### **Mortality Factors**

#### *Diseases and Parasites*

Bighorn sheep were captured in the Newberry, Rodman and Ord Mountains as part of a range-wide disease response and surveillance effort beginning in 2013. Samples were collected from 18 bighorn sheep within the unit. To date, the population has tested free of *Mycoplasma ovinpneumoniae* (*M.ovi*), a bacterium associated with respiratory pneumonia in wild sheep and found in bighorn sheep in nearby management units. However, positive results for bovine respiratory syncytial virus (BRSV), epizootic

hemorrhagic disease virus (EHDV) and blue tongue virus (BTV) were obtained. Although no obvious signs exist that the diseases presently known limit bighorn sheep in the Newberry, Rodman and Ord Mountains Management Unit; the interactions between pathogens and population dynamics are often complicated and difficult to document. Given the prevalence of M.ovi in other neighboring bighorn herds and devastating effects, the Department close monitors the Newberry, Ord, and Rodman unit for disease-related mortalities.

#### *Predation*

No known records of mountain lions exist within the unit, nor do indications that predation poses a problem to the bighorn sheep in this management unit.

### **TRANSLOCATIONS**

To date, there have been no translocation efforts into or out of this management unit. Further, given the increase in population size and expansion of range within the unit, there is currently no need or intent to augment the population. If it is determined in the future that the population could sustain removal of desert bighorn to reestablish or augment other populations, the translocation strategy shall adhere to Departmental policies regarding such efforts.

### **RECOMMENDATIONS FOR ACHIEVING MANAGEMENT GOALS**

Section 4900 of the Fish and Game Code declares it ..."to be the policy of the state to encourage the preservation, restoration, utilization, and management of California's bighorn sheep population," and that "management shall be in accordance with the policy set forth in Section 1801" (of the Fish and Game Code). To fulfill that policy and to achieve management goals for bighorn sheep in the Newberry, Rodman and Ord Mountains Management Unit, the following recommendations are provided, though the degree and timing of their implementation by the Department may be influenced by human resource, fiscal and legislative constraints.

1. This bighorn population should continue to be monitored. Surveys should be conducted regularly to continue to develop information on population size and trends, structure, and rate of recruitment into the population. An effort should be made to develop a model that will be useful in projecting population size (Conner 2009, 2010) prior to conducting additional surveys. Following development of such a model, additional survey data will be necessary to validate and fine-tune any resulting model.
2. Approximately 201-300 bighorn sheep currently occupy the management unit. Given the population has been increasing in recent years and may continue to grow, the Department should determine appropriate population objectives while

considering factors such as the absence/reduction of grazing and the timing and amount of rainfall in the dynamics of this population.

3. Sex ratios, lamb:ewe, and yearling ratios should be recorded and monitored carefully. Abrupt changes in lamb:ewe ratios may suggest impacts from the onset of disease or other stressors.
4. Whenever bighorn sheep are captured in this management unit, appropriate samples should be collected for serological and other examinations to monitor incidence of diseases, parasites and, to the extent possible, changes in rates of infection. These results should be examined in the context of the status, condition, and productivity of the bighorn sheep population.
5. To minimize risk of introduced disease, efforts should be made to avoid contact between wild sheep and domestic sheep or goats.
6. Existing WWDs have likely played an important role in the growth and persistence of this population. These water sources must continue to be inspected at least twice a year, and necessary maintenance conducted to ensure availability of water continues uninterrupted. In the absence of any Department of Fish and Wildlife personnel assigned specifically to bighorn sheep habitat issues, inspections and maintenance may be conducted by volunteers affiliated with the Society for the Conservation of Bighorn Sheep.
7. Efforts should be made to keep the public informed of the status of this population, as well as management goals and activities. Information can be disseminated through the Department's public information officers, news releases, popular and technical articles, the Department's web site, publications, or other appropriate methods.
8. The Department should expand its cooperation with citizen groups that support and encourage sound management of bighorn sheep. The Department should continue to request assistance from interested citizens to conduct inspections, repairs, or improvements to existing water sources, with installation of new water sources, or when conducting surveys necessary for management of bighorn sheep. The Department has long-standing and successful relationships with several citizens groups dedicated to conservation of bighorn sheep and other wildlife, including the Society for the Conservation of Bighorn Sheep, Desert Wildlife Unlimited, and the California Chapter of the Wild Sheep Foundation. Continued participation of citizen groups is vital to successful management of bighorn in California.
9. In keeping with the overall policy of the California Department of Fish and Wildlife, this population should be considered in the context of its potential to provide recreational uses, including opportunities to harvest a limited number of mature males.

10. The management of bighorn sheep and their habitat within this unit shall be periodically updated in the biennial Desert Bighorn Sheep Status Report. The report may include: (a) results of aerial and ground surveys, distributional data, and age and sex composition of the population; (b) results of any capture or translocation efforts; (c) a report of water conditions, including any maintenance or improvements performed; (d) a summary of recent disease and parasite findings; (e) a summary of any telemetry or other research findings; and (f) a summary of any habitat disturbances, poaching incidents, harassment, or other factors that might be detrimental to the population, along with recommendations for management actions to correct any such problems.

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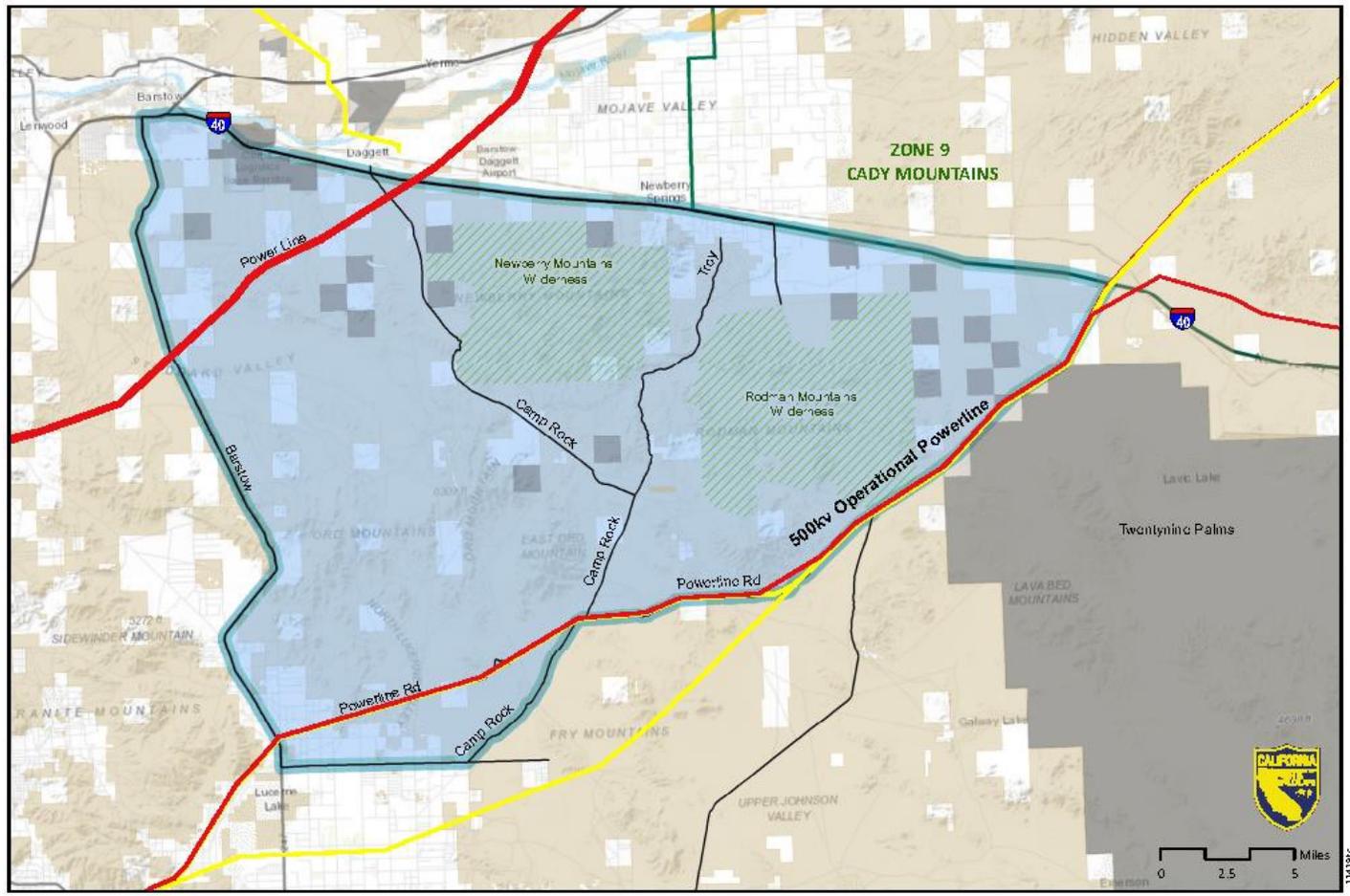
**Table 1: Number of Bighorn Sheep estimated to inhabit the Newberry, Rodman and Ord Mountains, San Bernardino County, California, 1957 – 2018**

Year	Estimated number of bighorn sheep	Authority
1957	0	F. Jones (Trefethen 1975)
1971	0	R. Weaver and Mensch (1971)
1988	<25	R. Clark (unpublished data)
1994	25-50	S. Torres (1994)
2001	25-50	C. Epps et al. (2003)
2011	101-150	R. Abella (2011)
2016	150-200	P. Prentice (unpublished data)
2018	201-250	P. Prentice (unpublished data)

**Table 2: Sex and Age Classification of bighorn sheep observed during aerial surveys in the Newberry, Rodman and Ord Mountains Management Unit, 1994 – 2018**

Date	Effort (Hours)	Lambs	Ewes	Yearling Ewes	Males				Unclassified	Total
					I	II	III	IV		
5/27/1994	4	1	12	3	0	2	1	2	0	21
10/6/2016	7	49	64	6	11	8	13	20	0	171
10/17/2018	5.7	35	79	16	10	14	20	28	2	204

**Figure 1: Boundaries of the Newberry, Rodman and Ord Mountains Bighorn Sheep Management Unit, San Bernardino County, California**



**NEWBERRY, RODMAN, AND ORD MOUNTAINS MANAGEMENT UNIT**

- |  |                                      |   |           |   |                             |
|--|--------------------------------------|---|-----------|---|-----------------------------|
|  | Newberry, Rodman, Ord Mtn. Mgt. Unit |  | U. S. BLM |  | Electric Transmission Lines |
|  | Wilderness Area                      |  | U. S. DOD |  | 200 - 230kv                 |
|  |                                      |  | CDFW      |  | 500kv                       |

# DRAFT ENVIRONMENTAL DOCUMENT

Section 362, Title 14, California Code of Regulations

Regarding



## Bighorn Sheep Hunting

SCH 2018112036



February 14, 2019  
STATE OF CALIFORNIA  
THE RESOURCES AGENCY  
DEPARTMENT OF FISH AND WILDLIFE  
On behalf of the FISH AND GAME COMMISSION

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## CHAPTER 1. SUMMARY

Existing law (Section 4902, California Fish and Game Code (FGC)) allows the Fish and Game Commission (Commission) to authorize sport hunting of mature Nelson bighorn rams in geographic areas for which management plans have been developed.

Section 4901 of the FGC directs the Department of Fish and Wildlife (Department) to develop management plans for each Nelson bighorn sheep unit. These plans guide conservation actions and support recreational harvest opportunities established by the Commission. Appendix 1 includes FGC sections pertinent to Nelson bighorn sheep management.

State law requires the Commission to review the mammal hunting regulations, and the Department to present its recommendations for changes to the mammal hunting regulations to the Commission at a public meeting. Mammal hunting regulations adopted by the Commission provide for hunting Nelson bighorn sheep in specific areas of the State (Section 362, Title 14, California Code of Regulations (CCR)). The full text of Section 362 with proposed changes appears in Appendix 2.

In adopting regulations for limited hunting of mature Nelson bighorn sheep rams, the Commission would implement Section 4902 of the FGC, which is consistent with the wildlife conservation policy adopted by the California Legislature (Section 1801, FGC). The State's wildlife conservation policy, among other things, includes an objective of providing hunting opportunities when such use is consistent with maintaining healthy wildlife populations.

### PROPOSED PROJECT AND ALTERNATIVES

The proposed project involves modifications to the current bighorn sheep hunting regulations for the 2019/2020 hunting season and continuing until the Commission adopts subsequent regulations modifying the tag limits. The tag limits will be consistent with statutory limitations (sections 4900 to 4904, FGC) on mature ram harvest within each hunt zone. Specifically, the Department proposes to:

- Increase the tag quota range in the Marble Mountains Zone by one tag, the Clark/Kingston Mountain Ranges Zone by two tags, and the White Mountains Zone by one tag

- Increase the individual tag quotas in other zones within previously analyzed quota ranges
- Establish a new hunt zone in the Newberry, Rodman, and Ord Mountains;
- Reallocate the Kelso and Old Dad Peak Fund-Raising Tag to the Cady Mountains Fund-Raising tag (see full regulatory text in Appendix 2).

In total, the project would increase the total availability of tags by ten, for a statewide total of up to 42 tags. Because final tag allocations are not established until survey results are completed and analyzed, the Commission, based on a recommendation from the Department, is evaluating a potential range of proposed hunting tag quotas. Upon completion of the aforementioned analyses, the Department will provide the Commission with an updated recommendation to evaluate as it makes a final decision on hunting tag allocations.

The Commission is also considering two alternatives to the proposed project that could feasibly attain the objectives of the project. Alternative 1 (no change) would maintain the existing tag quotas and zone without change. Alternative 2 (increased harvest) involves increasing tag quotas in the existing hunt zones by 50 percent. Current and proposed harvest strategies generally allow for continued population growth through time while remaining consistent with the statutory limitations. The Increased Harvest alternative may not affect population growth over time but would likely exceed the statutory limit of mature ram harvest in most hunt zones.

## SUMMARY OF IMPACTS AND MITIGATION

Table 1 summarizes Commission findings that there are no significant long-term adverse impacts associated with the proposed project or any of the project alternatives considered for the 2019 Nelson bighorn sheep hunting regulations.

**Table 1: Effects on the Environment of Limited Public Hunting of Bighorn Sheep**

<b>Alternative</b>	<b>Significant Impact</b>	<b>Nature of Impact</b>	<b>Mitigation Available</b>	<b>Nature of Mitigation</b>
<b>Proposed Project:</b> Modify number of tags, establish a new hunt zone, and reallocate a fund-raising tag	No	None	N/A	N/A
<b>Alternative 1:</b> No change	No	None	N/A	N/A
<b>Alternative 2:</b> Increased harvest of mature rams	No	None	N/A	N/A

It is anticipated the number of tags issued will fall near the upper end of the proposed ranges (Table 2). Given the low number of tags in each zone, the resulting harvest for 2019 will likely be similar to that of 2018. On a statewide basis, the total hunter harvest will likely exceed that of previous years due to high hunter success (generally approaching 100 percent), the increased number of tags and addition of one new hunt zone. Based on success rates from previous years, the actual harvest is anticipated to be approximately 95 percent of the bighorn sheep tags allocated for 2019.

**TRIBAL COORDINATION**

The Department is committed to developing and maintaining an effective, positive and cooperative relationship with California federally recognized Tribes (Tribes) regarding Nelson bighorn sheep management. In order to achieve the goals regarding California’s bighorn sheep populations, innovative management actions and collaboration will be required, and guidance from a statewide management plan (management plan) for Nelson bighorn sheep currently in development is necessary to help mediate competing and conflicting interests and assure the conservation, protection, restoration, enhancement and reestablishment of California’s bighorn sheep populations and habitat. This is critical to providing cultural, scientific, educational, recreational, aesthetic and economic benefits for present and future generations of Californians.

A letter to Tribal Representatives on November 7, 2018 provided notification of the Department’s proposal to amend hunting regulations for Nelson bighorn sheep pursuant

to the California Environmental Quality Act (CEQA), Public Resources Code Section 21080.3.1. The letter described opportunities to provide input to the proposed regulations through consultation pursuant to Public Resources Code sections 21080.3.1 and 21030.3.2, or during the public comment period for release of this Draft Environmental Document.

## AREAS OF CONTROVERSY

A Notice of Preparation was filed with the State Clearinghouse on November 13, 2018. Pursuant to Section 21080.3.1 of the California Environmental Quality Act (CEQA), in a joint letter, the Commission and Department informed Tribal Representatives of the proposed project. One Tribe has requested to review the Draft Environmental Document (DED).

Both the Commission and the Department have encouraged public input regarding the nature and scope of the environmental impacts to be addressed in the DED. The Department presented information on potential changes to bighorn sheep hunting regulations at the September 20, 2018 Wildlife Resources Committee (WRC) meeting held in Sacramento. A scoping session to discuss documents prepared in support of mammal hunting and trapping regulations was held in Sacramento, CA on November 30, 2018. No areas of controversy regarding nelson bighorn sheep hunting were identified at either meeting. Written comments have been submitted regarding specific hunting regulation changes (Appendix 3); no comments were received related to the scope of the analysis on environmental impacts under the CEQA.

## RESOURCE AREAS ANALYZED IN THIS DOCUMENT

This DED analyzes the potential for significant impacts to Biological Resources and Recreation, as well as Cumulative Impacts. After completing an initial study (Appendix 4), reviewing the comments received during the scoping period, and evaluating the potential environmental impacts of the project, the other resource areas were eliminated based on the Commission's determination that there was no potential for significant impact in those areas.

## ISSUES TO BE RESOLVED

As provided by existing law, the Commission is the decision-making body (lead agency) considering the proposed project, while the Department has the responsibility for conducting management activities, such as resource assessments, preparing management plans, operating public hunting opportunities, and enforcing laws and regulations. The primary issue for the Commission to resolve is whether to change Nelson bighorn sheep hunting regulations as an element of bighorn sheep management. If such changes are authorized, the Commission will specify the areas, seasons, methods of take, number of bighorn sheep tags to be allocated, and other special conditions.

## FUNCTIONAL EQUIVALENCY

CEQA requires all public agencies in the State to evaluate the environmental impacts of projects they approve, including regulations, which may have a potential to significantly affect the environment. CEQA review of the proposed project will be conducted in accordance with the Commission's Certified Regulatory Program (CRP) approved by the Secretary for the California Resources Agency pursuant to Public Resources Code Section 21080.5 (See generally CCR, Title 14, sections 781.5 and 15251(b)). The Department has prepared this DED, which is the functional equivalent of an Environmental Impact Report, on behalf of the Commission in compliance with this requirement. The DED provides the Commission, other agencies, and the general public with an objective assessment of the potential effects of the proposed action.

In addition, pursuant to Section 15087 of the CEQA Guidelines, this DED is available for public review for 45 days. During the review period, the public is encouraged to provide written comments regarding the environmental document to the Department of Fish and Wildlife, Wildlife Branch, 1812 9<sup>th</sup> Street, Sacramento, CA 95811. Comments must be received by the Department by April 5, 2019. This DED and any documents incorporated by reference will be available for inspection at: 1812 9<sup>th</sup> Street, Sacramento, CA 95811.

Written and oral comments received in response to the DED will be addressed in a Response to Comments document, which, together with the DED, will constitute the Final Environmental Document. In addition, the Commission will consider the comments

received pursuant to the Administrative Procedure Act addressing the proposed regulations. The rulemaking process under the Administrative Procedure Act to promulgate regulations is running concurrently with this environmental review pursuant to CEQA. Once completed, the Final Environmental Document will inform the Commission's exercise of discretion as lead agency under CEQA in deciding whether or how to approve the proposed project as described in this document and the proposed regulations.

## CHAPTER 2. THE PROPOSED ACTION

The Commission, based on a recommendation from the Department, is considering the following modifications to existing Nelson bighorn sheep hunting regulations.

1. Increase the Tag Range in the Marble Mountains Zone, the Clark/Kingston Mountain Ranges Zone, and the White Mountains Zone

In order to maintain management goals and objectives, it is periodically necessary to modify quotas in response to dynamic environmental and biological conditions. This proposed project modifies Nelson bighorn sheep tag ranges to account for fluctuations in populations of bighorn sheep (Table 2).

The increased tags will allow the Department to increase opportunity while providing a biologically appropriate harvest within the Marble Mountains, Clark/Kingston Mountain Ranges, and White Mountains zones. The new tag ranges would be 0-5, 0-4, and 0-6 respectively for the general draw hunts in those zones.

Section 4902, FGC limits the number of hunting tags for mature Nelson bighorn sheep rams to no more than 15 percent of the number of such males estimated to occur in each geographic area for which an approved management plan has been prepared. Annual population estimates are based on aerial surveys carried out by Department biologists, or on models developed from data obtained during those aerial surveys. Annual survey data or resulting models of population size upon which tag allocations are based are available from the Wildlife Branch, California Department of Fish and Wildlife, Sacramento, California.

2. Establish a New Hunt Zone

There are currently 9 bighorn sheep hunting zones in California. As a result of successful Nelson bighorn sheep conservation and management efforts in the Newberry, Rodman and Ord Mountains in San Bernardino County, a new hunt zone with a tag range of 0-6 is proposed. The new Nelson bighorn sheep hunt zone would be called the Newberry, Rodman and Ord Mountains bighorn sheep hunt and be added to the list of areas open to hunting of Nelson bighorn sheep (Figure 1). The number of tags (range 0-6) to be issued would be restricted to no more than 15 percent of the number of mature Nelson bighorn rams estimated to occur in the hunt zone, as stipulated by state law. Tags would be available to the general public during a season beginning on the first Saturday in December 2019, and continuing through the first Sunday in February 2020. This opportunity complies with sections 4900 to 4904 of the FGC and recommendations provided in a management plan for the Newberry, Rodman and Ord Mountains Unit, forthcoming in March 2019.

3. Reallocate a Fund-raising Tag

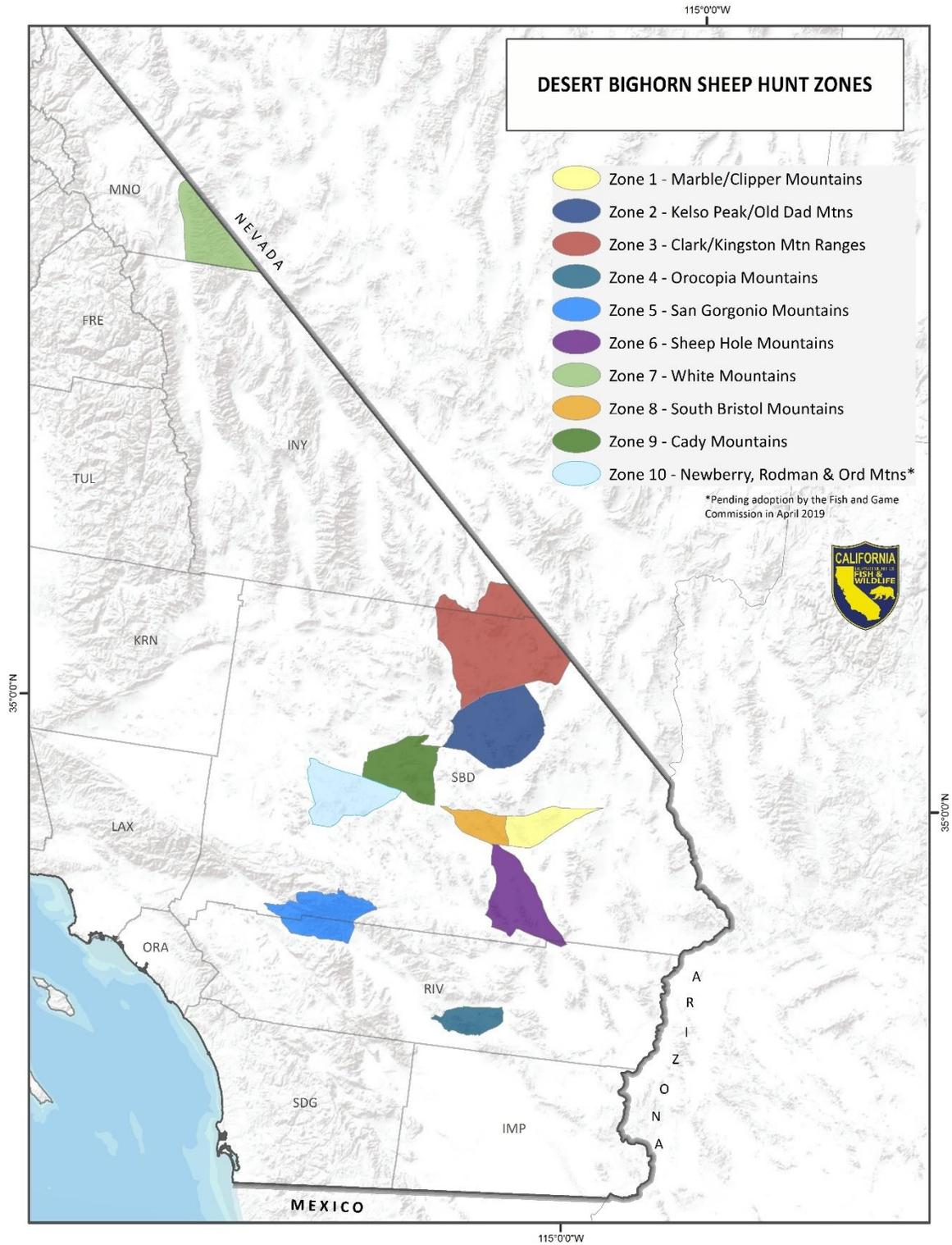
The proposed project would reallocate the Kelso and Old Dad Peak fund-raising tag to the Cady Mountains. This tag shall be valid from the first Saturday of November 2019 through the first Sunday of February 2020.

**Table 2: Proposed 2019 Tag Allocation**

Hunt Zone or Tag	2018 Tag Allocation	2018 Tag Range	2019 Tag Range (Proposed)
Zone 1 - Marble Mountains	4	0-4	0-5
Zone 2 - Kelso Peak/Old Dad Mountains	0	0-4	0-4
Zone 3 - Clark/Kingston Mountain Ranges	2	0-2	0-4
Zone 4 - Orocopia Mountains	1	0-2	0-2
Zone 5 - San Gorgonio Wilderness	2	0-3	0-3
Zone 6 - Sheep Hole Mountains	0	0-2	0-2
Zone 7 - White Mountains	3	0-5	0-6
Zone 8 - South Bristol Mountains	1	0-3	0-3
Zone 9 - Cady Mountains	4	0-4	0-4
Zone 10 - Newberry, Rodman, Ord Mountains (New)	-	-	0-6

Open Zone Fund-Raising Tag	1	0-1	0-1
Marble/Clipper/South Bristol Mountains Fund-Raising Tag	1	0-1	0-1
Kelso and Old Dad Peak Fund-Raising Tag	0	0-1	-
Cady Mountains Fund-Raising Tag (New)	-	-	0-1
TOTAL	19	0-32	0-42

**Figure 1: Desert Bighorn Sheep Hunt Zones**



## BACKGROUND AND EXISTING CONDITIONS

### *Historical Perspective of Bighorn Sheep Management in California*

Bighorn sheep existing today probably are the descendants of similar animals that entered North America via the Bering land bridge during the Illinoisan glaciation, at least 150,000 years ago (Cowan 1940, Geist 1970). Wild sheep spread across the glaciated mountains of western North America during the Sangamon interglacial period. The Wisconsin glaciation, 10,000 to 125,000 years ago, then separated the animals into two populations that persisted in unglaciated areas. Subsequently, Dall's sheep (*Ovis dalli*) evolved from populations in the Alaska-Yukon region, and bighorn sheep (*Ovis canadensis*) evolved in a region south of glaciated mountains and forests in what is now the continental United States (as summarized by Bailey 1980). Following the Wisconsin glaciation, wild sheep radiated into dry, mountainous terrain.

Geist (1971) tied the evolution of Asiatic and North American sheep to the expanding availability of favorable habitat, an occurrence concomitant with receding glaciers. The races, or subspecies, of *Ovis canadensis* currently recognized as desert bighorn sheep evolved from wild sheep that persisted in the southern region despite climatic changes. In part, they may have persisted because of the lack of competition with other large, native herbivores (Bailey 1980).

In California, bighorn sheep are found primarily in the southeastern part of the State in numerous Mojave and Sonoran desert mountain ranges. They also occur in several populations in the eastern Sierra Nevada; and, in three populations, in the Transverse Ranges of Ventura, Los Angeles, and San Bernardino counties. The probable historical and current distributions of bighorn sheep in California are illustrated in Figure 2.

Until recently, taxonomists have recognized three subspecies of mountain sheep in the state, including *O. c. californiana* (which was thought to occur throughout the Sierra Nevada and historically in northeastern California), *O. c. nelsoni* (which occurs throughout the majority of the Mojave and Sonoran deserts and in the transverse ranges of southwest California), and *O. c. cremnobates* (which occupied the peninsular ranges located primarily near the border with Mexico) (Cowan 1940). There have, however, been recent changes in nomenclature with respect to bighorn sheep inhabiting the Sierra Nevada and the peninsular ranges. Indeed, bighorn sheep occupying the

Sierra Nevada were designated *O. c. californiana* and are the only representative of that taxon; at the same time, all other wild sheep formerly designated as *O. c. californiana* were synonymized with *O. c. canadensis*, and are now recognized as the Rocky Mountain subspecies (Wehausen and Ramey 2000). Moreover, bighorn sheep inhabiting the peninsular ranges and formerly recognized as the subspecies *cremnobates*, were synonymized with *O. c. nelsoni*, and no longer are considered a distinct subspecies (Wehausen and Ramey 1993).

To further complicate nomenclature, Joseph Grinnell (1912) had assigned the subspecific epithet *sierrae* to those animals he described from the Sierra Nevada before Cowan (1940) published his revision of the taxonomy of North American mountain sheep and, obviously, before Wehausen and Ramey (2000) synonymized *californiana* with *canadensis*. Because sheep in the Sierra Nevada warrant subspecific recognition (Wehausen and Ramey 2000), judicious application of the rule of priority as it appears in the International Code of Zoological Nomenclature dictates that those animals are once again assigned to the subspecies *sierrae* (Wehausen et al. 2005).

Throughout much of the range occupied by bighorn sheep, the downward trend in numbers began with the human settlement of vast, uninhabited areas (Buechner 1960). Although a great deal of attention has been paid to the potential impacts of unregulated market hunting associated with the influx of gold mining during the 1850s (Buechner 1960) another likely factor was the introduction of livestock, primarily domestic sheep, throughout much of the range of bighorn sheep (Buechner 1960). Indeed, Francisco Garces, who chronicled the expeditions of Father Anza as he traveled from what is now Arizona north and west toward the Pacific coast of California, described dead and dying bighorn sheep in the Santa Rosa Mountains of southern California as early as 1776 (Bolton 1930). Garces described dead and moribund animals in association with livestock being herded northward by the Anza Expedition (Bolton 1930). Further evidence persists in the form of a legend among the Kaliwa Indians of Baja California, which describes a pestilence that killed many wild sheep in northern Mexico following the arrival of Spaniards and their livestock (Tinker 1978).

Historically, bighorn sheep were more numerous than they are today (Buechner 1960); a reasonable estimate for California is about 10,000 individuals in 1800 (Bleich 2006). These animals were distributed among approximately 100 populations at that time (Wehausen et al. 1987a).

In the decades immediately following the discovery of gold in California, several populations of bighorn sheep in the Sierra Nevada were eliminated, likely as a result of diseases contracted from domestic sheep that were grazed in that mountain range. The reduction in bighorn sheep, and wildlife populations in general, resulted in the first legal protection for bighorn sheep and other species of large mammals in California. At that time, it was believed that wildlife populations protected from hunting would flourish and recolonize former ranges and, in 1872, the California Legislature passed a law protecting deer (*Odocoileus hemionus*), elk (*Cervus elaphus*), and pronghorn (*Antilocapra americana*) for eight months of the year. In 1878, the Legislature amended the act to establish a four-year moratorium on the taking of any elk, pronghorn antelope, bighorn sheep, or female deer and, in 1883, the moratorium on taking bighorn sheep was extended indefinitely. In 1933, bighorn sheep became the first species in California to be classified as "fully protected" by the California Legislature (California Department of Fish and Game 2005a).

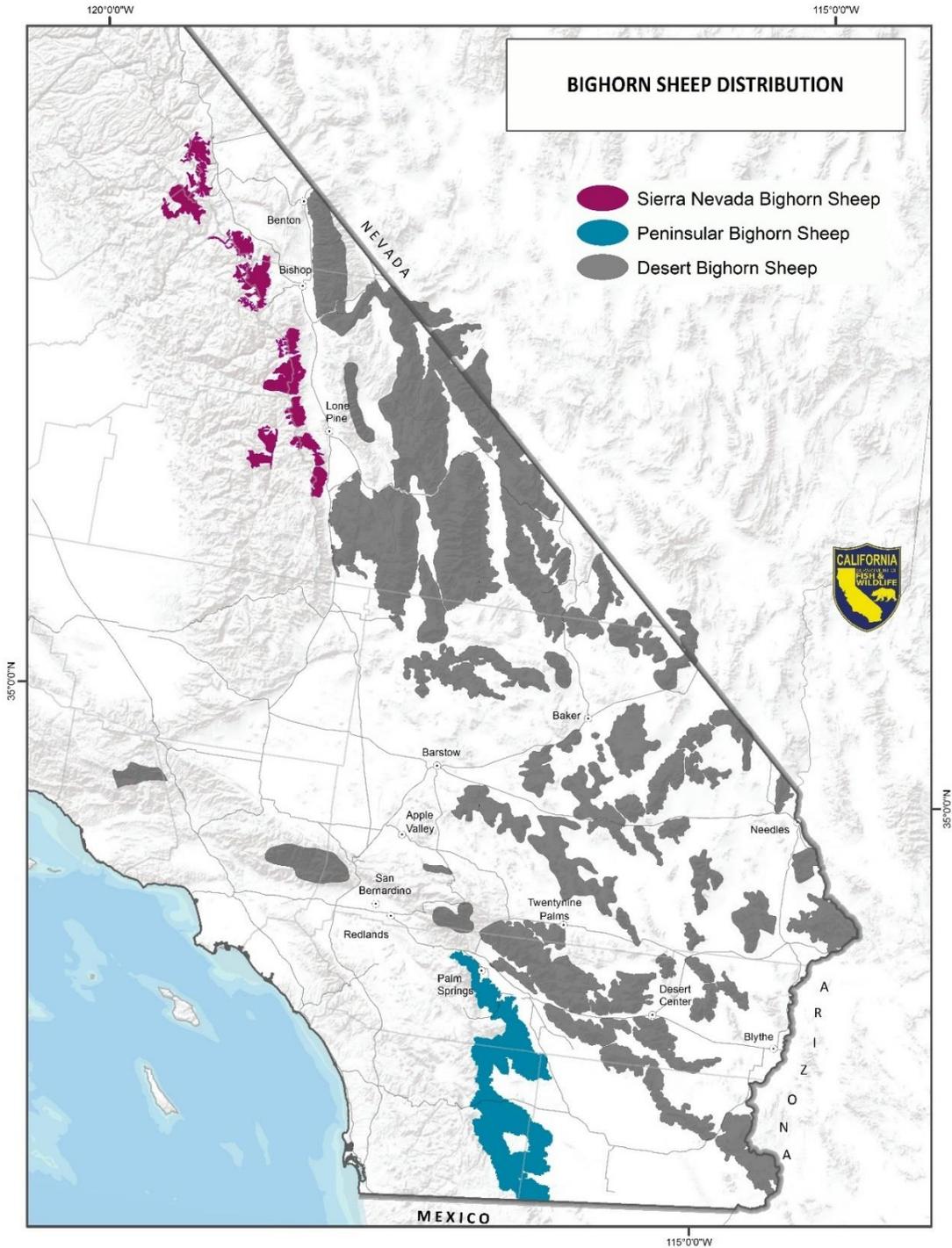
Despite the well-intentioned efforts of the California Legislature, total protection did not halt the loss of bighorn sheep in California (Wehausen et al. 1987a, Bleich 2006), and populations of bighorn sheep continued to disappear (Epps et al. 2003). Historic surveys and population estimates suggest that diseases, habitat changes, and competition for forage, rather than illegal take, resulted in the elimination of bighorn sheep in some areas, of which the most recent examples were the losses of translocated populations of bighorn sheep at Lava Beds National Monument in Siskiyou County (Weaver 1983), and in the Warner Mountains of Modoc County (Weaver and Clark 1988), both of which are thought to have resulted from respiratory disease contracted from domestic sheep in those areas (Foreyt and Jessup 1982, Weaver and Clark 1988).

### *Contemporary Management of Bighorn Sheep in California*

Currently, bighorn sheep occupy about 60 mountain ranges in California (Wehausen et al. 1987a, Abella et al. 2011); these populations are distributed primarily in the Sierra Nevada and desert regions of eastern and southern California (Epps et al. 2003). About 600 bighorn sheep occupy the Sierra Nevada, 800 occupy the peninsular ranges, and the remainder (about 4,000) occur in the transverse ranges, the Mojave Desert, and the Sonoran Desert. There are more populations than there are mountain ranges

supporting bighorn sheep, because some larger mountain ranges contain multiple populations based on distinct ranges of females (Bleich et al. 1996).

**Figure 2: Bighorn Sheep Distribution in California**



As a result of the aforementioned taxonomic and nomenclatural revisions, two subspecies of bighorn sheep currently are recognized in California. *Ovis canadensis nelsoni* occurs in suitable habitat in the Transverse Ranges, the Mojave Desert, and the Sonoran Desert; *O. c. sierrae* is restricted to the Sierra Nevada. Since 1998, bighorn sheep occupying the peninsular ranges have been afforded protection under the federal Endangered Species Act (U.S. Fish and Wildlife Service 2000), and bighorn sheep occupying the Sierra Nevada have been afforded similar protection since 2000 (U.S. Fish and Wildlife Service 2008). The California Fish and Game Commission has classified bighorn sheep inhabiting the peninsular ranges as threatened, and those inhabiting the Sierra Nevada are classified by the Commission as endangered.

Although the Department has supported an active management program for many years, contemporary management of bighorn sheep began with the passage of Senate Resolution 43 in 1963 (Bleich 2006). Input from interested conservation groups was instrumental in the passage of that resolution, which resulted in funding for the most detailed survey of bighorn sheep yet conducted in California; until that time, basic inventory data consisted only of cursory surveys that occurred in 1940, 1946, and 1957. Survey work completed during 1968-1972 as a result of Senate Resolution 43 yielded an estimate of 3,700 bighorn sheep in California (Weaver 1972). More importantly, however, was the fact that for the first time ever the management needs of bighorn sheep, including land-use conflicts, water developments, and re-introductions, were addressed.

As a result of management recommendations resulting from implementation of Senate Resolution 43, the Department of Fish and Game (now Fish and Wildlife) implemented an ambitious program to acquire habitat for bighorn sheep occupying the peninsular ranges. Additionally, the Volunteer Desert Water and Wildlife Survey (VDWWS) was founded to help carry out recommendations for water developments put forth by Weaver (1972), and to assist the Department with census efforts and other work related to bighorn sheep and other desert wildlife. Since 1970, volunteers have contributed thousands of hours of labor to the program, resulting in dozens of habitat enhancement projects directed specifically at conserving populations of bighorn sheep (Bleich et al. 1982, Bleich 1990).

An effort to reestablish bighorn sheep on historical ranges also occurred as a result of Senate Resolution 43. The first such effort took place in 1971 at Lava Beds National

Monument, and in 1980 a similar effort was initiated in the Warner Mountains. Both of those attempts ultimately were unsuccessful.

In 1979, translocation of California bighorn sheep from the Mount Baxter herd in the Sierra Nevada was initiated, largely as a result of research conducted by Wehausen (1979) in combination with recommendations by the Department (Leach 1974) that the subspecies be introduced to areas from which it had been eliminated. Since then, a total of 118 animals have been translocated, 108 of which were used to reestablish bighorn sheep populations in three areas of the Sierra Nevada: Wheeler Crest, Mount Langley, and Lee Vining Canyon or to augment other extant populations in that range, and 10 of which were translocated to the Warner Mountains of Modoc County, California. These translocations took place in 1979, 1980, 1982, 1986, 1987, 1988, 2001, 2005, and 2009.

In 1981, Assembly Concurrent Resolution 41 was passed and directed the Department to prepare a study plan to investigate population status, competition, diseases, and the potential to introduce bighorn sheep to historically occupied areas in California. Funding was allocated from the California Environmental License Plate Fund for the purpose of carrying out the investigations outlined by the Department's study plan (Weaver 1983).

In 1983, the Department completed a statewide management plan for bighorn sheep (California Department of Fish and Game 1983). The plan identified a number of specific management programs, designed to help meet statewide goals for the management and restoration of bighorn sheep populations. Goals specifically listed in the statewide plan are to: (1) maintain, improve, and expand bighorn sheep habitat where possible or feasible; (2) reestablish bighorn sheep populations on historic ranges where feasible; (3) increase bighorn sheep populations so that all races become numerous enough to no longer require classification as threatened or fully protected; and (4) provide for aesthetic, educational, and recreational uses of bighorn sheep. Aside from the specific recommendations of Leach et al. (1974) regarding California bighorn sheep, this was the first official Department document to advocate the reintroduction of all subspecies of bighorn sheep in California.

Subsequently, in 1983 a series of translocation projects involving Nelson bighorn sheep (*O. c. nelsoni*) from two large Mojave Desert mountain ranges began. To date, 230 animals have been removed from Old Dad Peak for translocation to the Whipple

Mountains, Sheep Hole Mountains, Eagle Crags, Argus Mountains, Avawatz Mountains, Chuckwalla Mountains, Bristol Mountains, and Bullion Mountains. A total of 55 animals have been removed from the Marble Mountains for translocation to the Whipple Mountains and Eagle Crags (Bleich et al. 1990, Torres et al. 1994).

By 1983, it was determined that the population of Nelson bighorn sheep in the San Gabriel Mountains was large enough to support removals for translocation (Holl and Bleich 1983), and in 1983, 1985, and 1987, a total of 71 animals were removed from winter ranges in the South Fork of Lytle Creek and Cattle Canyon. Those animals were translocated to a vacant, historical winter range in the Prairie Fork of the San Gabriel River (within the San Gabriel Mountains) and to historical habitat near San Rafael Peak, in Ventura County (Bleich et al. 1990). In 1988, 10 sheep were captured in Lone Tree Canyon of the White Mountains, Mono County, and translocated to Silver Canyon, also in the White Mountains, Inyo County. Since 1979, the Department has reestablished 11 new populations and augmented four small populations through translocation projects.

In 1986, the enactment of Assembly Bill 3117 (Chapter 745) created a series of laws which comprised the most significant legislation affecting bighorn sheep management in California since the 1878 legislation that established the initial moratorium on the taking of bighorn sheep. This law contained language that directed the Department to prepare management plans for each population of bighorn sheep in California. In addition, Assembly Bill 3117 differed from previous legislation that would have authorized hunting in that it: (1) made bighorn sheep a game mammal in only two areas (Old Dad Peak and the Marble Mountains); (2) provided for one hunting tag to be available for fund-raising purposes each year with the revenues from bighorn sheep hunting to be put in an account set aside solely for the benefit of bighorn sheep; (3) set a biologically conservative limit on the number of tags which could be offered each year, not to exceed 15 percent of the mature males counted annually in each population; and (4) contained an expiration date of December 31, 1992, unless the Legislature extended it beyond that date. In 1990, the Legislature removed the expiration date.

Implementation of Section 4902 of the FGC (Appendix 2) has involved hunting of a limited number of mature Nelson bighorn rams since 1987, when specific regulations similar to the proposed action were initially adopted by the Commission. Hunts have been conducted annually since then, pursuant to Section 362 of Title 14, CCR.

Assembly Bill 977 amended sections 4902 and 4903, FGC, and thereby (1) permitted the Commission to authorize hunting of Nelson bighorn rams in management units for which plans have been developed pursuant to Section 4901, FGC; (2) increased to three the permissible number of fund-raising license tags to be available for programs and projects to benefit bighorn sheep (the number of these authorized, if more than one, would not be permitted to exceed 15 percent of the total number of tags authorized generally); and (3) specified that any use of those revenues for the Department's administrative overhead shall be limited to the reasonable costs associated with direct administration of the program.

The Department's Bighorn Sheep Management Program is currently revising the statewide management plan for Nelson bighorn sheep in California. This planning effort will identify and prioritize actions to ensure the long-term viability of bighorn sheep populations, consistent with existing State policy. Protection of important habitats and inter-mountain movement corridors, identification of future introduction sites, and habitat enhancements will be addressed. The planning effort is occurring in cooperation with the Bureau of Land Management, California Department of Parks and Recreation, Department of Defense (Military), and National Park Service (NPS).

Intensive data collection continues to provide basic information for updating and preparing additional management plans, as required by the FGC. These efforts include assessing habitat and potential movement corridors, and surveys to estimate population sizes, age class structure, sex ratios, sampling individual animals for the prevalence of diseases and parasites, and implementing strategies to stabilize or enhance individual populations of Nelson bighorn sheep.

## EXISTING CONDITIONS

Regulated public hunting for Nelson bighorn sheep began in 1987 in California with passage of AB 3117, and has occurred without interruption since that date. Additional public hunts for Nelson bighorn sheep have been established subsequent to 1987 and annual hunts for Nelson bighorn sheep have been part of the existing conditions in California for the last 24 years. Appendix 1 lists the verbatim for the current and proposed conditions for hunting Nelson bighorn sheep in California.

## POLICY CONSIDERATIONS

The Legislature formulates laws and policies regulating the management of fish and wildlife in California. The general wildlife conservation policy of the State is to encourage the conservation and maintenance of wildlife resources under the jurisdiction and influence of the State (Section 1801 of the California Fish and Game Code). The policy includes the following objectives (which are also the objectives for this proposed project):

1. To provide for the beneficial use and enjoyment of wildlife by all citizens of the State;
2. To perpetuate all species of wildlife for their intrinsic and ecological values, as well as for their direct benefits to man;
3. To provide for aesthetic, educational, and non-appropriative uses of the various wildlife species;
4. To maintain diversified recreational uses of wildlife, including hunting, as proper uses of certain designated species of wildlife, subject to regulations consistent with the maintenance of healthy, viable wildlife resources, the public safety, and a quality outdoor experience;
5. To provide for economic contributions so the citizens of the State through the recognition that wildlife is a renewable resource of the land by which economic return can accrue to the citizens of the State, individually and collectively, through regulated management. Such management shall be consistent with the maintenance of healthy and thriving wildlife resources and the public ownership status of the wildlife resource;
6. To alleviate economic losses or public health and safety problems caused by wildlife; and
7. To maintain sufficient populations of all species of wildlife and the habitat necessary to achieve the above-stated objectives.

With respect to Nelson bighorn sheep, the Legislature has established the State's policy regarding management in sections 4900 to 4904 of the FGC (Appendix 2). Section 4900 declares that bighorn sheep are an important wildlife resource of the state to be managed and maintained at sound biological levels, and that it is the policy of the state to encourage the preservation, restoration, utilization, and management of California's bighorn sheep populations, and that such management shall be in accordance with the

policy set forth in Section 1801 of the FGC. Section 4901 directs the Department to determine the status and trend of bighorn sheep populations by management units, and to prepare plans for each of the management units. Each plan is to address (a) the numbers, age, sex ratios, and distribution of bighorn sheep within the management unit; (b) range conditions and any competition that may exist as a result of human, livestock, wild burro, or any other mammal encroachment; (c) the need to relocate or reestablish bighorn populations; (d) the prevalence of disease or parasites within the population; and (e) recommendations for achieving the policy objective of Section 4900.

Section 4902 provides that the Commission (a) may adopt all regulations pertaining to biologically sound management of Nelson bighorn sheep (*O. c. nelsoni*), including sport hunting of mature Nelson bighorn rams; (b) may not authorize permits in a single year within a single management unit in excess of the Department's annual estimate of the population in that management unit; (c) may determine the fee for a tag to take a Nelson bighorn ram, but restricts that amount to five hundred dollars; (d) shall annually direct the department to authorize not more than three of the tags available for issuance that year to take Nelson bighorn rams for the purpose of raising funds for programs and projects to benefit Nelson bighorn sheep, that those tags may be sold to residents or nonresidents for fund-raising purposes and shall not be subject to any fee limitation as described in Section 4902(c), specifies certain non-profit organization(s) as the seller(s) of not less than one of those tags if more than one fund-raising tag is authorized, restricts the number of fund-raising tags, if more than one, to no more than 15 percent of the total number of tags authorized to hunt Nelson bighorn rams in any given year, and mandates that all successful applicants complete a hunter familiarization and orientation conducted by the Department prior to hunting.

Section 4903 states that revenue from the sale of bighorn sheep tags for hunting Nelson bighorn sheep rams shall be deposited into the Big Game Management Account established in Section 3953 and, upon appropriation, shall be made available for programs and projects to benefit bighorn sheep and other big game as defined in that section.

### CHAPTER 3. POTENTIAL FOR SIGNIFICANT EFFECTS

Hunting of bighorn sheep will result in the deaths of individual animals. The removal of individual male animals from only 10 populations (Marble Mountains, Old Dad Peak/Kelso Mountains, Clark/Kingston Mountains, Orocopia Mountains, San Gorgonio Wilderness, Sheep Hole Mountains, White Mountains, South Bristol Mountains, Cady Mountains, and Newberry, Rodman and Ord Mountains) is not expected to significantly reduce herd size, or to affect the reproductive base of the population. The proposed action (modification of hunting tag ranges in three existing hunt zones, the addition of one hunt zone, and reallocation of one fund-raising tag) and adjusting tag quotas within previously analyzed tag ranges will result in maintaining these herds at or above approved management plan objectives and will maintain the ratio of male to female bighorn sheep at levels adequate to insure reproduction.

The approximately 60 herds of Nelson bighorn sheep in California occur from Mono County in the north, to the Mexican border in the south (Torres et al. 1996, Abella et al 2011). These populations are widely distributed, primarily throughout the southeastern part of the State and in the Sierra Nevada. Nelson bighorn sheep populations currently being considered in the proposed action, number about 4,000 and occur in Mono, Inyo, San Bernardino, Riverside, Ventura, Imperial, and Los Angeles counties. Ten hunting zones for Nelson bighorn sheep have been identified and cover only a portion of the entire range of Nelson bighorn sheep. Therefore, entire portions of the range and population will not be influenced by that activity.

Assuming the maximum number of tags is issued and all holders of bighorn sheep tags are successful, a maximum of 42 mature Nelson bighorn rams could be removed in 2019 from the statewide estimated population of 4,000 Nelson bighorn sheep. This short-term reduction of one percent of the total statewide population of Nelson bighorn sheep is well within the ability of the statewide population to maintain or increase in size over the long-term. The ability of bighorn sheep populations to experience a given level of hunting mortality without decreasing in health or vitality is described by Savidge and Ziesenis (1980) as sustained-yield management. It is reasonable that a removal of less than one percent of the statewide population is compatible with the long-term conservation of the subspecies. Thus, the removal of up to 42 mature male Nelson bighorn sheep is not expected to have a measurable impact on regional or statewide populations.

Pursuant to Section 4902, FGC, the number of tags allocated will not exceed more than 15 percent of the mature rams estimated in any management unit. Depending on the management unit, assessment of aerial or ground survey data will ensure that harvest will not exceed 15 percent of the mature rams in each management unit, as provided for by State law.

Before taking action regarding this proposal, the Commission will consider Nelson bighorn sheep populations, social structure, genetics, habitat, food supplies, the welfare of individual animals, impacts to other wildlife and plant species, impacts to recreational opportunities, public safety, the potential for cumulative impacts, and other pertinent facts and testimony. Although not a resource category where CEQA requires analysis, for informational value the Commission has also analyzed the potential for effects on economics from the proposed project. Each of these areas is discussed in more detail below.

## THE SPECIES

### *Population*

Under the proposed hunting programs, it is expected that a segment of the mortality previously identified as "natural" mortality will be shifted to hunting mortality. To a degree, hunting mortality will be substituted for, rather than added to, natural mortality. This follows the concept of compensatory mortality as described by Peek (1986) who noted that, "If hunting is a compensatory form of mortality then populations may be presumed to fluctuate in response to other factors, and stocks are little affected by exploitation. However, if hunting is additive to other forms of mortality then it serves as a depressant."

According to the concept of compensatory mortality, the production and survival of young animals within each population are ultimately expected to replace the animals removed by hunting. At the low level of proposed harvest, when combined with differential use of habitats by males and females during the birthing season (Bleich et al. 1997), influences of compensatory mortality are not expected to be measurable. Ongoing long-term demographic research on bighorn sheep populations has identified the primary factors influencing the abundance of those specialized herbivores. Given

the importance and significant variation in annual precipitation in these desert ecosystems, and the associated variation in diet quality, density-dependent mechanisms are difficult to observe (Wehausen 1992), but increased recruitment of young should compensate for increased rates of death resulting from harvest.

Since the hunting of Nelson bighorn sheep will occur, at most, in only ten of the State's approximately 60 populations of bighorn sheep under the alternatives considered, the removal of individual animals is not expected to have a significant effect on the statewide population of bighorn sheep. The existing populations of bighorn sheep in California are geographically separated and widely distributed, yet capable of moving among and between mountain ranges (Bleich et al. 1996). Therefore, the proposed action of providing opportunities to harvest up to 6 mature male Nelson bighorn sheep in the Newberry, Rodman and Ord Mountains, where a minimum of 62 mature males are estimated to occur, and an increase of 23 tags to the total potential statewide harvest, for a maximum of up to 42 mature Nelson bighorn rams from an estimated population of 4,000 total Nelson bighorn sheep will not have a significant adverse impact on any specific population to be hunted or on the statewide population of bighorn sheep.

The Department is committed to long-term demographic investigations of bighorn sheep populations. This research is particularly important in management units for which individual bighorn sheep are removed for translocation or harvest. To facilitate this research, animals have been telemetered and monitored in each proposed hunt zone.

The Department annually conducts fall/winter aerial surveys to count bighorn sheep within the majority of the management units being considered in this assessment, and ground counts are conducted during summer in the White Mountains Management Unit (Appendix 5). These surveys result in minimum population estimates, because many animals are missed during such surveys. Several published articles (Caughley 1974, Samuel et al. 1987, Graham and Bell 1989, Bodie et al. 1995, Bleich et al. 2001, Bernatas and Nelson 2004) have demonstrated that significant portions of populations being surveyed using aerial census techniques are not observed because of "visibility bias".

In some of the proposed hunt zones, aerial survey data are supplemented with independent ground surveys to record numbers of marked and unmarked sheep, which

are used to generate additional information on population size. This synthesis of data has made it possible to accurately assess the changes in bighorn sheep numbers, ratios of males to females or young to females, and to monitor the impacts of hunting and relocation (Wehausen 1992). Additionally, these aerial and ground survey results are used to determine tag allocations, and to ensure the proposed harvest does not exceed 15 percent of the mature rams in any of the respective management units.

Tag allocations have historically been determined by computing 15 percent of the mature rams observed during the annual surveys. These data are used to modify the range of tags to be allocated to ensure no more than 15 percent of the minimum number of mature males known to be present are harvested. The results of such surveys represent the minimum number of bighorn sheep, including mature males, present in a given population, and result in under-estimates of the true population of males and the total population. This procedure will continue to be used to generally assign tag allocations.

Independent estimates of population size and demographic parameters of bighorn sheep populations are derived using a combination of aerial census and ground observations of marked and unmarked animals in the hunt zones, and intensive ground surveys are conducted in the White Mountains. Wehausen (1990) and Jaeger et al. (1992) refer to this method as Multiple Direct Sampling (MDS). This method estimates population parameters from cumulative (or repeated) surveys that record the number of marked and unmarked animals observed, and assumes binomial sampling probabilities with replacement (Wehausen 1992).

### *Social Structure*

Bighorn sheep demonstrate pronounced sexual segregation (rams and ewes separate) during the majority of the year (Bleich et al. 1997). During periods of segregation, competition between the sexes for food and water is limited or nonexistent. In order for density-dependent responses to occur, a reduction in competition between males and females and the offspring of those females must occur if the population size is limited by the habitat. The removal of so few rams, that likely do not compete with females and young to any appreciable extent, is unlikely to result in substantial increases in recruitment of young animals into any population. Nevertheless, enhanced body condition among males, decreased consumption of available resources by bighorn

sheep throughout the management unit, and decreased energetic costs resulting from fewer potential interactions among mature males, would be among the compensatory responses expected to occur as a result of the removal of less than 15 percent of mature Nelson bighorn rams from any particular hunt zone, as specified by State law.

The proposed action has the potential to increase the current hunter harvest by one ram each in the Marble and Clipper Mountains, and White Mountains, and by two rams in the Clark and Kingston Range, as well as establish a new hunt zone in the Newberry, Rodman, and Ord Mountains with up to six tags (up to 10 additional tags in four hunt zones). The additional harvest in the existing zones and new harvest on a previously unharvested population may alter the ratio of males to females in each of those zones. It is unlikely, however, that the proposed action will affect the survivorship of young in those populations, given that males and females live separately for the majority of the year. Moreover, removal of 55 bighorn sheep from the Marble Mountains for translocation during 1983-85 did not result in measurable responses in recruitment rates (Wehausen 1988). Thus, it is unlikely that the removal of a small number of males from the proposed hunt zones will result in a detectable increase in recruitment rates of young.

### *Genetics*

Apollonio et al. (1989) reported that the removal of the majority of successfully breeding males from a population of lek-breeding fallow deer (*Dama dama*) resulted in a decrease of the overall productivity of the lek. Byers and Kitchen (1988) reported that in pronghorn (*Antilocapra americana*), the deaths of all mature males during a severe winter storm was followed by a mating system change from territoriality to harem defense, apparently because no males were sufficiently dominant to exclude other males from a territory. Speculation regarding the removal of large, old males of bighorn sheep, a species in which males form a tending bond with estrous females, thus warrants some consideration (Festa-Bianchet 1989).

It has been hypothesized that harvesting older males may remove the “best genes” from populations of bighorn sheep subject to “trophy hunting”. Fitzsimmons et al. (1995) reported that horn growth was higher males with greater genetic diversity, or heterozygosity, than less heterozygous rams for the 6<sup>th</sup>, 7<sup>th</sup>, and 8<sup>th</sup> years of life, and that by the end of the 8<sup>th</sup> year males exhibiting the greatest heterozygosity had higher horn volumes than males exhibiting lower heterozygosity.

The unregulated harvest of male bighorn sheep from a small, isolated population of Rocky Mountain bighorn sheep reportedly resulted in significant declines in body size and horn size (Coltman et al. 2003). Moreover, severe rates of selective harvesting (that are unlikely to be implemented by management agencies) potentially elicit an undesired evolutionary response when the targeted trait is heritable, as are size of horns or antlers (Hartl et al. 1991, 1995; Williams et al. 1994, Lukefar and Jacobson 1998, Kruuk et al. 2002). Nevertheless, the only example demonstrating the negative effects of selective harvest of ungulates in North America is that of Coltman et al. (2003), who investigated this phenomenon at Ram Mountain, Alberta, Canada. That population of Rocky Mountain bighorn sheep was small and isolated, but harvest was regulated only by a 4/5 curl regulation, and hunter opportunity essentially was unlimited. As a result, nearly every male was harvested upon attaining legal size, thereby allowing males with slow-growing horns to reach older age classes and do a disproportionate amount of the breeding. As a result, Coltman et al. (2003) concluded that the harvest rate in their study population resulted in selection against the fastest growing males before they reached their reproductive peak, and thereby reduced their genetic contribution to the population. Conversely, Coltman (2008) recognized that the selective effect reported by Coltman et al. (2003) may have been overestimated because it was not possible to account for the confounding effects of changes in population density during their study, a phenomenon that affected nutrient availability among animals in that population. Garel et al. (2007) concluded that selective harvest in a bottlenecked and genetically mixed population of mouflon (*Ovis* spp.) reduced the reproductive contribution of males that possessed a horn conformation desirable to hunters, which ultimately resulted in a selective advantage for smaller-horned males in that population. Neither of the situations described by Coltman et al. (2003) or Garel et al. (2007) are applicable to the harvest of bighorn sheep in California because of the very limited (less than 15 percent) potential harvest of mature males resulting from carefully regulated hunting opportunities.

Despite these observations, selection of large males by hunters may facilitate copulations by younger, smaller-horned males that may not encounter breeding opportunities in the presence of larger males (Hogg 1984). Resultant breeding by subdominant, smaller-horned males has the potential to increase the ratio of effective population size to census population size and, thereby, the potential to increase total genetic diversity within some populations (Singer and Zeigenfuss 2002). The effect of

an increase in the ratio of effective population size to census population size would, thus, offset the potential effects of the removal of some dominant males.

The consequences of declines in genetic diversity have also been questioned with respect to their demographic influences. Nevertheless, bighorn sheep that have been severely impacted by population bottlenecks and have resultant low genetic diversity appear not to be impacting the potential of those populations to recover in size (Wehausen and Ramey 2004). In contrast to the essentially unlimited harvest rates described by Coltman et al. (2003), harvest proposals considered in this document are extremely restricted, and remove but a very small proportion (less than 15 percent) of the minimum number of mature males from any single population, and less than 1 percent of the statewide population as a whole. As a result, the limited harvests proposed by the Department will not result in the small population sizes described by Wehausen and Ramey (2004).

Geist (1971) suggested that, if mortality of older males was related to rutting activity, younger males should be expected to suffer greater mortality if allowed to participate in the rut because of the absence of older males. Indeed, Heimer (1980), Heimer et al. (1984), and Heimer and Watson (1986) suggested that the removal of older and larger males by hunters would result in lowered survival of young males. Moreover, Heimer et al. (1984) reported that natural survival of Dall's sheep (*Ovis dalli*) males aged four to eight years was lower in areas with greater hunting pressure and a less restrictive definition of legal males.

In a specific test of Heimer's predictions, Murphy et al. (1990) reported no support for the hypothesis that reducing the number of older males had an adverse effect on the survival rate of young males. Similarly, other studies of *Ovis spp.* (Stewart 1980, Hoefs and Barichello 1984) have failed to demonstrate evidence of depressed survival of young rams in heavily hunted populations. The strongest support for the hypothesis is Heimer et al.'s (1984) study of the high rate of disappearance of young rams that had been trapped and marked, and were part of a hunted population. Murphy et al. (1990) concluded, however, that the disappearance of those young rams could be explained by dispersal and reduced sightability, rather than by reduced survivorship. Males tend to move over larger areas than do females, and their absence in areas they occupied as lambs does not mean they died. Further, Whitten (2001) concluded that sheep harvest trends were driven largely by weather patterns that affected sheep productivity, survival,

and abundance, rather than by horn curl regulations. In populations of Rocky Mountain bighorn sheep and desert bighorn sheep in which removal rates were carefully regulated and very low, Singer and Zeigenfuss (2002) concluded that young rams did not expend greater energy than young rams in non-hunted populations. Those authors concluded that there was no detectable effect on survivorship of those young rams and that harvesting of mature males did not lower survivorship of young males.

In the ten populations under consideration in the project, low harvest rates proposed should not disrupt the age structure and, hence, the social structure of these populations. An analysis of the hunter harvest indicates that the average age of all rams taken through the 2016/2017 hunting season was approximately 7 years. This mean age is lower than the life expectancy of a desert bighorn sheep, suggesting that harvests are not particularly concentrated on the oldest or largest males; hence, selective removal of the fastest growing males is an unlikely consequence of the limited opportunities being proposed.

The extremely conservative harvest rates in populations dominated by mature males have likely precluded any shift in the age structures or genetic diversity of these populations. An increase of up to 23 tags from current levels of hunting is not anticipated to have any impact on the age structure of the populations. Even with the combined removal of up to 42 mature Nelson bighorn sheep rams from ten proposed hunt zones, and with a maximum potential of 7 in any single zone, no changes in the age structure of the populations are anticipated, nor are any other adverse effects.

### *Habitat*

As proposed by the project, the removal of up to 42 rams will slightly reduce the total number of bighorn sheep in each of the hunt zones, as well as the statewide population, until the birth of young the following spring. Under the proposed regulations, the maximum number of bighorn sheep that could be removed from any single zone is seven (the Open Zone fund-raising tag may potentially remove a ram from this zone), and that take would be limited to the Newberry, Rodman and Ord Mountains. The maximum number of mature male Nelson bighorn sheep that could be removed from any other zone ranges from three to six, and would only reflect an increase of two to four rams above current levels of hunting. Those rates of harvest could yield slight improvement in habitat conditions, particularly in areas of those hunt zones that are

utilized primarily by adult males. It is unlikely, however, that any substantial improvement in habitat conditions will result, nor that any increase in recruitment rate, will be realized. The maximum number of mature Nelson bighorn rams that would be removed during the 2019 hunting season would be 42. The proposed removal rate and the distribution of animals to be removed among 10 separate hunt zones is expected to be too low to result in any measurable change in habitat conditions.

Wehausen et al. (1987b) demonstrated a strong relationship between precipitation and recruitment rates in a Sonoran Desert bighorn sheep population. Similarly, Monson (1960) noted the relationship between precipitation and bighorn sheep populations. Beatley (1974) emphasized the relationship between precipitation and phenological events in Mojave Desert ecosystems, and Wehausen (1988, 1990) noted the apparent relationship between high recruitment in the Marble Mountains in the late 1970s and early 1980s and levels of precipitation. Thus, it is likely that timing and amount of precipitation, rather than population levels of bighorn sheep, are the primary factors determining habitat conditions in the proposed hunt zones.

A maximum of 42 hunters, their guides, and selected individuals will participate in the bighorn sheep hunt. Given the low densities of human use, any habitat loss and degradation attributable to the proposed project would be negligible. Therefore, the cumulative environmental impact of habitat loss and the proposed project will not be significant

#### OTHER WILDLIFE AND PLANT SPECIES

The results of the Department's previous determination that no significant impacts would be incurred by other wildlife or plant species as a result of bighorn sheep hunting, as published in the Environmental Document for Bighorn Sheep Hunting (California Department of Fish and Game 2005b) are hereby incorporated by reference. Several plant and wildlife species listed as threatened or endangered can be found within the proposed project area. Because these areas are open year-round for public uses not limited to hiking, horseback riding, camping, hunting, photography, and bird watching, the low number of bighorn sheep hunters resulting from the proposed project is unlikely cause impacts to sensitive plant and wildlife species.

## RECREATIONAL OPPORTUNITIES

### *Hunting Opportunities*

The proposed action would authorize up to 23 additional tags, for a maximum of 42 opportunities for hunters to participate in this unique outdoor experience. This will be the 33rd such hunt in as many years. The demand for bighorn sheep hunting opportunities in California, and worldwide, is extremely high, as described in the Environmental Document for Bighorn Sheep Hunting (California Department of Fish and Game 2005b), and hereby incorporated by reference.

In 2018, all applicants for bighorn sheep tags paid a \$7.50 nonrefundable application fee to enter a drawing, and they must possess a California hunting license. Additionally, a total of approximately \$ 8.4 million has been received through the auction of fundraising tags from 1987 to 2018. The proposed action will positively impact the hunting public of the State by providing hunting opportunities consistent with sections 203.1 and 4902, FGC, and the State's wildlife conservation policy in Section 1801 of the FGC, and will provide funds specifically for conservation and restoration of bighorn sheep in California, consistent with sections 4902 and 4903 of the FGC.

As noted in the Environmental Document for Bighorn Sheep Hunting (California Department of Fish and Game 2005b) and incorporated herein by reference, there will be overlap of upland game (quail and chukar), rabbit, predator, and deer hunting seasons in two additional hunt areas for a portion of the year. However, due to the low numbers of sheep hunters in each area, coupled with the large areas open to hunting, it is unlikely that sheep hunters will affect the success or quality of the experience for hunters of other species of wildlife.

Because it would increase the hunting opportunity, the proposed project is not anticipated to have a significant impact on recreational hunting opportunities.

### *Nonhunting Opportunities*

As noted in the Environmental Document for Bighorn Sheep Hunting (California Department of Fish and Game 2005) and incorporated herein by reference, the non-

hunting users of the bighorn sheep resource (viewing, nature study, research, photography) are not expected to be significantly impacted by the hunting of mature bighorn sheep rams, including Nelson Bighorn Sheep (in the peninsular ranges, transverse ranges, the Mojave Desert, and the Sonoran Desert) and Sierra Nevada bighorn sheep, from a statewide population that now numbers approximately 5,400 animals. The proposed action is not expected to impair the ability of non-consumptive users to enjoy the outdoors, the bighorn sheep resource or its habitat because the non-hunting user will have opportunities to view bighorn sheep in un hunted situations indefinitely. No populations of bighorn sheep occurring in the other mountain ranges will be exposed to sheep hunting as a result of this project and, as a result, opportunities for non-hunting uses of those populations will not be affected.

## ECONOMICS

Under the proposed alternative, hunters from outside the local areas would continue to visit the region and purchase goods and services from local merchants. This additional spending will generate retail sales, income, and possibly employment in businesses such as motels, restaurants, and retail stores. Spending effects would be minor, because of the small number of tags sold. Any potential effects would likely be distributed among those communities located nearest to the sheep hunt areas, including Barstow, Baker, Blythe, Cadiz, Ludlow, Indio, Morongo Valley, Desert Center, Needles, Twenty-Nine Palms, and Amboy, in Riverside, San Bernardino, Inyo, and Imperial counties. These economic effects are likely to be an insignificant positive effect on the communities. More detail is available in the Environmental Document for Bighorn Sheep Hunting (California Department of Fish and Game 2005b).

## PUBLIC SAFETY

Since 1987, the Department has not received reports of bighorn sheep hunting related casualties in California, as discussed in the Environmental Document for Bighorn Sheep Hunting (California Department of Fish and Game 2005b) and incorporated herein by reference. As with any outdoor activity, there is always risk of injury or death, however the probability of being injured while bighorn sheep hunting is extremely low. This good safety record is due, in part, to the requirement that all hunters must successfully pass a hunter safety education course prior to receiving a license. Since completion of the 2005 Environmental Document for Bighorn Sheep Hunting (California Department of

Fish and Game 2005b) the Department has not received any reports of sheep hunting related casualties in California. The Commission does not anticipate any significant adverse impacts to public safety with the proposed project

#### SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

The proposed project allows an increase of up to 23 bighorn sheep hunters, bringing the potential harvest to a total of 42 animals distributed across 10 hunt zones, assuming the maximum number of tags is allocated. As noted in the Environmental Document for Bighorn Sheep Hunting (California Department of Fish and Game 2005b) and incorporated herein by reference, this short-term use could enhance long-term productivity by reducing competition for forage. However, given the extremely limited harvest, any reduction in intraspecific competition would be negligible and likely undetectable.

If the proposed project were delayed for any reason, no significant long-term impact on the population would be expected. However, this delay would eliminate the proposed allocation of additional hunting opportunities as per the Department's bighorn sheep management program and would not address the high demand for more recreational hunting opportunities involving bighorn sheep or be consistent with State policy regarding bighorn sheep management, or with project objectives.

The proposed increase of 23 tags, for a maximum of 42 mature Nelson bighorn sheep rams removed by hunting will not have a significant long-term adverse impact on either the specific populations to be hunted or on the statewide population of bighorn sheep.

#### CHAPTER 4. CUMULATIVE IMPACTS

The Commission could consider and may approve additional hunts in the future. The Commission has concluded that there will be no significant adverse cumulative effects on the State's Nelson bighorn sheep resource if the proposed project is implemented. The statutorily mandated regulation process involves review at least once every three years, Proposed recommendations for regulatory changes would be presented by the Department to the Commission along with supporting data and analysis prior to consideration of any future hunt. As with potential changes to hunting regulations for

deer, elk, and pronghorn antelope, the Commission receives recommendations regarding mammal hunting regulations from Commission members, its staff, the Department, other public agencies, and the public. More detail on this analysis is contained in the Environmental Document for Bighorn Sheep Hunting (California Department of Fish and Game 2005b) and incorporated herein by reference.

## HABITAT LOSS OR DEGRADATION

As noted in the Environmental Document for Bighorn Sheep Hunting (California Department of Fish and Game 2005b) and incorporated herein by reference, the proposed project, in combination with current bighorn hunts and other factors, is not likely to cause habitat loss and degradation. Changes in habitat are not expected to be significant in the project areas in the foreseeable future, as many of the designated hunt zones and part of the proposed new hunt zone are within wilderness areas. Areas designated as wilderness have their habitat protected in perpetuity, or until Congress determines other values exceed those associated with wilderness classification

## DROUGHT

As noted in the Environmental Document for Bighorn Sheep Hunting (California Department of Fish and Game 2005b) and incorporated herein by reference, drought can have an impact on local populations of bighorn sheep, and droughts are a natural occurrence faced by bighorn sheep throughout their evolutionary history. Further, drought conditions are generally localized, both spatially and temporally. The removal of an additional 23 mature Nelson bighorn sheep rams, for a maximum of 42 rams, would, in fact, decrease competition among males for available forage within hunt zones, but the effects of such a reduction in competition would be difficult to detect. The possibility of drought impairing the bighorn sheep population on a statewide basis is unlikely. It is anticipated that the statewide population will remain in a healthy, viable condition, even though dynamic weather patterns may affect some populations in some years. Therefore, the Commission does not anticipate any significant adverse cumulative impacts resulting from drought.

## WILDFIRES

As noted in the Environmental Document for Bighorn Sheep Hunting (California Department of Fish and Game 2005b) and incorporated herein by reference, the sparse vegetation and lack of fuel in bighorn sheep habitat makes it unlikely that wildfires have the potential to adversely affect bighorn sheep in the majority of the hunt zones. However, the San Geronio Wilderness occurs in an area of potential wildfires. Most research has shown burning, especially prescribed burning, to be favorable to bighorn sheep and deer. These fires maintain movement corridors, escape terrain, and provide new herbaceous vegetation, which is higher in nutrition than decadent vegetation and, ultimately, enhance nutrient availability to animals foraging in newly burned areas. Therefore, the Commission does not anticipate any significant adverse cumulative impacts resulting from wildfires.

## DISEASE, ROAD KILLS AND OTHER MORTALITY

As noted in the Environmental Document for Bighorn Sheep Hunting (California Department of Fish and Game 2005b) and incorporated herein by reference, no data available indicate road kills, disease, predation, or natural mortality factors will act as additive impacts which, along with the mortalities associated with the limited hunting program, will have significant adverse cumulative impacts on local, regional or statewide bighorn sheep populations. The Commission does not anticipate any significant cumulative impacts resulting from disease in combination with the proposed hunting project.

## ILLEGAL HARVEST

As noted in the Environmental Document for Bighorn Sheep Hunting (California Department of Fish and Game 2005b) and incorporated herein by reference, illegal take does not appear to be a significant factor affecting the population. The Department has documented annually approximately one to three cases of bighorn sheep being killed illegally statewide. The verified illegal take involves an extremely low proportion of the State's approximately 5,400 bighorn sheep and is widely distributed. Illegal take does not appear to be a significant factor affecting the population and, even with the potential harvest of up to 42 bighorn sheep statewide, the cumulative impacts of illegal harvest are not expected to be significant. Since the bighorn sheep outside the hunt zones are

either fully protected or State-listed species, detecting and preventing illegal take is a high priority for the Department.

## DEPREDATION

The Department does not have the authority to issue kill permits for bighorn sheep causing property damage (Section 4181, Fish and Game Code). As a result, depredation does not affect the population of bighorn sheep and no potential exists for any cumulative impact with the proposed project

## THE INDIVIDUAL ANIMAL

The proposed project will result in the deaths of individual bighorn sheep, and wounding losses could occur as a result of implementation of the proposed project. However, the Department is aware of only one animal having been lost after being wounded in 32 hunting seasons. Thus, the rate of wounding is extremely low, and the cumulative impacts of the potential harvest increase of 23 rams statewide, for a maximum of 42 mature Nelson bighorn sheep statewide, combined with the exceedingly low rate of wounding, would not result in an impact that could be considered to significantly impact the population of bighorn sheep inhabiting any hunt zone, or the state of California as a whole. For more discussion of wounding losses, see the Environmental Document for Bighorn Sheep Hunting (California Department of Fish and Game 2005b) and incorporated herein by reference.

## GLOBAL CLIMATE CHANGE

Climate change caused by increasing atmospheric concentrations of greenhouse gases are expected to result in marked changes in climate throughout the world (deVos and McKinney 2005). Although many wildlife habitats in North America have become progressively warmer and drier in the last 12,000 years (Lane et al. 1994, Ball et al. 1998), the greatest rate of change has occurred during the last 150 years (Fredrickson et al. 1998). Predicted changes due to continued warming include increased frequency and severity of wildfires, increased frequency of extreme weather events, regional variation in precipitation, northward and upward shifts in vegetative communities, and modifications to existing biotic communities (Bachelet et al. 2001, McCarty 2001, Walther et al. 2002). These changes are expected to affect abundance, distribution, and

structure of vegetative and animal communities (Kappelle et al. 1999).

Local and specific regional changes in climate and associated changes in vegetative communities will be the determining factors regarding the distribution and abundance of bighorn sheep in California and elsewhere. Although research specific to bighorn sheep responses to climate change is limited, available information indicates those populations inhabiting the hottest, low-lying mountain ranges will be among the first to be impacted (Epps et al. 2004), but those populations inhabiting the highest and most botanically diverse desert ranges may be less affected, and serve as refugia for the species (Epps et al. 2006). Moreover, some areas occupied by bighorn sheep may experience increases in the quality of habitat (Epps et al. 2006).

Populations of bighorn sheep in California are vulnerable to any decrease in habitat quality as mediated by climate change (Epps et al. 2006, Stewart et al. 2016) For example, higher spring and summer temperatures will result in reduced diet quality for bighorn sheep (Epps 2004), and extended droughts and drying of water sources may produce die-offs of adult animals (Allen 1980). Among bighorn sheep inhabiting desert environments, diet quality or forage availability influence body condition, which affects reproduction and recruitment rates (Wehausen 2005) and, ultimately, population size. Thus, future changes in climate that result in warmer temperatures or greater aridity have the potential to result in fewer bighorn sheep in desert ecosystems (Epps et al. 2006). Nevertheless, habitat conditions in some areas currently occupied by bighorn sheep, for example the San Gabriel Mountains and other transverse ranges of California, may experience changes that will be of benefit to bighorn sheep (Epps et al. 2006) as a result of lower densities of vegetation (Epps et al. 2006). Thus, available information indicates global climate change portends both adverse and beneficial effects to bighorn sheep habitat and, ultimately, bighorn sheep populations.

Bighorn sheep hunting in California is regulated by the California Fish and Game Commission. Hunting seasons and tag quotas are proposed to the Commission for adoption on an annual basis. These seasons and quotas are based on annual population estimates as dictated by the California Legislature (Fish and Game Code Section 4902) and are adjusted each year as needed. Although the impacts of climate change on bighorn sheep in California could be positive in some instances, they most certainly will be negative in others. Nevertheless, the Department and the Commission have the ability to quickly respond to population fluctuations by increasing or decreasing

hunter opportunity in accordance with current and future management objectives for this species. Reducing one mortality factor, for example sport hunting, will not alone mitigate for impacts associated with global climate change. The ability to manage and provide adequate amounts of resources, both nutritional and otherwise, will be the factor that ultimately dictates persistence of populations. Therefore, the Commission does not anticipate that global climate change will have a significant cumulative impact on the bighorn sheep populations.

## CHAPTER 5. ALTERNATIVES TO THE PROJECT

The Commission considered two alternatives to the proposed project, which would modify tag quotas, create one additional hunt zone for bighorn sheep, and reallocate a fund-raising tag.

### ALTERNATIVE 1 – NO CHANGE

The "no-change" alternative would continue to provide hunting opportunities for mature Nelson bighorn rams in the nine hunt zones that currently are open to that activity. The range of tags available to hunt bighorn sheep in each of those zones would remain the same, and would not be subject to adjustment as determined by the Department's annual population estimates as specified in Section 4901 of the Fish and Game Code. One fund-raising tag, currently designated in the Kelso and Old Dad Peak Hunt Zone, would remain in place, and not used for fund-raising purposes given the disease impacts that herd unit has sustained. In short, there would be no change from the 2018 bighorn sheep hunting regulations. Because there would be no change in existing conditions or current levels of hunting activity and bighorn sheep harvest, the no-project alternative would not lead to any potential significant impacts on the environment.

### ALTERNATIVE 2 – INCREASED HARVEST

The ranges of potential hunting tags available for each zone is intentionally conservative. Tag allocation is based on the number of mature rams known to exist in each zone, or on the number of mature rams estimated to be present following application of an extremely conservative correction factor ( $n/0.80$ ) that assumes aerial surveys account for 80 percent of the animals present. However, Wehausen and Bleich (2007) reported aerial surveys in an ecologically similar mountain range produced

observations of less than 50 percent of the total number estimated compared to mark-resight methods.

To increase the tag range by 50 percent in the existing nine zones beyond the range of tags proposed by the Department (Appendix 2 and Table 2) could result in a violation of state law if the end result exceeded more than 15 percent of the total number of mature Nelson bighorn sheep rams known or estimated to be present in any single hunt zone. Increasing tags beyond current levels needs to be carefully considered for consistency with statutory requirements. Under the "increased harvest" alternative, it is possible that support for bighorn sheep management programs among interested conservation groups and hunters could decline, because conservation has been at the forefront of issues affecting bighorn sheep. An increased rate of harvest would not likely be supported among bighorn sheep advocacy groups.

Because neither the proposed project nor the alternatives are anticipated to cause any significant impacts on the environment, there is no environmentally superior alternative. However, the proposed project most closely meets the objectives of Section 1801 of the FGC.

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NOTE: these documents are generally available through university libraries. Documents prepared by governmental agencies can be obtained through those agencies.

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## **Appendix 1. Existing Regulatory Language for Bighorn Sheep Hunting with Proposed 2019 Changes**

§362. Nelson Bighorn Sheep.

(a) Areas:

(1) Zone 1 - Marble/Clipper Mountains: That portion of San Bernardino County beginning at the intersection of Kelbaker Road and the National Trails Highway; north on Kelbaker Road to the junction with Interstate Highway 40; east on Interstate Highway 40 to the intersection with National Trails Highway; southwest on National Trails Highway to junction with Kelbaker Road.

(2) Zone 2 - Kelso Peak and Old Dad Mountains: That portion of San Bernardino County beginning at the intersection of Kelbaker Road and the Union Pacific Railroad in Kelso; southwest along the Union Pacific Railroad to intersection with unnamed road at Crucero; north on unnamed road to the merging with Mojave Road; northeast on Mojave Road to the junction with Zzyzx Road; north on Zzyzx Road to intersection with Interstate Highway 15; northeast on Interstate Highway 15 to the intersection with Cima Road; south on Cima Road to the intersection with the Union Pacific Railroad in Cima; southwest on the Union Pacific Railroad to the intersection with Kelbaker Road in Kelso.

(3) Zone 3 - Clark and Kingston Mountain Ranges: That portion of San Bernardino and Inyo counties beginning at the intersection of Interstate Highway 15 and California State Highway 127 in Baker; north on California State Highway 127 to the junction with Old Spanish Gentry Road at Tecopa; southeast on Old Spanish Gentry Road to the junction with Furnace Creek Road; southeast on Furnace Creek Road to the junction with Mesquite Valley Road; north on Mesquite Valley Road to Old Spanish Trail Highway; north and east on Old Spanish Trail Highway to California/Nevada state line; southeast on California/Nevada state line to the intersection with Interstate Highway 15; southwest on Interstate Highway 15 to the junction with California State Highway 127.

(4) Zone 4 - Orocopia Mountains: That portion of Riverside County beginning at the intersection of Interstate Highway 10 and Cottonwood Springs Road; east on Interstate Highway 10 to the junction with Red Cloud Mine Road; south on Red Cloud Mine Road to the junction with the Eagle Mountain Mining Railroad; southwest on the Eagle Mountain Mining Railroad to the junction with the Bradshaw Trail; southwest on the Bradshaw Trail to the Intersection with the Coachella Canal; west along the Coachella Canal to the junction with Box Canyon Road; northeast on Box Canyon Road to the junction with Cottonwood Springs Road; north on Cottonwood Springs Road to the intersection with Interstate Highway 10.

(5) Zone 5 - San Gorgonio Wilderness: That portion of Riverside and San Bernardino counties beginning at the intersection of Interstate Highway 10 and California State Highway 62, west on Interstate Highway 10 to the junction with California State Highway 30; north on California State Highway 30 to the junction with California State Highway 38; east and north on California State Highway 38 to the junction with Forest Service Route 1N01; east on Forest Service Route 1N01 to its joining with Pipes Road; east on Pipes Road to the junction with Pioneertown Road; southeast on Pioneertown Road to the junction with California State Highway 62; southwest on California State Highway 62 to the intersection with Interstate Highway 10.

(6) Zone 6 - Sheep Hole Mountains: That portion of San Bernardino County beginning at the junction of California State Highway 62 and Ironage Road; northwest on Ironage Road to the intersection with Amboy Road; north on Amboy Road to the intersection with National Trails Highway; east on National Trails Highway to the junction with Saltus Road; southeast on Saltus Road to the junction with unnamed road in Saltus that runs through Cadiz Valley; southeast on unnamed road to the intersection with California State Highway 62; west on California State Highway 62 to the junction with Ironage Road.

(7) Zone 7 - White Mountains: That portion of Mono County within a line beginning at U.S. Highway 6 and the Mono-Inyo county line; northward on Highway 6 to the California-Nevada State Line; southeasterly along the California-Nevada State Line to the Mono-Inyo County Line; westward along the Mono-Inyo County Line to the point of beginning.

(8) Zone 8 - South Bristol Mountains: That portion of San Bernardino County beginning at the junction of Kelbaker Road and the National Trails Highway; west on the National Trails Highway to the intersection with Interstate Highway 40; east on Interstate Highway 40 to the junction with Kelbaker Road; south on Kelbaker Road to the point of beginning.

(9) Zone 9 - Cady Mountains: That portion of San Bernardino County beginning at the junction of Interstate Highway 40 and Newberry Road; north on Newberry Road to intersection with Riverside Road; East on Riverside Road to junction with Harvard Road; north on Harvard Road to junction with Interstate Highway 15; northeast on Interstate Highway 15 to junction with Basin Road; south on Basin Road to intersection with Union Pacific Railroad; east on Union Pacific Railroad to intersection with Crucero Road; south on Crucero Road to intersection with Interstate Highway 40; west on Interstate Highway 40 to the point of beginning.

(10) Zone 10 – Newberry, Rodman and Ord Mountains: That portion of San Bernardino County beginning at the junction with Interstate 40 and Barstow Road; South on Barstow Road to the junction with Northside Road; East on Northside Road to the intersection with Camp Rock Road; Northeast on Camp Rock Road to the intersection with Powerline Road; East on Powerline Road and continue on Transmission Line Road to the

intersection with Interstate 40, West along Interstate 40, to the point of the beginning

(b) Seasons:

(1) Open Zone Fund-raising Tag: The holder of the fund-raising license tag issued pursuant to subsection 4902(d) of the Fish and Game Code may hunt:

(A) Zones 1 through 4, 6, 8 and 9: Beginning the first Saturday in November and extending through the first Sunday in February.

(B) Zone 5: Beginning the third Saturday in November and extending through the third Sunday in February.

(C) Zone 7: Beginning the first Saturday in August and extending through the last Sunday in September.

(2) Marble/Clipper/South Bristol Mountains Fund-raising Tag: The holder of the fund-raising license tag issued pursuant to subsection 4902(d) of the Fish and Game Code may hunt:

(A) Zones 1 and 8: Beginning the first Saturday in November and extending through the first Sunday in February.

(3) ~~Kelso Peak and Old Dad Mountains~~ Cady Mountains Fund-raising Tag: The holder of the fund-raising license tag issued pursuant to subsection 4902(d) of the Fish and Game Code may hunt:

(A) ~~Zone 2:~~ Zone 9: Beginning the first Saturday in November and extending through the first Sunday in February.

(4) Except as provided in subsection 362(b)(1), the Nelson bighorn sheep season in the areas described in subsection 362(a) shall be defined as follows:

(A) ~~Zones 1 through 4, 6, 8 and 9:~~ Zones 1, 2, 3, 4, 6, 8, 9, and 10: The first Saturday in December and extend through the first Sunday in February.

(B) Zone 5: The third Saturday in December and extend through the third Sunday in February.

(C) Zone 7: Beginning the third Saturday in August and extending through the last Sunday in September.

(5) Except as specifically provided in section 362, the take of bighorn sheep is prohibited.

(c) Bag and possession Limit: One mature ram defined as follows: a male Nelson bighorn sheep (*Ovis canadensis nelsoni*) having at least one horn, the tip of which extends beyond a point in a straight line beginning at the front (anterior) edge of the horn base, and extending downward through the rear (posterior) edge of the visible portion of the eye and continuing downward through the horn. All reference points are based on viewing the ram directly from a 90 degree angle from which the head is facing. A diagram showing the correct viewing procedure shall be distributed by the department to each successful

applicant.

d) Number of License Tags:

	<i>Tag</i>
<i>Nelson Bighorn Sheep Hunt Zones</i>	<i>Allocation</i>
Zone 1 - Marble/Clipper Mountains	-4[ <u>0-5</u> ]
Zone 2 - Kelso Peak/Old Dad Mountains	-0[ <u>0-4</u> ]
Zone 3 - Clark/Kingston Mountain Ranges	-2[ <u>0-4</u> ]
Zone 4 - Orocopia Mountains	-1[ <u>0-2</u> ]
Zone 5 - San Gorgonio Wilderness	-2[ <u>0-3</u> ]
Zone 6 - Sheep Hole Mountains	-0[ <u>0-2</u> ]
Zone 7 - White Mountains	-3[ <u>0-6</u> ]
Zone 8 - South Bristol Mountains	-1[ <u>0-3</u> ]
Zone 9 - Cady Mountains	-4[ <u>0-4</u> ]
<u>Zone 10 – Newberry, Rodman, Ord Mountains</u>	[ <u>0-6</u> ]
Open Zone Fund-Raising Tag	1
Marble/Clipper/South Bristol Mountains Fund-Raising Tag	1
<del>Kelso Peak/Old Dad Mountains</del> <u>Cady Mountains</u> Fund-Raising Tag	-0 <u>1</u>
Total:	-19[ <u>0-42</u> ]

(e) Conditions:

(1) Nelson bighorn rams shall only be taken between one-half hour before sunrise and one-half hour after sunset.

(2) Only methods specified in sections 353 and 354, Title 14, CCR, for taking bighorn sheep may be used.

(3) Each tagholder shall possess a spotting telescope capable of magnification of 15 power (15X), which is not affixed to a rifle, while hunting.

(4) Successful general tagholders shall present the head and edible portion of the carcass of a bighorn ram to the department's checking station within 48 hours after killing the animal. All successful tagholders shall notify the department's Bishop office by telephone at (760) 872-1171 or ~~(760) 413-9596~~ (760) 872-1346 within 24 hours of killing the animal and arrange for the head and carcass to be examined.

(5) All successful bighorn sheep tagholders shall make the horns of each ram available to the department to be permanently marked in the manner prescribed by the department for identification purposes within 48 hours of killing the animal. The purpose of the permanent marking shall be to identify Nelson bighorn rams which were legally taken and

which may be transported and possessed outside the areas described in subsection 362(a).

(6) The department reserves the right to take and use any part of the tagholder's bighorn ram, except the horns, for biological analysis as long as no more than one pound of edible meat is removed.

Note: Authority cited: Sections 200, 203, 265, 1050 and 4902, Fish and Game Code.

Reference: Sections 1050, 3950 and 4902, Fish and Game Code.

## **Appendix 2.**

### **California Fish and Game Code**

#### **Chapter 11. Bighorn Sheep [4900-4903]**

##### **4900. Legislative Declaration of Policy to Encourage Preservation, etc.**

The Legislature declares that bighorn sheep are an important wildlife resource of the state to be managed and maintained at sound biological levels. Therefore, it is hereby declared to be the policy of the state to encourage the preservation, restoration, utilization, and management of California's bighorn sheep population. The management shall be in accordance with the policy set forth in Section 1801.

*(Added by Stats. 1986, Ch. 745, Sec. 3.)*

##### **4901. Determining Status and Trend**

The department shall determine the status and the trend of bighorn sheep populations by management units. A plan shall be developed for each of the management units. The plan for each management unit shall include all of the following:

- (a) Data on the numbers, age, sex ratios, and distribution of bighorn sheep within the management unit.
- (b) A survey of range conditions and a report on the competition that may exist as a result of human, livestock, wild burro, or any other mammal encroachment.
- (c) An assessment of the need to relocate or reestablish bighorn populations.
- (d) A statement on the prevalence of disease or parasites within the population.
- (e) Recommendations for achieving the policy objective of Section 4900.

*(Added by Stats. 1986, Ch. 745, Sec. 3.)*

##### **4902. Nelson Bighorn Rams; Management, Hunting, Fees, etc.**

(a) The commission may adopt all regulations necessary to provide for biologically sound management of Nelson bighorn sheep (subspecies *Ovis canadensis nelsoni*).

(b) (1) After the plans developed by the department pursuant to Section 4901 for the management units have been submitted, the commission may authorize sport hunting of mature Nelson bighorn rams. Before authorizing the sport hunting, the commission shall take into account the Nelson bighorn sheep population statewide, including the population in the management units designated for hunting.

(2) Notwithstanding Section 219, the commission shall not, however, adopt regulations authorizing the sport hunting in a single year of more than 15 percent of the mature Nelson bighorn rams in a single management unit, based on the department's annual estimate of the population in each management unit.

(c) The fee for a tag to take a Nelson bighorn ram shall be four hundred dollars (\$400) for a resident of the state, which shall be adjusted annually pursuant to Section 713. On or before July 1, 2015, the commission shall, by regulation, fix the fee for a nonresident of the state at not less than one thousand five hundred dollars (\$1,500), which shall be adjusted annually pursuant to Section 713. Fee revenues shall be deposited in the Big Game Management Account established in Section 3953 and, upon appropriation by the Legislature, shall be expended as set forth in that section.

(d) The commission shall annually direct the department to authorize not more than three of the tags available for issuance that year to take Nelson bighorn rams for the purpose of raising funds for programs and projects to benefit Nelson bighorn sheep. These tags may be sold to residents or nonresidents of the State of California at auction or by another method and shall not be subject to the fee limitation prescribed in subdivision (c). Commencing with tags sold for the 1993 hunting season, if more than one tag is authorized, the department shall designate a nonprofit organization organized pursuant to the laws of this state, or the California chapter of a nonprofit organization organized pursuant to the laws of another state, as the seller of not less than one of these tags. The number of tags authorized for the purpose of raising funds pursuant to this subdivision, if more than one, shall not exceed 15 percent of the total number of tags authorized pursuant to subdivision (b). All revenue from the sale of tags pursuant to this subdivision shall be deposited in the Big Game Management Account established in Section 3953 and, upon appropriation by the Legislature, shall be expended as set forth in that section.

(e) No tag issued pursuant to this section shall be valid unless and until the licensee has successfully completed a prehunt hunter familiarization and orientation and has demonstrated to the department that he or she is familiar with the requisite equipment for participating in the hunting of Nelson bighorn rams, as determined by the commission. The orientation shall be conducted by the department at convenient locations and times preceding each season, as determined by the commission.

*(Amended by Stats. 2014, Ch. 467, Sec. 4. (AB 2105) Effective January 1, 2015.)*

### **4903. Revenues From Fees and Expenditures**

Revenue from the fees authorized by this chapter shall be deposited in the Big Game Management Account established in Section 3953 and, upon appropriation by the Legislature, shall be expended as set forth in that section. Administrative overhead shall be limited to the reasonable costs associated with the direct administration of the program. These funds shall be used to augment, and not to replace, moneys appropriated from existing funds available to the department for the preservation, restoration, utilization, and management of bighorn sheep. The department shall maintain internal accountability necessary to ensure that all restrictions on the expenditure of these funds are met.

**4904. Annual Report; Content**

[Repealed Stats. 2012]

### Appendix 3: Public Comments Received

Name and Date	Comment
<p>Andy Nickell 11/30/2018 Submitted via e-mail</p>	<p>Hello</p> <p>These are my comments on the bighorn sheep program in California:</p> <p>Because of limited numbers of bighorn sheep statewide I believe tag allocation should be based on providing maximum hunter opportunity to the greatest number of hunters.</p> <p>The majority of bighorn tags should be awarded in a random draw instead of using preference points. New hunters and young hunters will likely never catch up to the maximum point holders of today due to sheer numbers of hunters and low numbers of sheep, awarding 90% of sheep tags to max point holders only serves to discourage new hunters from even bothering to apply as well as driving hunters to apply out of state taking their conservation dollars elsewhere.</p> <p>Lack of hunter recruitment is one of many factors that will negatively impact conservation efforts in the future, and lack of opportunity is the leading cause of lack of hunter retention.</p> <p>Any new hunter who runs the numbers will see that with the current preference point system they have virtually no chance of hunting bighorn sheep in the state of California.</p> <p>To increase numbers of bighorn sheep we should look to Nevada's sheep program for guidance which has been extremely successful in restoring sheep populations statewide from a low point in the 1960s.</p> <p>Domestic sheep cause conflicts with bighorn sheep. Native wildlife should be given greater priority than agriculture. If this means cutting domestic grazing allotments then so be it.</p>

	Thank you
<p>Cliff St. Martin          Dry Creek          Outfitters          12/6/2018          Submitted via          email</p>	<p>Dry Creek Outfitters and crew spend countless days every year in the desert observing BHS and working closely with California Fish and Wildlife, SCBS, and California Wild Sheep.</p> <p>In doing so, we see the populations of BHS throughout different units. Few units are struggling with very low lamb recruitment and also populations doing very well. I would like to recommend below, harvest numbers in each unit that would be very conservative but yet an overall increase in most units but not all units. Obviously each year this quota needs be revisited.</p> <p>I apologize for not listing each unit by their individual “zone number” but I’m in the field and trying to stumble through this by phone.</p> <p>Kelso/ Old Dads - 0 tags again this season</p> <p>White Mountains- 4 tags total          Even though the Whites are a large unit access is limited. As a result all four tags could at the same time could be somewhat crowded. Also in the past there is interference with the sheep season opener the same date as the archery deer season. It would make for a much more enjoyable hunt for everyone to have it a split season with two tags for sheep beginning around August 1st. And running approx. 30days until first of Sept. The second season beginning the next day and running approx. 30 days until the first of October.</p> <p>Marble/ Clippers- 5 tags          Again with a split season. Starting the first Saturday in December and splitting it in half with the second half ending as usual.</p> <p>Clark/Kingston’s - 2 tags          Cady’s- 4 tags          Orocopias-1 tag          Sheep Holes- 1 tag</p>

San Gorgonios- 4 tags  
South Bristol's- 0

Also with the possibility of additional unit or units opening and having an additional auction tag ( zone specific )

We need to be sure the fund raising tag and zone specific tags are in separate units. The open zone tag should hold priority over all tags thus keeping the zone specific holder and the fund raising holder unable to hunt the two premier units in Calif. (Orocopias and San Gorgonios )

I strongly believe we need to lengthen the season dates for the auction hunters. The auction hunter pays a great deal of money to have a great hunt and this year was not good. Sheep were scattered throughout the unit where a specific ram was being hunted just two weeks before the opener. That along with the deer season opening the same day ruined the hunters opportunity at a great ram. This particular family has purchased this tag twice in the past three years spending approx. \$400,000.00 on the two tags.

I think that opening the season for the zone specific and open zone tag holder could begin as early as Sept. 1 and run through March or April at least. There should be no issues about this. Only one ram will be harvested and this would be a great incentive to more potential bidders.

## **Appendix 4: Environmental Checklist Form**

## Environmental Checklist form

NOTE: The following is a sample form and may be tailored to satisfy individual agencies' needs and project circumstances. It may be used to meet the requirements for an initial study when the criteria set forth in CEQA Guidelines have been met. Substantial evidence of potential impacts that are not listed on this form must also be considered. The sample questions in this form are intended to encourage thoughtful assessment of impacts, and do not necessarily represent thresholds of significance.

1. Project title: Bighorn Sheep Hunting
2. Lead agency name and address:  
California Fish and Game Commission  
1416 9<sup>th</sup> Street  
Sacramento, CA 95814
3. Contact person and phone number: Melissa Miller-Henson, Acting Executive Director, Fish and Game Commission,  
(916) 653-4389
4. Project location: Statewide
5. Project sponsor's name and address:  
California Department of Fish and Wildlife  
Wildlife Branch, 1812 9<sup>th</sup> Street  
Sacramento, CA 95811
6. General plan designation: N/A
7. Zoning: N/A
8. Description of project: (Describe the whole action involved, including but not limited to later phases of the project, and any secondary, support, or off-site features necessary for its implementation. Attach additional sheets if necessary.) The proposed project would modify bighorn sheep hunting tag quotas, establish a new hunt zone, and reallocate a fund-raising tag.
9. Surrounding land uses and setting: Briefly describe the project's surroundings:  
The project occurs in areas in Mono, San Bernardino, and Riverside Counties.
10. Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement.)  
N/A
11. Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code section 21080.3.1? If so, has consultation begun?  
No.

NOTE: Conducting consultation early in the CEQA process allows tribal governments, lead agencies, and project proponents to discuss the level of environmental review, identify and address potential adverse impacts to tribal cultural resources, and reduce the potential for delay and conflict in the environmental review process. (See Public Resources Code section 21083.3.2.) Information may also be available from the California Native American Heritage Commission's Sacred Lands File per Public Resources Code section 5097.96 and the California Historical Resources Information System administered by the California Office of Historic Preservation. Please also note that Public Resources Code section 21082.3(c) contains provisions specific to confidentiality.

**ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:**

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

- |   |   |  |
|---|---|--|
| <input type="checkbox"/> Aesthetics                         | <input type="checkbox"/> Agriculture and Forestry Resources | <input type="checkbox"/> Air Quality               |
| <input checked="" type="checkbox"/> Biological Resources    | <input type="checkbox"/> Cultural Resources                 | <input type="checkbox"/> Geology /Soils            |
| <input type="checkbox"/> Greenhouse Gas Emissions           | <input type="checkbox"/> Hazards & Hazardous Materials      | <input type="checkbox"/> Hydrology / Water Quality |
| <input type="checkbox"/> Land Use / Planning                | <input type="checkbox"/> Mineral Resources                  | <input type="checkbox"/> Noise                     |
| <input type="checkbox"/> Population / Housing               | <input type="checkbox"/> Public Services                    | <input checked="" type="checkbox"/> Recreation     |
| <input type="checkbox"/> Transportation/Traffic             | <input type="checkbox"/> Tribal Cultural Resources          | <input type="checkbox"/> Utilities/Service Systems |
| <input type="checkbox"/> Mandatory Findings of Significance |   |  |

DETERMINATION: (To be completed by the Lead Agency)

On the basis of this initial evaluation:

- I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT equivalent under the Commission's Certified Regulatory Plan is required.
- I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An SUPPLEMENTAL ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
- I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

\_\_\_\_\_  
Signature

2/19/19  
\_\_\_\_\_  
Date

**EVALUATION OF ENVIRONMENTAL IMPACTS:**

- 1) A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).
- 2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.
- 3) Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

- 4) "Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from "Earlier Analyses," as described in (5) below, may be cross-referenced).
- 5) Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:
  - a) Earlier Analysis Used. Identify and state where they are available for review.
  - b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.
  - c) Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.
- 6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.
- 7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.
- 8) This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.
- 9) The explanation of each issue should identify:
  - a) the significance criteria or threshold, if any, used to evaluate each question; and
  - b) the mitigation measure identified, if any, to reduce the impact to less than significance

Issues:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<u>I. AESTHETICS.</u> Would the project:				
a) Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

II. AGRICULTURE AND FORESTRY RESOURCES. In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the [California Agricultural Land Evaluation and Site Assessment Model \(1997\)](#) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the [Forest and Range Assessment Project](#) and the [Forest Legacy Assessment project](#); and forest carbon measurement methodology provided in [Forest Protocols](#) adopted by the California Air Resources Board. Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on <a href="#">the maps prepared pursuant to the Farmland Mapping and Monitoring Program</a> of the California Resources Agency, to non-agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with existing zoning for agricultural use, or a <a href="#">Williamson Act</a> contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in <a href="#">Public Resources Code section 12220(g)</a> ), timberland (as defined by <a href="#">Public Resources Code section 4526</a> ), or timberland zoned Timberland Production (as defined by <a href="#">Government Code section 51104(g)</a> )?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in the loss of forest land or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**III. AIR QUALITY.** Where available, the significance criteria established by the applicable [air quality management or air pollution control district](#) may be relied upon to make the following determinations. Would the project:

a) Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**IV. BIOLOGICAL RESOURCES:**  
Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the <a href="#">California Department of Fish and Game</a> or <a href="#">U.S. Fish and Wildlife Service</a> ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the <a href="#">California Department of Fish and Game</a> or <a href="#">US Fish and Wildlife Service</a> ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Have a substantial adverse effect on federally protected wetlands as defined by <a href="#">Section 404 of the Clean Water Act</a> (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Conflict with the provisions of an adopted <a href="#">Habitat Conservation Plan</a> , <a href="#">Natural Community Conservation Plan</a> , or other approved local, regional, or state habitat conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<u>V. CULTURAL RESOURCES.</u> Would the project:				
a) Cause a substantial adverse change in the significance of a <a href="#">historical resource</a> as defined in <a href="#">§ 15064.5</a> ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to <a href="#">§ 15064.5</a> ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Disturb any human remains, including those interred outside of dedicated cemeteries?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<u>VI. GEOLOGY AND SOILS.</u> Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to <a href="#">Division of Mines and Geology Special Publication 42</a> .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
d) Be located on <a href="#">expansive soil</a> , as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>VII. GREENHOUSE GAS EMISSIONS.</b> Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with an applicable plan, policy or <a href="#">regulation</a> adopted for the purpose of reducing the emissions of greenhouse gases?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>VIII. HAZARDS AND HAZARDOUS MATERIALS.</b> Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section <a href="#">65962.5</a> and, as a result, would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b><u>IX. HYDROLOGY AND WATER QUALITY.</u> Would the project:</b>				
a) Violate any <a href="#">water quality standards or waste discharge requirements</a> ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Substantially deplete <a href="#">groundwater</a> supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Otherwise substantially degrade water quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Place housing within a 100-year flood hazard area as mapped on a <a href="#">federal Flood Hazard Boundary</a> or <a href="#">Flood Insurance Rate Map</a> or other flood hazard delineation map?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
j) Inundation by seiche, tsunami, or mudflow?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>X. LAND USE AND PLANNING.</b> Would the project:				
a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	<b>Less Than Significant</b>			
	<b>Potentially Significant Impact</b>	<b>with Mitigation Incorporated</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>XI. MINERAL RESOURCES:</b> Would the project:				
a) Result in the loss of availability of a known <a href="#">mineral resource</a> that would be of value to the region and the residents of the state?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>XII. NOISE --</b> Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<u>XIII. POPULATION AND HOUSING.</u> Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<u>XIV. PUBLIC SERVICES.</u>				
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<u>XV. RECREATION.</u>				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Does the project include recreational facilities or require the construction or expansion of	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
recreational facilities which might have an adverse physical effect on the environment?				
c) Does the project have the potential to impact recreational activities dependent on wildlife, such as hunting or wildlife viewing?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**XVI. TRANSPORTATION/TRAFFIC.**

Would the project:

a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**XVII. TRIBAL CULTURAL RESOURCES**

a ) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape,

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
sacred place, or object with cultural value to a California Native American tribe, and that is:				
i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>XVIII. UTILITIES AND SERVICE SYSTEMS.</b>				
Would the project:				
a) Exceed wastewater treatment requirements of the applicable <a href="#">Regional Water Quality Control Board</a> ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Comply with <a href="#">federal</a> , <a href="#">state</a> , and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>XIX. MANDATORY FINDINGS OF SIGNIFICANCE</b>				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	<b>Potentially Significant Impact</b>	<b>Less Than Significant with Mitigation Incorporated</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
current projects, and the effects of probable future projects)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Note: Authority cited: Sections [21083](#) and [21083.05](#), [21083.09](#) Public Resources Code. Reference: [Section 65088.4](#), Gov. Code; Sections [21073](#), [21074](#) [21080\(c\)](#), [21080.1](#), [21080.3](#), [21083](#), [21083.05](#), [21083.3](#), [21080.3.1](#), [21080.3.2](#), [21082.3](#), [21084.2](#), [21084.3](#), [21093](#), [21094](#), [21095](#), and [21151](#), Public Resources Code; [Sundstrom v. County of Mendocino, \(1988\) 202 Cal.App.3d 296](#); [Leonoff v. Monterey Board of Supervisors, \(1990\) 222 Cal.App.3d 1337](#); [Eureka Citizens for Responsible Govt. v. City of Eureka \(2007\) 147 Cal.App.4th 357](#); [Protect the Historic Amador Waterways v. Amador Water Agency \(2004\) 116 Cal.App.4th at 1109](#); [San Franciscans Upholding the Downtown Plan v. City and County of San Francisco \(2002\) 102 Cal.App.4th 656](#).

## Appendix 5: Desert Bighorn Sheep Surveys

Zone	Year	Survey Type	Number of Lambs	Number of Ewes	Number of Rams	Number of Unclassified	Total Counted
Marble Mountains & Clipper Mountains	2007	Helicopter	12	84	46	0	142
	2009	Helicopter	34	88	65	0	187
	2015	Helicopter	8	48	23	5	84
	2016	Ground	42	73	35	2	152
	2018	Ground	18	78	35	1	132
	2007	Helicopter	0	8	11	0	19
	2009	Helicopter	4	13	16	0	33
	2015	Helicopter	4	20	22	0	46
Clark Mountain Kingston Range	2007	Helicopter	0	31	18	0	49
	2009	Helicopter	0	12	8	0	20
	2015	Helicopter	0	1	3	0	4
	2016	Helicopter	1	31	13	5	50
	2007	Helicopter	3	27	21	0	51
	2009	Helicopter	6	33	20	0	59
	2015	Helicopter	9	25	14	0	48
	2016	Helicopter	3	31	19	2	55
	2018	Helicopter	5	80	34	0	119
White Mountains	2008	Helicopter	16	59	52	0	127
	2009	Helicopter	16	60	29	2	107
	2015	Ground	46	69	82	20	217
	2016	Ground	26	43	9	22	100
	2018	Ground	36	124	62	1	223
Cady Mountains	2007	Helicopter	12	59	38	0	109
	2009	Helicopter	37	92	38	0	167
	2010	Helicopter	23	102	49	0	174
	2018	Helicopter	8	58	27	0	93
Newberry, Rodman and Ord Mountains	2016	Helicopter	49	70	52	0	171
	2018	Helicopter	35	95	72	0	202

STATE OF CALIFORNIA  
FISH AND GAME COMMISSION  
STATEMENT OF REASONS FOR REGULATORY ACTION  
(Pre-adoption Statement of Reasons)

Amend Section 364  
Title 14, California Code of Regulations  
Re: Elk Hunts, Seasons, and Number of Tags

- I. Date of Initial Statement of Reasons: November 15, 2018
- II. Date of Pre-Adoption Statement of Reasons: April 4, 2019
- III. Dates and Locations of Scheduled Hearings:
- |                         |           |                   |
|-------------------------|-----------|-------------------|
| (a) Notice Hearing:     | Date:     | December 13, 2018 |
|                         | Location: | Oceanside, CA     |
| (b) Discussion Hearing: | Date:     | February 6, 2019  |
|                         | Location: | Sacramento, CA    |
| (c) Discussion Hearing: | Date:     | April 17, 2019    |
|                         | Location: | Santa Monica, CA  |
| (d) Adoption Hearing    | Date:     | May 16, 2019      |
|                         | Location: | Teleconference    |
- IV. Description of Modification of Originally Proposed Language of Initial Statement of Reasons:
- The originally proposed regulatory language contained tag quota ranges for each elk hunt. A specific tag allocation is proposed for each zone within these ranges.
- V. Reasons for Modification of Originally Proposed Language of Initial Statement of Reasons:
- The originally proposed regulatory language contained tag quota ranges for each elk hunt. The Department's final recommendations for specific tag quotas in each hunt zone are set forth in the attached Regulatory Text. These are based on input from Department regional staff and public to address goals for the unit, including alleviating depredation concerns.
- VI. Summary of Primary Considerations Raised in Opposition and in Support:  
See attachment.

## Updated Informative Digest/Policy Statement Overview

Current regulations in Section 364, Title 14, CCR, provide definitions, hunting zone descriptions, season dates and elk license tag quotas. In order to achieve elk herd management goals and objectives and maintain hunting quality, it is periodically necessary to adjust quotas, seasons, hunt areas and other criteria, in response to dynamic environmental and biological conditions. The proposed amendments to Section 364 will establish 2019 tag quotas, season dates, and tag distribution within each hunt adjusting for annual fluctuations in populations.

Proposed Amendments: The proposed ranges of elk tags for 2019 are presented in the Proposed Regulatory Text of Section 364.

1. Subsections 364(r) through (aa) specify elk license tag quotas for each hunt in accordance with management goals and objectives.
2. Amend and correct the Special Condition in subsection (d)(13)(B)3. East Park Reservoir General Methods Tule Elk Hunt, alerting hunters to the current Colusa County variance which permits the use of muzzleloaders.
3. Modify Season Dates. Due to military use constraints at Fort Hunter Liggett, hunt dates are annually subject to change and may be adjusted or cancelled by the base commander.

### Benefits of the regulations

The proposed regulations will contribute to the sustainable management of elk populations in California. Existing elk herd management goals specify objective levels for the proportion of bulls in the herds. These ratios are maintained and managed in part by periodically modifying the number of tags. The final number of tags will be based upon findings from annual harvest, herd composition counts, and population estimates where appropriate.

### Non-monetary benefits to the public

The Commission does not anticipate non-monetary benefits to the protection of public health and safety, worker safety, the prevention of discrimination, the promotion of fairness or social equity and the increase in openness and transparency in business and government

### Evaluation of incompatibility with existing regulations

The Fish and Game Commission, pursuant to Fish and Game Code Sections 200 and 203, has the sole authority to regulate elk hunting in California. Commission staff has searched the California Code of Regulations and has found the proposed changes pertaining to elk tag allocations are consistent with Title 14. Therefore, the Commission has determined that the proposed amendments are neither inconsistent nor incompatible with existing State regulations.

**The attached regulatory text and table has been amended from the version in the Initial Statement of Reasons to replace tag quota ranges with specific recommended tag quotas for each hunt.**

## REGULATORY TEXT

Section 364 is amended to read as follows:

### **§364. Elk Hunts, Seasons, and Number of Tags.**

*. . . [ No changes subsections (a) through (d)(10) ]*

(11) Grizzly Island General Methods Tule Elk Hunt:

(A) Area: Those lands owned and managed by the Department of Fish and ~~Game~~ Wildlife as the Grizzly Island Wildlife Area.

(B) Special Conditions: All tagholders will be required to attend a mandatory orientation. Tagholders will be notified of the time and location of the orientation meeting after receipt of their elk license tags.

*. . . [ No changes subsection (d)(12) ]*

(13) East Park Reservoir General Methods Tule Elk Hunt:

(A) Area: In those portions of Glenn and Colusa counties within a line beginning in Glenn County at the junction of Interstate Highway 5 and Highway 162 at Willows; west along Highway 162 (Highway 162 becomes Alder Springs Road) to the Glenn Mendocino County line; south along the Glenn-Mendocino County line to the Glenn Lake County line; east and then south along the Glenn-Lake County line to the Colusa Lake County line; west, and then southeast along the Colusa-Lake County line to Goat Mountain Road; north and east along Goat Mountain Road to the Lodoga-Stonyford Road; east along the Lodoga-Stonyford Road to the Sites-Lodoga Road at Lodoga; east along the Sites-Lodoga Road to the Maxwell-Sites Road at Sites; east along the Maxwell-Sites Road to Interstate Highway 5 at Maxwell; north along Interstate Highway 5 to the point of beginning.

(B) Special Conditions:

1. All tagholders will be required to attend a mandatory orientation. Tagholders will be notified of the time and location of the orientation meeting after receipt of their elk license tags.

2. Access to private land may be restricted or require payment of an access fee.

3. A Colusa County ordinance prohibits firearms on land administered by the USDI Bureau of Reclamation in the vicinity of East Park Reservoir. ~~A variance has been requested to allow~~ A county variance currently allows for the use of muzzleloaders (as defined in Section 353) on Bureau of Reclamation land within the hunt zone, hunters are responsible for checking with county authorities for any change in the variance.

*. . . [ No changes subsections (d)(14) through (q) ]*

§	Hunt	1. Bull Tags	2. Antlerless Tags	3. Either-Sex Tags	4. Spike Tags
		5. Season			
(r) Department Administered General Methods Roosevelt Elk Hunts					
(1)(A)	Siskiyou	20	20		
		Shall open on the Wednesday preceding the second Saturday in September and continue for 12 consecutive days.			
(2)(A)	Northwestern	15	0	3	
		Shall open on the first Wednesday in September and continue for 23 consecutive days.			
(3)(A)	Marble Mountains	35	10		
		Shall open on the Wednesday preceding the second Saturday in September and continue for 12 consecutive days.			
(s) Department Administered General Methods Rocky Mountain Elk Hunts					
(1)(A)	Northeastern California Bull	15			
		The bull season shall open on the Wednesday preceding the third Saturday in September and continue for 12 consecutive days			
(B)	Northeastern California Antlerless		10		
		The antlerless season shall open on the second Wednesday in November and continue for 12 consecutive days.			
(t) Department Administered General Methods Roosevelt/Tule Elk Hunts					
(1)(A)	Mendocino	2	0		
		The season shall open on the Wednesday preceding the fourth Saturday in September and continue for 12 consecutive days.			
(u) Department Administered General Methods Tule Elk Hunts					
(1)(A)	Cache Creek Bull	2			
		The Bull season shall open on the second Saturday in October and continue for 16 consecutive days.			

(B)	Antlerless	2		
		The Antlerless season shall open on the third Saturday in October and continue for 16 consecutive days.		
(2)(A)	La Panza Period 1	6	5	
		Shall open on the second Saturday in October and extend for 23 consecutive days		
(B)	Period 2	6	6	
		Shall open on the second Saturday in November and extend for 23 consecutive days.		
(3)(A)	Bishop Period 3	0	0	
		Shall open on the third Saturday in October and extend for 9 consecutive days.		
(B)	Period 4	0	0	
		Shall open on the first Saturday in November and extend for 9 consecutive days.		
(C)	Period 5	0	0	
		Shall open on the first Saturday in December and continue for 9 consecutive days.		
(4)(A)	Independence Period 2	1	1	
		Shall open on the first Saturday in October and extend for 9 consecutive days.		
(B)	Period 3	1	1	
		Shall open on the third Saturday in October and extend for 9 consecutive days.		
(C)	Period 4	0	1	
		Shall open on the first Saturday in November and extend for 9 consecutive days.		
(D)	Period 5	0	0	
		Shall open on the first Saturday in December and continue for 9 consecutive days.		
(5)(A)	Lone Pine Period 2	1	1	
		Shall open on the first Saturday in October and extend for 9 consecutive days.		
(B)	Period 3	1	1	
		Shall open on the third Saturday in October and extend for 9 consecutive days.		

(C)	Period 4	0	1		
		Shall open on the first Saturday in November and extend for 9 consecutive days.			
(D)	Period 5	0	0		
		Shall open on the first Saturday in December and continue for 9 consecutive days.			
(6)(A)	Tinemaha Period 2	0	0		
		Shall open on the first Saturday in October and extend for 9 consecutive days.			
(B)	Period 3	0	0		
		Shall open on the third Saturday in October and extend for 9 consecutive days.			
(C)	Period 4	0	0		
		Shall open on the first Saturday in November and extend for 9 consecutive days.			
(D)	Period 5	0	0		
		Shall open on the first Saturday in December and continue for 9 consecutive days.			
(7)(A)	West Tinemaha Period 1	0	0		
		Shall open on the second Saturday in September and extend for 16 consecutive days.			
(B)	Period 2	0	0		
		Shall open on the first Saturday in October and extend for 9 consecutive days.			
(C)	Period 3	0	0		
		Shall open on the third Saturday in October and extend for 9 consecutive days.			
(D)	Period 4	0	0		
		Shall open on the first Saturday in November and extend for 9 consecutive days.			
(E)	Period 5	0	0		
		Shall open on the first Saturday in December and continue for 9 consecutive days.			
(8)(A)	Tinemaha Mountain Period 1	0			
		Shall open on the second Saturday in September and extend for 16 consecutive days.			

(B)	Period 2	0			
		Shall open on the first Saturday in October and extend for 9 consecutive days.			
(C)	Period 3	0			
		Shall open on the third Saturday in October and extend for 9 consecutive days			
(D)	Period 4	0			
		Shall open on the first Saturday in November and extend for 9 consecutive days.			
(E)	Period 5	0			
		Shall open on the first Saturday in December and continue for 9 consecutive days.			
(9)(A)	Whitney Period 2	0	0		
		Shall open on the first Saturday in October and extend for 9 consecutive days.			
(B)	Period 3	0	0		
		Shall open on the third Saturday in October and extend for 9 consecutive days			
(C)	Period 4	0	0		
		Shall open on the first Saturday in November and extend for 9 consecutive days.			
(D)	Period 5	0	0		
		Shall open on the first Saturday in December and continue for 9 consecutive days.			
(10)(A)	Goodale Period 1	0	0		
		Shall open on the second Saturday in September and extend for 16 consecutive days.			
(B)	Period 2	0	0		
		Shall open on the first Saturday in October and extend for 9 consecutive days.			
(C)	Period 3	0	1		
		Shall open on the third Saturday in October and extend for 9 consecutive days			
(D)	Period 4	0	0		
		Shall open on the first Saturday in November and extend for 9 consecutive days.			

(E)	Period 5	0	0		
		Shall open on the first Saturday in December and continue for 9 consecutive days.			
(11)(A)	Grizzly Island Period 1	0	6		0
		Shall open on the second Tuesday after the first Saturday in August and continue for 4 consecutive days.			
(B)	Period 2	0	2		4
		Shall open on the first Thursday following the opening of period one and continue for 4 consecutive days.			
(C)	Period 3	0	6		0
		Shall open on the first Tuesday following the opening of period two and continue for 4 consecutive days			
(D)	Period 4	0	4		2
		Shall open on the first Thursday following the opening of period three and continue for 4 consecutive days.			
(E)	Period 5	0	8		0
		Shall open on the first Tuesday following the opening of period four and continue for 4 consecutive days			
(F)	Period 6	0	0		0
		Shall open on the first Thursday following the opening of period five and continue for 4 consecutive days.			
(G)	Period 7	0	8		0
		Shall open on the first Tuesday following the opening of period six and continue for 4 consecutive days			
(H)	Period 8	0	0		6
		Shall open on the first Thursday following the opening of period seven and continue for 4 consecutive days.			
(I)	Period 9	0	8		0
		Shall open on the first Tuesday following the opening of period eight and continue for 4 consecutive days.			
(J)	Period 10	0	0		0
		Shall open on the first Thursday following the opening of period nine and continue for 4 consecutive days.			
(K)	Period 11	0	8		0
		Shall open on the first Tuesday following the opening of period ten and continue for 4 consecutive days.			

(L)	Period 12	3	0		0
		Shall open on the first Thursday following the opening of period eleven and continue for 4 consecutive days.			
(M)	Period 13	0	8		0
		Shall open on the first Tuesday following the opening of period twelve and continue for 4 consecutive days.			
(12)(A)	Fort Hunter Liggett General Public Period 1	0	0		
		Shall open on the first Thursday in November and continue for 9 consecutive days.			
(B)	Period 2	0	0		
		Shall open November 22 and continue for 9 consecutive days.			
(C)	Period 3	0	0		
		Shall open on the third Saturday in December and continue for <del>16</del> <u>12</u> consecutive days.			
(13)(A)	East Park Reservoir	2	2		
		Shall open the first Saturday in September and continue for 27 consecutive days.			
(14)(A)	San Luis Reservoir	0	0	5	
		Shall open on the first Saturday in October and continue for 23 consecutive days.			
(15)(A)	Bear Valley	2	1		
		Shall open on the second Saturday in October and continue for 9 consecutive days.			
(16)(A)	Lake Pillsbury Period 1		4		
		Shall open on the Wednesday preceding the second Saturday in September and continue for 10 consecutive days.			
(B)	Period 2	2			
		Shall open Monday following the fourth Saturday in September and continue for 10 consecutive days.			
(17)(A)	Santa Clara	0	0		
		Shall open on the second Saturday in October and continue for 16 consecutive days.			
(18)(A)	Alameda	0	0		
		Shall open on the second Saturday in October and continue for 16 consecutive days.			

(v) Department Administered Apprentice Hunts				
(1)(A)	Marble Mountain General Methods Roosevelt Elk Apprentice			<u>24</u>
		Shall open on the Wednesday preceding the second Saturday in September and continue for 12 consecutive days.		
(2)(A)	Northeast California General Methods Rocky Mountain Elk Apprentice		2	
		Shall open on the Wednesday preceding the third Saturday in September and continue for 12 consecutive days		
(3)(A)	Cache Creek General Methods Tule Elk Apprentice	1	0	
		Shall open on the second Saturday in October and continue for 16 consecutive days.		
(4)(A)	La Panza General Methods Tule Elk Apprentice	0	1	
		Shall open on the second Saturday in October and extend for 23 consecutive days.		
(5)(A)	Bishop General Methods Tule Elk Apprentice Period 2	0	0	
		Shall open on the first Saturday in October and extend for 9 consecutive days.		
(6)(A)	Grizzly Island General Methods Tule Elk Apprentice Period 1		3	0
		Shall open on the second Tuesday after the first Saturday in August and continue for 4 consecutive days		
(B)	Period 2		0	2
		Shall open on the first Thursday following the opening of period one and continue for 4 consecutive days.		
(C)	Period 3		3	0
		Shall open on the first Tuesday following the opening of period two and continue for 4 consecutive days.		
(D)	Period 4		0	2
		Shall open on the first Thursday following the opening of period three and continue for 4 consecutive days.		
(7)(A)	Fort Hunter Liggett General Public General Methods Apprentice	0	0	
		Shall open on the third Saturday in December and continue for <del>16</del> <u>12</u> consecutive days.		

(w) Department Administered Archery Only Hunts					
(1)(A)	Northeast California Archery Only	0	0	10	
		Shall open on the Wednesday preceding the first Saturday in September and continue for 12 consecutive days.			
(2)(A)	Owens Valley Multiple Zone Archery Only	3	0		
		Shall open on the second Saturday in August and extend for 9 consecutive days.			
(3)(A)	Lone Pine Archery Only Period 1	0	1		
		Shall open on the second Saturday in September and extend for 16 consecutive days.			
(4)(A)	Tinemaha Archery Only Period 1	0	0		
		Shall open on the second Saturday in September and extend for 16 consecutive days.			
(5)(A)	Whitney Archery Only Period 1	0	0		
		Shall open on the second Saturday in September and extend for 16 consecutive days.			
(6)(A)	Fort Hunter Liggett General Public Archery Only Either Sex			3	
		Shall open on the last <del>Wednesday</del> <u>Saturday</u> in July and continue for 9 consecutive days.			
(B)	Fort Hunter Liggett General Public Archery Only Antlerless		4		
		Shall open on the <del>Tuesday preceding the fourth Thursday</del> <u>Second Saturday</u> in November and continue for 9 consecutive days.			
(x) Department Administered Muzzleloader Only Tule Elk Hunts					
(1)(A)	Bishop Muzzleloader Only Period 1	0	0		
		Shall open on the second Saturday in September and extend for 16 consecutive days.			
(2)(A)	Independence Muzzleloader Only Period 1	1	0		
		Shall open on the second Saturday in September and extend for 16 consecutive days.			
(3)(A)	Goodale Muzzleloader Only Period 1	0	1		
		Shall open on the second Saturday in September and extend for 16 consecutive days.			

(4)(A)	Fort Hunter Liggett General Public Muzzleloader Only	4	0		
		Shall open on the <del>third</del> <u>forth</u> Saturday in <del>December</del> <u>November</u> and continue for <del>17</del> <u>9</u> consecutive days.			
(y) Department Administered Muzzleloader/Archery Only Hunts					
(1)(A)	Marble Mountain Muzzleloader/Archery Roosevelt Elk			5	10
		Shall open on the last Saturday in October and extend or 9 consecutive days.			
(z) Fund Raising Elk Tags					
(1)(A)	Multi-zone Fund Raising Tags	1			
		Siskiyou and Marble Mountains Roosevelt Elk Season shall open on the Wednesday preceding the first Saturday in September and continue for 19 consecutive days. Northwestern Roosevelt Elk Season shall open on the last Wednesday in August and continue for 30 consecutive days. Northeastern Rocky Mountain Elk Season shall open on the Wednesday preceding the last Saturday in August and continue for 33 consecutive days. La Panza Tule Elk Season shall open on the first Saturday in October and extend for 65 consecutive days.			
(2)(A)	Grizzly Island Fund Raising Tags	1			
		Shall open on the first Saturday in August and continue for 30 consecutive days.			
(3)(A)	Owens Valley Fund Raising Tags	1			
		Shall open on the last Saturday in July and extend for 30 consecutive days.			
(aa) Military Only Tule Elk Hunts					
(1)(A)	Fort Hunter Liggett Military Only General Methods Early Season	0	0		
		The early season shall open on the second Monday in August and continue for 5 consecutive days and reopen on the fourth Monday in August and continue for 5 consecutive days			

(B)	Period 1	0		
		Shall open on the first Thursday in November and continue for 9 consecutive days.		
(C)	Period 2	0		
		Shall open November 22 and continue for 9 consecutive days.		
(D)	Period 3	0		
		Shall open on the third Saturday in December and continue for <del>16</del> <u>12</u> consecutive days.		
(2)(A)	Fort Hunter Liggett Military Only General Methods Apprentice	0	0	
		Shall open on the third Saturday in December and continue for <del>16</del> <u>12</u> consecutive days.		
(3)(A)	Fort Hunter Liggett Military Only Archery Only Either Sex		3	
		Shall open on the last <del>Wednesday</del> <u>Saturday</u> in July and continue for 9 consecutive days.		
(B)	Antlerless	4		
		<del>Shall open on the last Wednesday in September and continue for 9 consecutive days.</del> <u>Shall open on the Second Saturday in November and continue for 9 consecutive days.</u>		
(4)(A)	Fort Hunter Liggett Military Only Muzzleloader Only	4		
		Shall open on the third Saturday in <del>December</del> <u>November</u> and continue for <del>17</del> <u>9</u> consecutive days.		

Note: Authority cited: Sections 200, 203, 203.1, 265, 332 and 1050, Fish and Game Code. Reference: Sections 332, 1050, 1570, 1571, 1572, 1573 and 1574, Fish and Game Code.

STATE OF CALIFORNIA  
FISH AND GAME COMMISSION  
STATEMENT OF REASONS FOR REGULATORY ACTION  
(Pre-adoption Statement of Reasons)

Amend Section(s) 364.1  
Title 14, California Code of Regulations  
Re: Elk Hunts, Seasons, and Number of Tags

- I. Date of Initial Statement of Reasons: November 15, 2018
- II. Date of Pre-Adoption Statement of Reasons: April 4, 2019
- III. Dates and Locations of Scheduled Hearings:
  - (a) Notice Hearing: Date: December 13, 2018  
Location: Oceanside, CA
  - (b) Discussion Hearing: Date: February 6, 2019  
Location: Sacramento, CA
  - (c) Discussion Hearing: Date: April 17, 2019  
Location: Santa Monica, CA
  - (d) Adoption Hearing Date: May 16, 2019  
Location: Teleconference
- IV. Description of Modification of Originally Proposed Language of Initial Statement of Reasons:

The originally proposed regulatory language contained elk tag quota ranges for the Northwestern and Northeastern Elk zones. The Department recommends specific tag quotas within these ranges for each elk zone.

Two errors in the proposed language of the Initial Statement of Reasons require correction. Section (i)(2) listed an antlerless tag range of 0-32. It should have been 0-34. Section (j)(1) did not list a tag range for either-sex tags. It should have listed a tag range of 0-2. No other modifications were made to the amended proposed language of the Initial Statement of Reasons.

- V. Reasons for Modification of Originally Proposed Language of Initial Statement of Reasons:

The originally proposed regulatory language contained elk tag quota ranges for the Northwestern and Northeastern Elk zones. The specific tag quotas have been identified after regional and public input to address depredation concerns. In the Northwestern elk zone the additional 21 antlerless and 6 bull tags will be distributed to the SHARE landowners in Del Norte and Humboldt County to help

alleviate property damage. The distribution will keep the tag allocation below 20% of the minimum counts for each area. In the Northeastern elk zone an additional four elk tags, two bull and two either-sex, will be authorized to two landowners in Shasta County to alleviate property damage. Most elk in the Northeastern elk zone are harvested out of the Devil's Garden sub-herd area. The Department's efforts would focus on new SHARE properties in the area of the Shasta Lake sub-herd.

VI. Summary of Primary Considerations Raised in Opposition and in Support:

This item will appear as an appendix to the Final Statement of Reasons.

## Updated Informative Digest/Policy Statement Overview

Current regulations in Section 364.1, SHARE Elk Hunts, T14, CCR, specify elk tag quotas for each hunt area. In order to achieve elk herd management goals and objectives and maintain hunting quality, it is periodically necessary to adjust quotas in response to dynamic environmental and biological conditions.

Preliminary tag quota ranges are indicated pending final 2019 tag allocations in accordance with elk management goals and objectives. Survey data collected between August 2018, and March 2019, will be the basis for the number of tags recommended to the Commission at the April 2019 adoption hearing.

The preliminary tag quota ranges for 2019 are found in the proposed Regulatory Text of Section 364.1

### Benefits of the regulations:

The proposed regulations will contribute to the sustainable management of elk populations and to relieve depredation damage to landowners in California. The final number of tags will be based upon findings from annual harvest and herd composition counts where appropriate

### Non-monetary benefits to the public:

The Commission does not anticipate non-monetary benefits to the protection of public health and safety, worker safety, the prevention of discrimination, the promotion of fairness or social equity and the increase in openness and transparency in business and government.

### Evaluation of Incompatibility with existing regulations:

The Fish and Game Commission, pursuant to Fish and Game Code Sections 200 and 203, has the sole authority to regulate elk hunting in California. Commission staff has searched the California Code of Regulations and has found the proposed changes pertaining to elk tag allocations are consistent with Title 14. Therefore, the Commission has determined that the proposed amendments are neither inconsistent nor incompatible with existing State regulations.

**The following table has been amended from the version in the Initial Statement of Reasons. The Department requests FGC authorize a 15-day notice extending the ranges for the Northwestern Elk Hunting Zone (subsection 364.1(i)(2)) from 0-32 to 34 antlerless tags and the Northeast California Elk Hunting Zone subsection 364.1(j)(1)) from 0 to 2 either sex tags. These amendments correct what is accurately reflected in the project as described in the Environmental Document. The corrected tag range in the table below and the final number of tags in the proposed regulatory text and table reflect a proposed increase of 20 tags in the Northwestern elk zone in Section 364. The tag range for either sex tags in the Northeast California Hunt Zone was inadvertently left out of the Initial Statement**

**of Reasons and is consistent with the approved tag quota ranges previously analyzed in the 2010 Environmental Document.**

§	(A) Hunts	1.	2.	3.	4.
		Bull Tags	Antlerless Tags	Either-Sex Tags	Spike Tags
		(B) Area			
<b>(i) Department Administered SHARE Roosevelt Elk Hunts</b>					
(1)	Siskiyou	2	2		
		(B) Area: The tag shall be valid in the area described in subsection 364(a)(1)(A).			
(2)	Northwestern	7 <u>13</u>	13 [ <del>0-3234</del> ] <u>34</u>	0	
		(B) Area: The tag shall be valid in the area described in subsection 364(a)(2)(A).			
(3)	Marble Mountain	0	0		
		(B) Area: The tag shall be valid in the area described in subsection 364(a)(3)(A).			
<b>(j) Department Administered General Methods SHARE Rocky Mountain Elk Hunts</b>					
(1)	Northeast California	0 <u>2</u>	0	0 <u>2</u>	
		(B) Area: The tag shall be valid in the area described in subsection 364(b)(1)(A).			
<b>(k) Department Administered SHARE Roosevelt/Tule Elk Hunts</b>					
(1)	Mendocino	2	4		
		(B) Area: The tag shall be valid in the area described in subsection 364(c)(1)(A).			
<b>(l) Department Administered SHARE Tule Elk Hunts</b>					
(1)	Cache Creek	1	1		
		(B) Area: The tag shall be valid in the area described in subsection 364(d)(1)(A).			
(2)	La Panza	5	10		
		(B) Area: The tag shall be valid in the area described in subsection 364(d)(2)(A).			
(3)	Bishop	0	0		
		(B) Area: The tag shall be valid in the area described in subsection 364(d)(3)(A).			
(4)	Independence	0	0		
		(B) Area: The tag shall be valid in the area described in subsection 364(d)(4)(A).			
(5)	Lone Pine Period 2	0	0		
		(B) Area: The tag shall be valid in the area described in subsection 364(d)(5)(A).			
(6)	Tinemaha	0	0		

§	(A) Hunts	1.	2.	3.	4.
		Bull Tags	Antlerless Tags	Either-Sex Tags	Spike Tags
		(B) Area			
		(B) Area: The tag shall be valid in the area described in subsection 364(d)(6)(A).			
(7)	West Tinemaha	0	0		
		(B) Area: The tag shall be valid in the area described in subsection 364(d)(7)(A).			
(8)	Tinemaha Mountain	0	0		
		(B) Area: The tag shall be valid in the area described in subsection 364(d)(8)(A).			
(9)	Whitney	0	0		
		(B) Area: The tag shall be valid in the area described in subsection 364(d)(9)(A).			
(10)	Goodale	0	0		
		(B) Area: The tag shall be valid in the area described in subsection 364(d)(10)(A).			
(11)	Grizzly Island	0	0		0
		(B) Area: The tag shall be valid in the area described in subsection 364(d)(11)(A).			
(12)	Fort Hunter Liggett	0	0		
		(B) Area: The tag shall be valid in the area described in subsection 364(d)(12)(A).			
(13)	East Park Reservoir	1	1		
		(B) Area: The tag shall be valid in the area described in subsection 364(d)(13)(A).			
(14)	San Luis Reservoir	2	3		
		(B) Area: The tag shall be valid in the area described in subsection 364(d)(14)(A).			
(15)	Bear Valley	1	1		
		(B) Area: The tag shall be valid in the area described in subsection 364(d)(15)(A).			
(16)	Lake Pillsbury	0	0		
		(B) Area: The tag shall be valid in the area described in subsection 364(d)(16)(A).			
(17)	Santa Clara	0			
		(B) Area: The tag shall be valid in the area described in subsection 364(d)(17)(A).			
(18)	Alameda	0			
		(B) Area: The tag shall be valid in the area described in subsection 364(d)(18)(A).			

REGULATORY TEXT

Section 364.1 is amended to read:

**§ 364.1. Department Administered Shared Habitat Alliance for Recreational Enhancement (SHARE) Elk Hunts**

... [No changes subsections (a) through (h)]

§	(A) Hunts	1.	2.	3.	4.
		Bull Tags	Antlerless Tags	Either-Sex Tags	Spike Tags
(B) Area					
<b>(i) Department Administered SHARE Roosevelt Elk Hunts</b>					
(1)	Siskiyou	2	2		
		(B) Area: The tag shall be valid in the area described in subsection 364(a)(1)(A).			
(2)	Northwestern	<del>7</del> <u>13</u>	<del>13</del> <u>34</u>	0	
		(B) Area: The tag shall be valid in the area described in subsection 364(a)(2)(A).			
(3)	Marble Mountain	0	0		
		(B) Area: The tag shall be valid in the area described in subsection 364(a)(3)(A).			
<b>(j) Department Administered General Methods SHARE Rocky Mountain Elk Hunts</b>					
(1)	Northeast California	<del>0</del> <u>2</u>	0	<del>0</del> <u>2</u>	
		(B) Area: The tag shall be valid in the area described in subsection 364(b)(1)(A).			
<b>(k) Department Administered SHARE Roosevelt/Tule Elk Hunts</b>					
(1)	Mendocino	2	4		
		(B) Area: The tag shall be valid in the area described in subsection 364(c)(1)(A).			
<b>(l) Department Administered SHARE Tule Elk Hunts</b>					
(1)	Cache Creek	1	1		
		(B) Area: The tag shall be valid in the area described in subsection 364(d)(1)(A).			
(2)	La Panza	5	10		
		(B) Area: The tag shall be valid in the area described in subsection 364(d)(2)(A).			
(3)	Bishop	0	0		
		(B) Area: The tag shall be valid in the area described in			

§	(A) Hunts	1.	2.	3.	4.
		Bull Tags	Antlerless Tags	Either-Sex Tags	Spike Tags
		(B) Area			
(4)	Independence	0	0		
		(B) Area: The tag shall be valid in the area described in subsection 364(d)(4)(A).			
(5)	Lone Pine Period 2	0	0		
		(B) Area: The tag shall be valid in the area described in subsection 364(d)(5)(A).			
(6)	Tinemaha	0	0		
		(B) Area: The tag shall be valid in the area described in subsection 364(d)(6)(A).			
(7)	West Tinemaha	0	0		
		(B) Area: The tag shall be valid in the area described in subsection 364(d)(7)(A).			
(8)	Tinemaha Mountain	0			
		(B) Area: The tag shall be valid in the area described in subsection 364(d)(8)(A).			
(9)	Whitney	0	0		
		(B) Area: The tag shall be valid in the area described in subsection 364(d)(9)(A).			
(10)	Goodale	0	0		
		(B) Area: The tag shall be valid in the area described in subsection 364(d)(10)(A).			
(11)	Grizzly Island	0	0		0
		(B) Area: The tag shall be valid in the area described in subsection 364(d)(11)(A).			
(12)	Fort Hunter Liggett	0	0		
		(B) Area: The tag shall be valid in the area described in subsection 364(d)(12)(A).			
(13)	East Park Reservoir	1	1		
		(B) Area: The tag shall be valid in the area described in subsection 364(d)(13)(A).			
(14)	San Luis Reservoir	2	3		
		(B) Area: The tag shall be valid in the area described in subsection 364(d)(14)(A).			
(15)	Bear Valley	1	1		

§	(A) Hunts	1.	2.	3.	4.
		Bull Tags	Antlerless Tags	Either-Sex Tags	Spike Tags
		(B) Area			
		(B) Area: The tag shall be valid in the area described in subsection 364(d)(15)(A).			
(16)	Lake Pillsbury	0	0		
		(B) Area: The tag shall be valid in the area described in subsection 364(d)(16)(A).			
(17)	Santa Clara	0			
		(B) Area: The tag shall be valid in the area described in subsection 364(d)(17)(A).			
(18)	Alameda	0			
		(B) Area: The tag shall be valid in the area described in subsection 364(d)(18)(A).			

Note: Authority Cited: Sections 332 and 1050, Fish and Game Code. Reference: Sections 332, 1050 and 1574, Fish and Game Code.

# DRAFT SUPPLEMENTAL ENVIRONMENTAL DOCUMENT

Section 364, 364.1, 555, and 601  
Title 14, California Code of Regulations

Regarding

# ELK HUNTING

SCH 2018112037

February 14, 2019



STATE OF CALIFORNIA  
THE RESOURCES AGENCY  
DEPARTMENT OF FISH AND WILDLIFE  
on behalf of the California Fish and Game Commission

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## CHAPTER 1. SUMMARY

### PROPOSED PROJECT AND ALTERNATIVES

The proposed project involves modifications to the current elk hunting regulations for the 2019-2020 elk hunting season and subsequent seasons until the Fish and Game Commission (Commission) adopts new regulations modifying tag limits. Specifically, the Commission proposes to:

- Increase the tag quota range (by 20 tags) in the Northwestern Elk Zone.
- Increase the individual quotas in the other zones, but within previously analyzed quota ranges
- Modify season dates for Fort Hunter Liggett consistent with section 3453 of the Fish and Game Code (FGC). No changes in tag quotas are proposed.

The analysis in the 2018 Draft Supplemental Environmental Document (DSED) focuses on the potential for any new significant or substantially more severe environmental impacts from the increase in tag quota range in the Northwestern Elk Zone. Impacts from any tag modifications within other zones in the state are analyzed within the 2010 Environmental Document (incorporated by reference, April, 2010 Final Environmental Document, SCH#200912083, available at 1812 9<sup>th</sup> Street, Sacramento, CA 95811). The Commission finds the analysis in the 2010 Environmental Document still contains informational value and is appropriate to use as a basis for the proposed quota changes in zones other than the Northwestern Elk Zone.

The Department of Fish and Wildlife (Department) also provides, and the Commission is considering, three alternatives to the proposed project that could feasibly attain the basic objectives of the project. Alternative 1 (no change) would maintain the existing analyzed harvest for the hunt zone without change. Alternative 2 (increased harvest) involves an increase of 60 tags (three times that of the proposed project). Alternative 3 (reduced harvest) involves a harvest increase of 10 tags (half that of the proposed project). Current and proposed harvest strategies generally allow for population growth through time. However, under the Increased Harvest alternative, population growth might be curtailed and/or decline slightly over time.

### SUMMARY OF IMPACTS AND MITIGATION

Table 1 summarizes the Commission findings of no significant long-term adverse impacts associated with the proposed project or any of the project alternatives considered for the 2019-20 elk hunting regulations.

Table 1. Impact Summary

<b>Alternative</b>	<b>Description</b>	<b>Significant Impact</b>	<b>Mitigation</b>
Proposed Project	Increase the tag quota range for the Northwestern Elk Zone by 20 tags	No	N/A
Alternative 1. No Project	No change from the 2018-19 hunting regulations	No	N/A
Alternative 2. Increase Tag Quota (3 x proposed project)	Increase the tag quota range for the Northwestern Elk Zone by up to 60 tags	No	N/A
Alternative 3. Reduced Proposal (half of Proposed Project)	Increase the tag quota range for the Northwestern Elk Zone by 10 tags	No	N/A

Based on success rates from previous years, the Department expects that the actual harvest will range from 80-95 percent of the elk tags allocated for 2019 (CDFW, 2018).

State role in establishing elk hunting regulations

The DSED is intended to support the actions of the Commission as it considers regulations pertinent to conservation and providing public recreational opportunities. The Commission has prepared this document to analyze the potential of any new significant or substantially more severe environmental impacts than were previously disclosed in an Environmental Document prepared in 2010. These actions are consistent with the wildlife conservation policy adopted by the Legislature as set forth in Section 1801, FGC. The State's wildlife conservation policy, among other things, specifies an objective of providing hunting opportunities consistent with maintaining healthy wildlife populations.

Elk hunting regulations adopted by the Commission are set forth in Sections 364, 364.1, and 555, Title 14, California Code of Regulations (CCR), and enforced by the Department. These regulations are authorized under the following statutes:

Section 203, FGC, authorizes the Commission to regulate game mammals in the state.

Section 203.1, FGC, requires the Commission to consider populations, habitat, food supplies, the welfare of individual animals, and other pertinent facts when adopting hunting regulations for elk.

Section 332, FGC, provides that the Commission may determine and fix the area or areas, the seasons and hours, the bag and possession limit, and the number of elk that may be taken under rules and regulations that the commission may adopt from time to time.

Sections 3950 -3952, FGC, designate elk (genus *Cervus*) as a game mammal in California; authorizes the Commission to regulate take (harvest) of elk; and requires the Department to prepare an elk management plan.

FGC Section 3952 was adopted in 2003 and requires the Department to develop a statewide approach for management of elk. FGC Section 1801 is the Department's Conservation of Wildlife Resources Policy, to encourage preservation, conservation and maintenance of wildlife resources under the jurisdiction and influence of the state. This section also provides objectives for the policy that include:

- Providing for the beneficial use and enjoyment of wildlife
- Perpetuating all species for their intrinsic value
- Providing aesthetic, educational and non-appropriative uses
- To maintain diversified recreational uses
- To provide economic contributions
- To alleviate economic losses

FGC Section 1802 gives the Department jurisdiction over the conservation, protection and management of fish, wildlife and native plants, and the habitat necessary for biologically sustainable populations of those species. FGC Section 3952 directs the Department to develop a statewide elk management plan, consistent with the Conservation of Wildlife Resources Policy, and maintain sufficient elk populations in perpetuity, while considering the following:

- Characteristics and geographic range of each elk subspecies within the state, including Roosevelt elk, Rocky Mountain elk, and tule elk
- Habitat conditions and trends within the state
- Major factors affecting elk within the state, including, but not limited to, conflicts with other land uses
- Management activities necessary to achieve the goals of the plan and to alleviate property damage
- Identification of high priority areas for elk management
- Methods for determining population viability and the minimum population level needed to sustain local herds
- Description of the necessary contents for individual herd management plans prepared for high priority areas

An Elk Conservation and Management Plan (CDFW 2018) describes historical and current geographic range, habitat conditions and trends, and major factors affecting

Roosevelt, Rocky Mountain and tule elk in California. It identifies, delimits and describes high priority areas and actions for elk management, referred to as Elk Management Units (EMUs) and establishes broad conservation and management objectives. The plan provides guidance and direction to help set priorities statewide, and establishes general policies, goals and objectives, on a statewide scale. Individual EMU documents address issues specific to the units, establish population objectives and future management direction.

The 2018 Elk Hunting DSED sets forth the findings of the Commission, based on recommendations from the Department, and the Commission's proposal for regulatory changes.

## **TRIBAL COORDINATION**

The Department is committed to developing and maintaining an effective, positive and cooperative relationship with California federally recognized Tribes (Tribes) regarding elk management. In order to achieve the goals regarding California's elk populations, innovative management actions and collaboration will be required, and guidance from a statewide elk management plan (management plan) is necessary to help mediate competing and conflicting interests and assure the conservation, protection, restoration, enhancement and reestablishment of California's elk populations and habitat. This is critical to providing cultural, scientific, educational, recreational, aesthetic and economic benefits for present and future generations of Californians.

A letter to Tribal Representatives on November 7, 2018 provided notification of the Department's proposal to amend hunting regulations for elk pursuant to the California Environmental Quality Act (CEQA), Public Resources Code Section 21080.3.1. The letter described opportunities to provide input to the proposed regulations through consultation pursuant to Public Resources Code sections 21080.3.1 and 21030.3.2, or during the public comment period for release of this Draft Supplemental Environmental Document.

## **AREAS OF CONTROVERSY**

A Notice of Preparation (NOP) for the proposed project was prepared and circulated on November 13, 2018. The Department presented information on potential changes to elk hunting regulations at the September 20, 2018 Wildlife Resources Committee (WRC) meeting held in Sacramento. One scoping meeting, held from 12:00 P.M. to 1:00 P.M. on Friday November 30, 2018 was also conducted at the Department's Wildlife Branch located at 1812 9th Street, Sacramento CA 95811.

The WRC meeting provided information to the Committee, public and Commission staff about potential changes being considered and evaluated. The scoping meeting solicited input from the public and interested public agencies regarding the nature and scope of the environmental impacts to be addressed in the DSED. At the beginning of

each meeting, staff presented an overview of the existing program, the objectives of the proposed project, the legal background leading to this DSED, and the CEQA process generally. During the scoping meeting, participants also were encouraged to submit written comments, or to submit additional comments by mail or email before close of the comment period on December 14, 2018. Three members of the public attended the meeting. No areas of controversy regarding the proposed project were identified at the meeting.

Attendees:

<b>Name</b>	<b>Affiliation</b>	<b>Email</b>
Victoria Barr	CDFW	<a href="mailto:Victoria.barr@wildlife.ca.gov">Victoria.barr@wildlife.ca.gov</a>
Brad Burkholder	CDFW	<a href="mailto:Brad.burkholder@wildlife.ca.gov">Brad.burkholder@wildlife.ca.gov</a>
Nick Villa	CRPA	<a href="mailto:nvilla@CRPA.ORG">nvilla@CRPA.ORG</a>
Joe Hobbs	CDFW	<a href="mailto:Joe.hobbs@wildlife.ca.gov">Joe.hobbs@wildlife.ca.gov</a>
Rose Sanchez	CSUS	<a href="mailto:rosesanchez@csus.edu">rosesanchez@csus.edu</a>
Ari Cornman	FGC	<a href="mailto:ari.cornman@fgc.ca.gov">ari.cornman@fgc.ca.gov</a>
Jessica Whalen	None	<a href="mailto:jnw179@humboldt.edu">jnw179@humboldt.edu</a>
Jon Fischer	CDFW	<a href="mailto:Jon.fischer@wildlife.ca.gov">Jon.fischer@wildlife.ca.gov</a>
Regina Vu	CDFW	<a href="mailto:Regina.vu@wildlife.ca.gov">Regina.vu@wildlife.ca.gov</a>
Julie Garcia	CDFW	<a href="mailto:Julie.garcia@wildlife.ca.gov">Julie.garcia@wildlife.ca.gov</a>
Andrew Trausch	CDFW	<a href="mailto:Andrew.trausch@wildlife.ca.gov">Andrew.trausch@wildlife.ca.gov</a>

Oral Comments

Nick Villa requested more junior only elk hunts. No other comments were received during the scoping meeting.

Written Comments Received During 30-Day Comment Period

In total, three emails and three letters were received from six distinct individuals during the scoping process. Individual letters or emails often contained more than one scoping-related comment; these have been separated out and grouped accordingly.

- 1) Two emails requested completion of the statewide elk management plan before changes to the current elk hunting program were implemented.
- 2) One email requested: to please provide to the requestor as well as the public scientific research that supports the Department's proposal to kill more elk is biologically sound.
- 3) One email stated: a majority of elk tags should be awarded through random draw instead of using preference points; lack of hunter recruitment and retention is one of many factors that will negatively impact conservation efforts in the future; a lack of opportunity is the leading cause of lack of hunter retention; and I am not sure what it would take to markedly improve the number of elk in California, but

whatever habitat work or predator control that can be done to increase elk numbers should be taken into consideration and made a top priority.

- 4) One letter outlined the CEQA requirements the Department needs to comply with.
- 5) One email stated: Tribal hunting should be the first and highest priority for existing hunting tags; Separate the Northwestern Elk Zone into two elk zones, Del Norte County and Humboldt County; and Roosevelt elk in the Northwest, CA Hunt Zone are genetically pure or unique They also requested:
  - a) Present in detail, all elk population data collected to date and used as a basis for any proposed increase in hunting tags.
  - b) Present all data showing how many elk are actually killed each year in each program including PLM and SHARE, Tribal hunts, and including poached elk (e.g. recent 2018 poaching in Redwood National & State Parks; 2018 apprehended poachers in Gilbert Creek area) and road kill. Please show respective locations on a map, or at least break out by County and general areas within counties.
  - c) We request improved transparency throughout the process. Proposed numbers of tags and categories for all hunts: General, SHARE, PLM, Apprentice, Tribal, etc. should easily accessible such that a given agency, region or county can grasp and analyze the impacts to their region, county or neighborhood. These proposed quotas should be locally published well before the Commissioners' meeting dates so communities have a greater opportunity to voice their support or concerns.
  - d) Indicate which elk population data are based on actual field counts, surveys and other methods involving actual sighting or handling of the elk by authorized personnel -- and which population data are projected from field data by mathematical formulas and other methods in use by the Humboldt State University (HSU) /CDFW team (and/or other experts consulted by this team).
  - e) Explain clearly which of these methods for projecting elk population numbers are being used; where else and by whom these methods are in use, and to what extent these projection methods have been published and peer-reviewed.
  - f) Note if any portion of the population counts/data is based directly on reports/counts from the public (or local businesses or ranches etc.).
  - g) Chart the progression or changes in estimated elk population numbers and/or databased population numbers over the last 10 years, and over the last 150 years.
  - h) Explain how proposed hunting tag increases will fulfill the existing or draft Elk Management Plan population goals for this region.
  - i) Discuss how elk are significantly impacted by recent fires in surrounding areas of Southern Oregon and Northern California, and how this combined with any proposed increased hunting pressure impacts the elk in the Northwestern CA Hunt Zone.

- j) We should compensate by allowing elk to increase their numbers and find refuge in nearby areas such as ours, to compensate for losses in elk or elk habitat.
- k) Explain all reason(s) including biological justification for the proposed increase in elk tags when the HSU/CDFW data gathering and studies are not complete, have not been published, released, or peer-reviewed.
- l) CDFW is proposing for the 2018 Elk Tag Allocation adjustments within the quota ranges allowed under the old outdated elk management plan, a plan not supported by scientific evidence.
- m) Show how the proposed increase in tags is spread over the categories of General Hunt; PLM; SHARE, and the allocation for Tribal Hunts/Tags. Please show respective locations on a map, or at least break out by County and general areas within counties.

*Note: No comments were received that pertained directly to Aesthetics, Agriculture and Forestry Resources, Air Quality, Cultural Resources, Geology/Soils, Greenhouse Gas Emissions, Hazards and Hazardous Materials, Hydrology and Water Quality, Land Use/Planning, Mineral Resources, Noise, Population/Housing, Public Services, Recreation, Transportation/Traffic, Tribal Resources, or Utilities/Service Systems.*

## **RESOURCE AREAS ANALYZED IN THIS DOCUMENT**

This DSED analyzes the potential for significant impacts to Biological Resources and Recreation, as well as Cumulative Impacts. After using an initial study (Appendix 1), in combination with the comments received during the scoping period, to evaluate the potential environmental impacts of the project, the other resource areas were eliminated based on the Commission's determination that there was no potential for significant impact in those areas.

## **ISSUES TO BE RESOLVED**

As provided by existing law, the Commission is the decision-making body (lead agency) considering the proposed project, while the Department has responsibility for management activities, such as hunting, translocating elk to suitable historic range, and preparing management plans. The primary issue for the Commission to resolve is whether to change elk hunting regulations as an element of elk management. If such changes are authorized, the Commission will specify the areas, seasons, methods of take, bag and possession limit, number of elk to be taken, and other appropriate special conditions.

## **FUNCTIONAL EQUIVALENCY**

The California Environmental Quality Act (CEQA) requires all public agencies in the State to evaluate the environmental impacts of projects they approve, including

regulations, which may have a potential to significantly affect the environment. The Department, on behalf of the Commission has prepared this DSED, which is the functional equivalent of a Supplemental Draft Environmental Impact Report (as discussed in Public Resources Code section 21166). The DSED provides the Commission, other agencies, and the general public with an objective assessment of the potential new significant or substantially more severe environmental impacts than were previously disclosed in the 2010 Environmental Document effects.

Generally, the Commission's CEQA review of proposed project adopting a regulatory change is conducted in accordance with the Commission's certified regulatory program (CRP) approved by the Secretary for the California Resources Agency pursuant to Public Resources Code section 21080.5 (See generally CCR Title 14, sections 781.5, and 15251(b)). The 2010 Environmental Document fell under the Commission's CRP. Because Public Resources Code section 21166 does not fall within the limited exception for CRPs provided by section 21080.5, the Commission has prepared this DSED and conducted related environmental review of the proposed program in accordance with CEQA generally, also following the rulemaking process for regulations as set forth in the Commission's CRP and the Administrative Procedure Act (Government Code Section 11340 et seq.).

In addition, pursuant to Section 15087 of the CEQA Guidelines, this DSED is available for public review for 45 days. During the review period, the public is encouraged to provide written comments regarding the environmental document to the Department of Fish and Wildlife, Wildlife Branch, 1812 9th Street, Sacramento, California 95811. Comments must be received by the Department by 5:00 p.m. on April 5, 2019.

Written and oral comments received in response to the DSED will be addressed in a Response to Comments document, which, together with the DSED, will constitute the Final Supplemental Environmental Document. In addition, the Commission will consider the comments received pursuant to the Administrative Procedure Act addressing the proposed regulations. The rulemaking process under the Administrative Procedure Act to promulgate regulations is running concurrently with this environmental review pursuant to CEQA. Once completed, the Final Supplemental Environmental Document will inform the Commission's exercise of discretion as lead agency under CEQA in deciding whether or how to approve the proposed project as described in this document and the proposed regulations.

## CHAPTER 2. THE PROPOSED ACTION

The proposed project being considered consists of the following modification to existing elk hunting regulations.

### 1. Increase the Tag Range in the Northwestern Elk Zone

In order to maintain hunting quality in accordance with management goals and objectives, it is periodically necessary to adjust quotas in response to dynamic environmental and biological conditions. This proposed project adjusts the elk tag range (Appendix 2) to account for fluctuations in population numbers, increased property damage, and hunting pressure.

The increase in tags will allow the Department to distribute hunting pressure to address landowner concerns over elk damage and increase opportunity while providing a biologically appropriate harvest within the Northwestern elk zone. Bull (0-28), antlerless (0-34), and either-sex (0-3) tags would be available to the public during the Northwestern elk hunt and through the SHARE Program.

Elk Pop (Smith and Updike 1987) is a microcomputer-based model developed by the Department for the purpose of analyzing harvest alternatives. Elk Pop was used to assess effects of the proposed project (and project alternatives) on the specific Roosevelt elk herd where increased tags are proposed. The model allows the user to vary carrying capacity to reflect real-world changes in habitat. Population age and sex ratios (observed and estimated) are primary inputs to the model. Elk Pop allows analysis of multiple harvest alternatives simultaneously and is easily adapted to most herd situations.

Elk Pop utilizes data on age and sex composition of the herd, maximum calf survival, estimated population numbers, nonhunting mortality, and hunting mortality. Age and sex composition and maximum calf survival figures used in the model are based on observed and estimated rates. Population level and nonhunting mortality rates were estimated. Estimates of nonhunting mortality rates were considered valid representations of actual nonhunting mortality rates when the model predicted the observed herd composition ratios for 10 consecutive years. Effects of various harvest scenarios were then predicted on the basis of composition ratios and estimated nonhunting mortality rates. The computer model runs for various harvest scenarios (proposed project and the alternatives) for the Northwestern elk zone can be found in Appendix 3.

### 2. Changes in tag quotas for other hunting zones in the state

Proposed changes to tag quotas in other hunting zones in the state fall within the tag quota ranges that were analyzed within the 2010 Environmental Document. The analysis in this DSED focuses on any new significant or substantially more severe

environmental effects from increasing the tag quota ranges in the Northwestern Elk Zone. There are no anticipated significant or substantially more severe environmental effects for the other hunting zones than were previously evaluated in the 2010 document.

## **BACKGROUND AND EXISTING CONDITIONS**

### **THE MANAGEMENT OF ELK IN CALIFORNIA**

There are three subspecies of elk in California: Roosevelt, Rocky Mountain, and tule elk. Roosevelt elk occupied the Cascade and Coast mountain ranges as far south as San Francisco (Harper et al. 1967), and eastward at least to Mount Shasta (Murie 1951). Tule elk were distributed throughout the Central, Sacramento and San Joaquin valleys and the grasslands and woodlands of central California's Coast Range (McCullough 1969). Although there appears to be disagreement regarding their subspecific status, both Murie (1951) and McCullough (1969) included portions of Shasta, Siskiyou and Modoc counties in northeastern California within the historical range of Rocky Mountain elk. Further clarification of the historical and current subspecific status of elk in northeastern California is unlikely because of the translocation of Rocky Mountain elk to the Pit River area in the early 1900s. However, predictions of genetic flow across the landscape supported by the journal entries of early American explorers suggest that elk have been endemic to northeastern California for thousands of years. Locations where historical specimens of Rocky Mountain elk have been recovered have helped scientists map the probable routes taken by these highly mobile ungulates as they populated North America (McCullough 1969).

Because of their large body size and the availability of smaller prey, it is unlikely that Native Americans had a significant impact on elk populations in California. Early explorers also had little direct impact on elk populations. Apparently they preferred domestic livestock to elk (McCullough 1969). However, these early explorers were responsible for the introduction of exotic annual grasses and domestic livestock, both of which had long-term, deleterious impacts on California's elk populations. Livestock competed directly with elk for forage and contributed to the conversion of the native perennial grasslands to annual grasslands, which resulted in the loss of important forage plants used by elk during the summer and fall months.

#### Historical Perspective of Roosevelt Elk Management

Although once widely distributed throughout northern California, by the late 1800s, Roosevelt elk were extirpated throughout much of their historic California range. Barnes (1925a, 1925b) reported that by 1925, Roosevelt elk range in California was reduced to one small area in Humboldt and Del Norte counties. Mining, logging, agriculture, and market shooting were factors that contributed to the decimation of Roosevelt elk in much of California. Because of their large body size and herding

behavior, elk were vulnerable to market shooting. Harper et al. (1967) discussed the historical distribution of Roosevelt elk in California and reported that by 1967 the population was increasing in size and in no danger of extinction.

Based on the current distribution of Roosevelt elk in California (Appendix 4), population growth and range expansion has continued since 1967. Through U.S. Forest Service and Bureau of Land Management district planning, habitat management efforts have resulted in significant Roosevelt elk population increases during the 20th century. Roosevelt elk herds in California are now healthy and viable. Populations of Roosevelt elk currently exist in the coastal areas of Mendocino, Humboldt, and Del Norte counties, in addition to the Cascade and Klamath mountain ranges in Siskiyou and Trinity counties. Some of these populations were established when the Department (in cooperation with other State and Federal agencies) relocated elk to suitable historic range. Other populations were established when elk moved into California from Oregon. Additionally, new populations have become established through the dispersal of elk from existing populations to adjacent suitable areas. The Department currently estimates the statewide Roosevelt elk population at approximately 5,700 individuals. This estimate is based on field observations, and professional judgment and experience obtained in studying elk throughout California. The Department has determined this estimate of total population size is reasonable.

Roosevelt elk use forested habitat types, where they are often impossible to see from a helicopter because of the dense forest canopy. For this reason, helicopter-assisted capturing of Roosevelt elk is generally not effective in California. Nevertheless, successful Roosevelt elk translocations have occurred when large groups have been captured in Redwood National Park or on winter range in Oregon. Since 1985, the Department has translocated more than 280 Roosevelt elk to reestablish populations in portions of southern Humboldt, Mendocino, Siskiyou, and Trinity counties.

### Existing conditions regarding elk hunting

Regulated public hunting for Roosevelt elk has occurred annually in California since 1986, whereas annual hunting for Rocky Mountain elk began in 1987. Public tule elk hunting has been authorized by the Commission annually since 1989. Additional public hunts for Roosevelt, Rocky Mountain and tule elk have been established subsequent to 1986, and annual elk hunting began within portions of the Northwestern Unit in 1993. Appendix 5 lists the verbatim for the current elk hunting regulations in California.

### PLM Hunts (Section 601, Title 14, CCR)

The PLM Program was authorized by the Legislature to protect and improve wildlife habitat by encouraging private landowners to manage their property to benefit fish and wildlife. Economic incentives are provided to landowners through biologically sound yet flexible seasons for game species, resulting in high-quality hunting opportunities which may be marketed by the landowner in the form of fee hunting and other forms of

recreation. Section 601, Title 14, CCR, contains regulations adopted by the Commission pertaining to the program, and sections 3400-3409, FGC, contain the subject statutes.

Landowners have the right to charge access fees for hunting, fishing, and other recreation on their property. The Department carefully reviews each plan to ensure that required habitat improvement efforts benefit many species of wildlife and that harvest strategies comply with accepted goals and objectives for management of the game species involved. The PLM Program further allows the Commission to authorize hunting and fishing seasons and bag limits specific to licensed PLM areas pursuant to approved management plans.

The PLM Program currently is an element of the Department's elk management program. During 2018, nine landowners offered opportunities to hunt Roosevelt elk through the PLM Program in Del Norte and Humboldt counties. The proposed project does not involve increasing elk tags in the PLM Program (Appendix 6).

#### Cooperative Elk Hunting Area hunts (Section 555, Title 14, CCR)

To encourage protection and enhancement of elk habitat and provide eligible landowners an opportunity for limited elk hunting on their lands, the department may establish cooperative elk hunting areas and issue license tags to allow the take of elk (Appendix 7 - Section 555, Title 14, CCR). In 2018, three Cooperative Elk Hunting Area elk tags were issued in the Northwestern elk zone.

### **POLICY CONSIDERATIONS**

The Legislature formulates laws and policies regulating the management of fish and wildlife in California. The general wildlife conservation policy of the State is to encourage the conservation and maintenance of wildlife resources under the jurisdiction and influence of the State (Section 1801, FGC). The policy includes several objectives, as follows:

1. To provide for the beneficial use and enjoyment of wildlife by all citizens of the State;
2. To perpetuate all species of wildlife for their intrinsic and ecological values, as well as for their direct benefits to man;
3. To provide for aesthetic, educational, and non-appropriative uses of the various wildlife species;
4. To maintain diversified recreational uses of wildlife, including hunting, as proper uses of certain designated species of wildlife, subject to regulations consistent with the maintenance of healthy, viable wildlife resources, the public safety, and a quality outdoor experience;
5. To provide for economic contributions to the citizens of the State through the recognition that wildlife is a renewable resource of the land by which

economic return can accrue to the citizens of the State, individually and collectively, through regulated management. Such management shall be consistent with the maintenance of healthy and thriving wildlife resources and the public ownership status of the wildlife resource;

6. To alleviate economic losses or public health and safety problems caused by wildlife; and
7. To maintain sufficient populations of all species of wildlife and the habitat necessary to achieve the above-stated objectives.

## **GLOBAL CLIMATE CHANGE**

Climate changes caused by increasing atmospheric concentrations of greenhouse gases are expected to result in marked changes in climate throughout the world (deVos, and McKinney, 2007). Although many wildlife habitats in North America have become progressively warmer and drier in the last 12,000 years, the greatest rate of change has occurred during the last 150 years (Fredrickson et al. 1998). Predicted changes due to continued warming include increased frequency and severity of wildfires, increased frequency of extreme weather events, regional variation in precipitation, northward and upward shifts in vegetative communities, and replacements of biotic communities. These changes are expected to affect abundance, distribution, and structure of animal and vegetative communities.

Local and specific regional changes in climate and associated changes in vegetative communities will be the determining factors regarding the distribution and abundance of elk in California. Although research specific to elk responses to climate change is limited, what information does exist indicates that both adverse and beneficial effects - depending on a variety of local/regional factors such as latitude, elevation, topography, and aspect – can be expected to result. For example, in the Rocky Mountain National Park where snow accumulation currently limits elk winter range, computer simulations suggest a reduction in future snow accumulations of up to 25-40%. An expansion of winter range would serve to increase over-winter survival and recruitment of juveniles into the adult population, leading to an increase of the overall elk population in that area (Hobbs et al. 2006). Conversely, research in Banff National Park, Canada indicates climate change will result in colder winter temperatures, increased snowfall, and a higher frequency of winter storms (Hebblewhite 2005). These factors would result in a decrease in over-winter survival and recruitment, leading to an overall reduction of the elk population for that area.

Hunting seasons and tag quotas are proposed to the Commission who has the authority for adopting regulations on an annual basis. These seasons and quotas are based on annual population and harvest data, annual population model results, and area-specific population/harvest objectives. Although the impact of climate change on California's elk population is difficult to predict and warrants continued study, the Department and the Commission have the ability to quickly respond to population fluctuations (positive or negative) by increasing or decreasing hunter opportunity in accordance with current and

future management objectives for this species. However, reducing one mortality factor (sport hunting) will not alone mitigate for impacts associated with global climate change; the ability to manage and provide adequate amounts of required habitats is the ultimate deciding factor in wildlife populations.

**POTENTIAL FOR SIGNIFICANT EFFECTS**

The Commission has determined the proposed project will not have any long-term significant impact on the environment. The analysis included here and discussed below addresses the potential for significant effects on the gene pool, impacts on social structure, effects on habitat, effects on recreational opportunities, effects on other wildlife species, effects on public safety, growth inducing impacts, short-term uses and long term productivity, significant irreversible environmental changes, welfare to the individual animal, and cumulative impacts. Although not a resource category where CEQA requires analysis, for informational value the Commission has also analyzed the potential for effects on economics from the proposed project. Each of these areas are discussed in more detail below.

The proposed project allows an increase in already limited public hunting of Roosevelt elk in portions of Del Norte and Humboldt counties. In 2018, 88 elk tags were issued in Del Norte and Humboldt through the General Draw, PLM, SHARE and the Cooperative Elk Hunting Program. Table 2 shows the 2018 harvest including PLM, SHARE, and Cooperative Elk Hunting. The proposed project will result in increasing the total tags to allow removal of up to 108 Roosevelt elk.

Table 2. 2018 Northwestern Elk Zone Total Tags and Reported Harvest (Includes General, SHARE, Cooperative, and PLM)

<b>2018 Elk Tags Issued</b>					
	<b>Issued</b>			<b>Harvested</b>	
	<b>Bull</b>	<b>Antlerless</b>	<b>Either-sex</b>	<b>Bull</b>	<b>Antlerless</b>
<b>General</b>	15	0	3	18	0
<b>PLM</b>	21	19	0	19	16
<b>SHARE</b>	5	22	0	5	19
<b>Cooperative</b>	3	0	0	3	0
<b>Totals</b>	<b>44</b>	<b>41</b>	<b>3</b>	<b>45</b>	<b>35</b>

Elk hunting will result in the death of individual animals. The removal of individual animals from selected herds, which are relatively large and healthy, will not significantly reduce herd size on a long-term basis. Production and survival of young animals within each herd will replace the animals removed by hunting (Fowler 1985, Racine et al. 1988). Analysis of current levels of take is contained in the 2010 Environmental Document, and found to have no significant impact for all levels of take within the analyzed quota range. Since the changes proposed in this project will only increase

public elk hunting in one of the State's elk hunt zones, removal of individuals will have little influence on the statewide elk population. Therefore, the proposed action of increasing the tag quotas by 20 removing no more than approximately 68 elk by public hunting (general, SHARE, and Cooperative hunts) and 40 elk through the PLM Program will not have a significant adverse impact on either local or statewide elk populations. The Department does not anticipate issuing up to the maximum number of tags in most hunt zones but the Commission has assumed the maximum level of take in its analysis of the potential impact under the proposed project.

As discussed in more detail below, the Commission has concluded the proposed project will not have a significant adverse effect on the environment. No mitigation measures for the proposed project or alternatives are necessary.

### Methodology

A computer model which simulates herd performance (Smith and Updike 1987) was used to assess effects of the proposed action and alternatives (Appendix 3) on the elk hunt zones where a tag change is proposed.

A variety of natural and human-induced factors combine to affect the status of a wildlife population. Natural factors affecting elk populations include, but are not limited to, such things as predation, starvation, disease, and parasitism. Environmental factors (e.g., precipitation) can affect food quantity and quality, thereby affecting elk populations. Theoretically, competition among members of the same species and between different species (e.g., deer, elk) also can affect elk populations. Catastrophic events (e.g., wildfires) can affect localized populations on a short-term basis. Human-induced factors, such as urbanization and agricultural development, also affect elk populations. Hunting can affect a population in various ways, depending on the intensity and level of harvest.

Modern wildlife management uses models to analyze, understand, and predict the outcomes and complex interactions of the natural environment. Like many other technical fields that affect society, such as chemical engineering, aerospace technology, and climatology, the science of wildlife management has found that the use of models is invaluable for predicting the effects of human-induced and natural events on wildlife and their habitat.

Population models can range from simple word models (the statement "elk are born, grow up, reproduce and die" is a grossly simple word model of a population process) to highly complex and sophisticated mathematical abstractions. Some models are empirical (that is, based on observed data), and others are theoretical. Many models are useful in helping to frame conceptualizations of population processes, resulting in testable predictions about the subject at hand. Nevertheless, the goal of a model is to aid in analyzing known facts and relationships that would be too cumbersome or time consuming to analyze manually. Some of these models describe specific systems in a

very detailed way, and others deal with general questions in a relatively abstract fashion. All share the common purpose of helping to construct a broad framework within which to assemble an otherwise complex mass of field and laboratory observations. Though we often think of models in terms of equations and computers, they can be defined more generally as any physical or abstract concepts of the structure and function of "real systems" or natural occurrences.

Key in the development and use of any model is its reliability. The models used in this document have been developed based on field observation, published literature, and/or expert opinion. They have been tested against known results and are consistent.

### Compensatory Response

The Stock-Recruitment model (Ricker 1954, McCullough 1984) is useful for conceptualizing compensatory mechanisms and density-dependent responses that are believed to occur in wildlife populations. This model shows population responses to changes in density in terms of net recruitment (i.e., the survival of calves). It has the advantage of not requiring assumptions about internal birth and death rates, and it can be empirical.

The fundamental assumption of the Stock-Recruitment model is that calf survival is a function of population density and decreases as density increases (the converse is also true). There is a large body of evidence indicating that this is the case among populations of elk (McCullough 1979, Clutton-Brock et al. 1982). Thus, density can be measured in either absolute or relative terms, and with net recruitment one can begin to build a model that will allow predictions of the population's response to changes in density.

At a low population size, even with a high recruitment rate, few new individuals enter the population, but their survival is higher. As population size increases, so does the number of recruits, up to a certain level. The rate of recruitment decreases as a result of reduced survival of young. The degree of elk harvest necessary to achieve maximum sustained yield (MSY) can be expected to result in low population densities. Objectives to maximize residual population size and MSY are necessarily mutually exclusive. This has important implications for harvest management, as harvesting to achieve MSY suppresses the total population below its maximum potential. Spring population size (after calves are born) is thus below the carrying capacity of the range (McCullough 1984).

At high densities, the pre-mortality population will temporarily exceed carrying capacity (if an area is at carrying capacity – few of California's elk populations are believed to be at carrying capacity), resulting in possible habitat damage. When population sizes are at or near the range carrying capacity, yield will be low (proportionately), because recruitment of calves is low relative to herds at lower density. In such cases, increases

in harvest result in increased net recruitment, and the population will stabilize at a new population size if the new harvest level remains fixed (McCullough 1984).

Elk Pop (Smith and Updike 1987) is a microcomputer-based model which was developed by the Department for the purpose of analyzing harvest alternatives. Elk Pop was used to assess effects of the proposed project (and project alternatives) on the specific Roosevelt elk herds where hunting is proposed. The model allows the user to vary carrying capacity to reflect real-world changes in habitat capability. Observed population age and sex ratios are primary input to the model. Elk Pop allows analysis of multiple harvest alternatives simultaneously and is easily adapted to most herd situations.

Elk Pop utilizes data on age and sex composition of the herd, maximum calf survival, estimated population numbers, nonhunting mortality, and hunting mortality. Age and sex composition and maximum calf survival figures used in the model are based on actual observed rates. Population level and nonhunting mortality rates were estimated. Estimates of nonhunting mortality rates were considered valid representations of actual nonhunting mortality rates when the model predicted the observed herd composition ratios for 10 consecutive years. Effects of various harvest scenarios were then predicted on the basis of observed composition ratios and estimated nonhunting mortality rates. The computer model runs for various harvest scenarios (proposed project and the alternatives) for each elk herd where hunting is proposed can be found in Appendix 3.

## **IMPACTS OF HUNTING ON ELK POPULATIONS**

Elk hunting will result in the death of individual animals. The removal of individual animals from selected herds which are relatively large and healthy will not significantly reduce herd size on a long-term basis. Production and survival of young animals within each herd will replace the animals removed by hunting (Fowler 1985, Racine et al. 1988). Analysis of current levels of take, as well as the proposed levels of take for hunt zones statewide is contained in the 2010 Environmental Document, and found to have no significant impact for all levels of take within the analyzed quota range. Since the changes proposed in this project will only increase public elk hunting in one of the State's elk hunt zones, removal of individuals will have little influence on the statewide elk population. Therefore, the proposed action of increasing the tag quotas by 20 (removing no more than approximately 68 elk by public hunting (general, SHARE, and Cooperative hunts) and removing no more than 40 elk through the PLM Program will not have a significant adverse impact on either local or statewide elk populations.

Numbers of elk harvested by hunters in the PLM, public and Cooperative Elk Hunting programs in Del Norte and Humboldt counties during 2018 are reported in Table 2.

## Northwestern Roosevelt Elk Herds (Del Norte and Humboldt)

The proposed project for the Northwestern zone could result in an increase in 20 elk being harvested (for a maximum of 108) including, General, PLM, SHARE, and Cooperative elk tags. Computer simulation runs of this harvest scenario predict population numbers would increase (Appendix 3), based on the current conservative population estimate of 1,600 elk. The bull-to-cow ratio would remain stable, while the calf-to-cow ratio would increase.

The Commission, based on information provided by the Department, does not anticipate this proposed harvest scenario will result in adverse impacts to the Northwestern Roosevelt elk herd. Since 2016, the Department has been working towards implementation of systematic elk surveys in this zone. While development and implementation of those surveys to improve population assessments are ongoing, initial counts suggest a healthy and growing population. Direct counts within a portion of the zone from 2016 to 2017 resulted in a minimum count of 990 elk in 22 distinct groups (CDFW 2018). Over the past two years, efforts looking at movements of GPS collared elk, composition counts, and calf survival suggest a ten percent increase in the total number of elk in portions of the Northwestern elk hunt zone. In addition, the calf:cow ratio has been stable at 32 and 34 calves to 100 cows, and the bull:cow ratio has increased from 21 to 31 bulls to 100 cows. Within this portion of the zone, consisting of primarily private lands where conflicts and property damage continue to increase, the Department collared 58 calves from 2017 to 2018 to investigate calf survival. Initial analysis suggests juvenile survival was high, and when combined with the increase in observed count data, and the high calf:cow ratio, it indicates a growing population.

Allocation of tags through the SHARE program to focus recreational harvest in certain areas can help alleviate landowner conflicts, and the harvest in recent years has occurred primarily in these areas of the hunt zone. Increasing population trends suggest the population can sustain the proposed level of hunting and continue to grow. Through landowner cooperation, the SHARE program results in harvest totaling up to nearly half the total general tags available. As currently designed, the SHARE program allows focused elk harvest restricted to specific ranches or farms rather than across the entire hunt zone.

To simulate effects of the proposed quota increase for Northwestern California, the Department, using the minimum count of 990 from only a portion of the entire zone, conservatively assumes the current population size is 1,600 elk and carrying capacity is estimated at 1,760 elk across the entire zone. Elk populations are growing and expanding within the unit and both current population size and biological carrying capacity are likely much larger than these respective estimates.

## Other Hunting Zones Statewide

The levels of take for all other hunting zones statewide are analyzed in the 2010 Environmental Document. The Commission finds there are no new significant or substantially more severe environmental effects than were previously evaluated in that document, and were determined to be insignificant.

### **IMPACTS ON THE GENE POOL**

The Department estimates there are a minimum of 5,700 Roosevelt elk distributed throughout several areas of northern California. The proposed project would allow an increased statewide take of 20 Roosevelt elk (for total statewide take of approximately 318 Roosevelt elk). Assuming a condition where all tagholders are successful, this would result in a short-term reduction of approximately six percent of the statewide Roosevelt elk population. This does not constitute a significant impact to the statewide gene pool and is well within the population's ability to maintain or increase size over the long term.

It is expected that not more than 255 elk (Rocky Mountain, Roosevelt, and Tule elk combined) will be taken by hunters under the PLM Program during 2019. This constitutes just over two percent of the statewide elk population and is well within the population's ability to maintain or increase size over the long term. Any population reduction from the PLM Program would be short term and would not constitute a significant impact to the gene pool.

The ability of elk populations to experience a given level of hunting mortality without a reduction in health or viability is described by Savidge and Ziesenis (1980) as sustained-yield management. Sustained-yield management is closely related to the compensatory responses in reproduction discussed previously.

Elk hunting in California currently involves herds at separate locations in the State that are at or above herd management objectives. Because the proposed project will not significantly reduce statewide population levels, the Commission concludes that there will not be an adverse impact to the gene pool, either locally or statewide.

### **IMPACTS ON SOCIAL STRUCTURE**

Elk are gregarious and tend to form groups or aggregates. Elk do not mate for life. Males do not invest time or energy in the care of young, but generally form separate bachelor groups. Except for a short breeding period, most adult males generally remain separate from cow-calf groups during the remainder of the year. Therefore, removal of bulls by hunting will have a minimal effect on the social structure of the populations, provided that minimum herd objective bull ratios are maintained. Proposed harvest levels for each herd have been established to maintain or exceed minimum herd

objective bull ratios and to provide for genetic variability, fertilization of cows, and public viewing opportunities of bull elk.

During the nonbreeding period, cow-calf groups generally contain few, if any, adult bulls. However, immature bulls are tolerated in cow-calf groups (Geist 1982). Newborn calves are initially completely dependent upon their dams but quickly adjust to the cow-calf group and form nursery groups within the larger group. Nursery groups briefly fixate and respond to a succession of adult females (Geist 1982). During the first 2.5 months of life, calves nurse extensively (Bubenik 1982). Nursing declines by August for most elk in California, when the proposed project would begin in some areas. There is no indication that calves orphaned at this time have been severely impacted; at Grizzly Island, tule elk calves orphaned in August remained within the social structure of the groups.

Generally, the proposed project has the potential to increase the ratio and number of calves in the hunted elk populations. The increase in calf survival results in a shift of age structure of the elk population from older to prime-age individuals (five to seven years). These prime-age individuals tend to provide higher recruitment rates (calf survival) for the population (Hines et al. 1985). Historical data (Fowler 1985, Botti and Koch 1988, Racine et al. 1988), computer simulation modeling (Smith and Updike 1987), and information from the literature (Taber et al. 1982) indicate that the removal of elk from the population (due to hunting, trapping for reintroduction, or high winter mortality) in one year results in a larger number of calves recruited into the population the following year.

Computer simulation modeling of the populations proposed to be hunted indicates that the removal of elk from these populations by hunting (in addition to nonhunting mortalities) will result in an increased survival of calves born the following spring for most areas (Appendix 3). As an example, in August of 1980 the observed calf ratio for the Bishop subherd was 20 calves per 100 cows. In December of 1980, the Department relocated 75 elk from the Bishop subherd. The following August (1981), the observed calf ratio was 43 calves per 100 cows. This type of increased calf survival (recruitment) is expected and has been observed numerous times in the Owens Valley (Racine et al. 1988) and at Grizzly Island (Botti and Koch 1988).

Most western states establish a goal for a post hunt ratio of at least 20 bulls per 100 cows (the proportion of bulls to cows in the population). Some states have goals as low as six bulls per 100 cows, while other states have goals of 25 bulls per 100 cows in trophy hunt areas (Mohler and Toweill 1982). The Department's management objective for most hunted populations is to maintain at least 25 bulls per 100 cows (the objective ratio for the Northwestern Unit is 15 bulls per 100 cows).

Most tag quotas provide for take of both male and female elk. Achieving and/or maintaining herd objective bull-to-cow ratios is accomplished most readily by harvest of both sexes, because harvesting only male elk can skew the sex ratio towards females;

and, conversely, harvesting only female elk can result in a population skewed towards males (Mohler and Toweill 1982).

Based on the computer simulation analysis of expected harvest rates, the post-hunt bull-to-cow ratios are expected to increase and/or remain above the Department's management objective. Additionally, computer simulation modeling indicates that the proposed take is within sustained-yield management levels. That is, under the proposed harvest levels, the population will be able to maintain itself over the long term at existing or higher population levels.

As discussed earlier, female pregnancy rates and calf survival are inversely related to the density of the elk herd in relationship to the condition of the available habitat. Management that provides for frequent reductions in female and young of the year elk in areas where elk have exceeded their herd size objective encourages age structure dominated by reproductively successful females (Hines et al. 1985).

Based on computer simulation modeling, the proposed project has the potential to increase calf survival rates for the hunted herds, resulting in improved general health of the hunted populations. Also, computer simulation modeling predicts minimal changes in bull-to-cow ratios as a result of the proposed project; such ratios for most hunted herds are predicted to increase or remain near the minimum objective ratio. Bull-to-cow ratios are predicted to remain significantly above corresponding ratios for other western states with hunting programs. Thus, it is unlikely that adverse impacts to the social structure of hunted herds will occur as a result of the proposed project. By increasing calf-to-cow ratios, the proposed project would improve herd condition and could thus have a positive effect on herd social structure.

## **EFFECTS ON HABITAT**

The removal an additional 20 Roosevelt elk through public hunting is not expected to significantly change elk population levels on a long term basis. If no major changes occur in the elk population levels, no major changes in elk-caused effects on habitat (e.g., elk foraging pressure on plants) would be expected. Therefore, the proposed project is not expected to have an impact on habitat in the hunt areas.

The typical technique used to hunt elk within the proposed hunt areas involves spotting animals at a distance and/or quietly approaching them on foot to within a reasonable shooting range. Hunting from a motorized vehicle is illegal. Some hunters may use horses to cover greater distances searching for elk. In any case, the relatively low intensity of hunting effort (because of the low number of elk hunters in the field) within these areas is not expected to produce major effects on habitat. The increase in tags proposed by the Commission is not expected to cause any large increase in activity, or any additional significant impacts.

Both public and private lands occur within the hunt areas. On public lands, the Department provides input to the USFS regarding actions to improve the condition of elk herds and their habitat. Further, the USFS is mandated to incorporate wildlife needs, including elk, into their planning process, as required by the National Forest Management Act. In general, current timber harvest practices on public land benefit elk by creating a diverse mosaic of early successional and mature forest habitat types. Most of the public lands proposed to be open to elk hunting within Del Norte and Humboldt counties are currently open to the public on a year-round basis. These lands also are used for other outdoor recreational activities, such as fishing, photography, hiking, hunting, bird watching and general nature viewing. Due to the large size of the hunt areas (each area is several hundred square miles in size) and existing human use levels of the hunt areas, it is unlikely that the harvest of an additional 20 elk will individually or cumulatively negatively impact the habitat in the hunt areas.

## **EFFECTS ON RECREATIONAL OPPORTUNITIES**

### Hunting Opportunities

The proposed project continues to authorize public hunting of Roosevelt elk providing opportunities to harvest up to 108 elk by hunters who will participate in this unique outdoor experience. The demand for elk hunting opportunities is extremely high in California. In 2018, 39,829 individuals applied for an opportunity to hunt elk in California. In 1988, for the first time, a nonrefundable fee of \$5 was charged to apply for an elk hunt. Despite the new fee, almost 10,000 licensed hunters applied for elk license tags in 1988 with the number growing almost every year to date. The proposed project benefits the hunting public by providing hunting opportunities consistent with the State's Wildlife Conservation Policy and FGC sections 332 and 1801.

The season dates for the Northwestern elk hunts coincide, at least partially, with the B-1 and B-4 deer seasons. However, it is unlikely that deer hunters will be adversely impacted by the low number of elk hunters that may be in the field during the deer season. The Northwestern season dates will also coincide with bear season and the year round wild pig season. Due to the large areas open to hunting and the relatively short elk season, elk hunters will not affect the success or quality of experience for hunters of other species of wildlife.

Some individuals have expressed concern that the hunting regulations of other states might have adverse effects on elk hunting in California (presumably by causing an influx or exodus of hunters.) For the most part, non-resident public elk hunting opportunities on California are very limited (only up to one elk tag per year is available for non-residents to draw; non-residents may purchase one of the three fund-raising elk tags, and are eligible to purchase elk tags through the PLM Program). The Commission does not expect that the hunting regulations of other states will have an adverse effect on elk hunting in California.

## Nonhunting Opportunities

Non-hunting users of the elk resource (viewing, nature study, and photography) will not be significantly impacted by the take of an additional 20 elk from the Northwestern Hunting Zone. Nor will the proposed project impair non-hunters' ability to enjoy the outdoors, the elk resource, or its habitat, due to the availability of opportunities to view elk herds in areas where hunting does not occur, such as within federal or state parks. Three of the State's 22 tule elk herds are maintained in a penned situation where no hunting is contemplated. These herds provide the public an opportunity to enjoy tule elk in their native habitat. Additionally, the proposed action does not provide hunting opportunities at Point Reyes National Seashore, which has a large population of tule elk and is accessible to the public for the enjoyment of elk and other wildlife in the area. General elk hunting seasons vary from four to 23 days. Based on hunter tag returns from 2018, elk hunters only spend, on average, four days hunting elk. This indicates that even for those hunted herds, a majority of time can be spent viewing elk without hunters in the field.

The proposed action will not impact the non-hunting public, because the number of hunters in the field at any one time (established by the quotas for each hunt), in conjunction with the areas open to hunting, will result in very low hunter density. Historically, all areas open for hunting have been open for other types of hunting (waterfowl, upland game birds, rabbit, wild pigs, black bear, etc.) during the same timeframe as the proposed elk hunts. For non-hunters concerned about being in the field during proposed elk hunts, large areas of similar habitats adjacent to or near all hunt areas may be used for non-hunting activities during the short elk hunting period.

## **EFFECTS ON OTHER WILDLIFE SPECIES**

Although some overlap of food habits exists, competition between deer and elk has not been a documented problem in California. Nelson and Leege (1982) stated, "It would appear, therefore, that neither the elk nor the mule deer is affected seriously by the other, mainly because of differences in primary forage species and habitat choice." This also appears to be the case in California. Potential for competition between elk and deer can exist on critical winter ranges shared by the two species. However, there is no scientific evidence to indicate that removal of elk through a hunting program will adversely impact the local or statewide deer resource.

During the last few years, the potential for competition between deer and elk has received greater attention in the western states and provinces of North America. Many states and provinces have reported a decline in deer population numbers, coinciding with an increase in elk numbers. It has not been proven that elk displace deer or are a significant factor in suppressing their numbers throughout a broad geographic region. In considering the potential for competitive interaction between deer and elk, a variety of factors may be important, such as predation, climate, digestive physiology, energetics, vegetation succession, livestock, and human-related factors. Lindzey et al. (1997)

discussed these and other factors in reviewing the potential for competition between deer and elk throughout the west, and compiled an extensive list of references regarding this subject. They concluded it is appropriate to question whether the growth of elk populations has contributed to apparent deer decline, but found no consistent trends in geographic areas used sympatrically to suggest a cause-and effect relationship.

Due to their large body size, adult elk experience limited predation. Cases of lion predation on adult elk have been documented (Taber et al. 1982, Booth et al. 1988, Racine et al. 1988). Results of fall surveys have documented several confirmed lion-killed elk since 1988. However, there is no scientific evidence to indicate mountain lion predation significantly affects elk statewide in California as demonstrated by increases in elk numbers.

Coyotes, black bears, wolves, and mountain lions prey on elk and/or elk calves. It is possible, as a result of removing adult elk from elk herds, calf production will increase the following spring. This could provide additional prey for predators. Historical herd performance data collected on elk herds indicate that calf recruitment will increase after an elk removal, regardless of the existence of predators in the area (Racine et al. 1988). Based on a review of available information discussed in this document, it is reasonable to assume the proposed project will not have measurable short-term or long-term effects on other local wildlife populations, including deer, mountain lions, black bears, wolves, and coyotes.

A number of endangered, threatened or locally unique animals and plants may occur within the elk hunt areas. The Department is charged with the responsibility to determine if any hunting regulations will impact threatened or endangered species. It complies with this mandate by consulting internally and with the Commission when establishing elk hunting regulations to ensure that the implementation of the proposed project and existing hunting regulations do not affect these species. It is unlikely that adverse impacts to rare, endangered, threatened, or locally unique species associated with the proposed hunt areas will occur as a result of the proposed project. Most rare, endangered, threatened, or locally unique species associated with the hunt areas either are associated with habitats where elk hunting is not likely to occur or use these areas during a time (season) different from when the proposed project will occur. The proposed project will involve a minimal number of hunters using areas, that for the most part, are open to the public for a variety of uses, including hunting. The Department has concluded that, based on conditions of the proposed project and existing hunting regulations, differences in size, coloration, distribution, and habitat use between the listed species and elk, the proposed project will not jeopardize these species.

## **EFFECTS ON ECONOMICS**

The proposed project will not result in changes to the environment, either directly or indirectly, which would produce significant negative environmental effects. Therefore,

no CEQA review of economic effects is necessary. However, the proposed project has the potential to result in minor economic effects on the communities where elk hunting is proposed.

The effects of the Elk hunting regulations on the local economy may involve increases in economic activity near the hunt areas, as visiting hunters purchase goods and services from local merchants. This additional spending would generate additional retail sales, business spending, and income that could in turn, contribute to employment in motels, restaurants, and retail stores.

## **EFFECTS ON PUBLIC SAFETY**

Since 1989, the Department has received no reports of elk hunting-related casualties in California. This does not diminish the fact that people have died or been wounded while hunting other big game animals. Based on the total number of licensed hunters in California and the annual number of accidents, there is roughly a 0.00425-0.005 percent chance of being killed or wounded while hunting deer. Additionally, Department records show that no non-hunting injuries or deaths have occurred as a result of elk hunting. As with any outdoor activity, there is always a risk of injury or death. However, the probability of being injured while hunting elk is extremely low, especially in comparison to other recreational activities. This good safety record is due, in part, to the requirement that all hunters must successfully pass a hunter safety education course prior to receiving a hunting license. It is unlikely that the proposed project will result in adverse impacts to public safety.

## **GROWTH-INDUCING IMPACTS**

There are no growth-inducing impacts associated with the proposed project. As discussed in "Effects on Economics" in this chapter, minor increases in retail sales, income, and possibly employment are anticipated in the regions where the proposed hunt areas exist. However, the small number of public tags available is unlikely to create growth-inducing impacts in a State with a total human population of over 30 million.

## **SHORT-TERM USES AND LONG-TERM PRODUCTIVITY**

The proposed project will not affect a variety of short-term uses currently available to the public. Additionally, the proposed project will provide for public hunting opportunity without adversely affecting long-term productivity of statewide or local elk populations, based on predictions of simulation modeling.

## **SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES**

No significant irreversible environmental changes are expected to occur as a result of the proposed project. The proposed harvest levels were selected to avoid adversely

impacting hunted populations and to reach or maintain herd management objectives. The proposed project is designed to avoid significant adverse impacts to other wildlife species, their habitat, and listed or locally unique species. As discussed previously, adverse impacts to economics and public uses (including safety) are not expected.

## **WELFARE OF THE INDIVIDUAL ANIMAL**

Analysis of welfare of the individual animal was presented on page 120 (incorporated by reference, April, 2006 Final Environmental Document, SCH#2003112075, available at 1812 9<sup>th</sup> Street, Sacramento, CA 95811). The project has been designed to limit wounding through the specification of minimum performance requirements for archery equipment and firearms. It is expected that some wounding may nevertheless occur. The methods of take are not one hundred percent lethal. Lethality is largely a function of hunter skill and accuracy. The Department has evaluated the welfare of the individual animal and has specified minimum performance requirements for archery equipment and firearms in existing regulations.

## **CUMULATIVE IMPACTS**

The proposed project provides for a specific level of public elk hunting in specified areas during 2019, and it is reasonably foreseeable that the Commission would consider and approve hunts in these areas in the future. Because of this potential, the Department modeled population performance of hunted herds for a 10-year period. Potential effects of cumulative factors identified in this section were considered with the model runs. It must be emphasized that the model runs specify the same level of harvest (expressed as a percentage of the population) each year. The statutorily mandated regulation process involves review and appropriate regulation changes based on the condition of a population. Data collected by the Department during the year following the approval or denial of the proposed project would be examined, and appropriate, biologically sound recommendations would be presented by the Department to the Commission prior to approval of any future hunt.

Section 255, FGC, identifies the steps required for the Commission to adopt, amend or repeal regulations relating to mammal hunting. This law requires that the Commission receive recommendations regarding mammal hunting regulations from Commission members, its staff, the Department, other public agencies, and the public. The process is analogous to the Commission establishing specific harvest quotas for the deer and pronghorn antelope hunting seasons. The system has worked well over time in adjusting the hunting program to maintain healthy wildlife populations.

## Effects of Private Lands Wildlife Habitat Enhancement and Management (PLM) Area Program

To become licensed in the PLM Program, landowners are required to submit an application package which includes a management plan. This plan must contain, among other things, habitat enhancement goals and objectives to be accomplished over the term of the five-year license. The habitat projects outlined in the plan are directed toward improving habitat for both game and nongame species. The ultimate goal of these habitat improvement practices is to enhance or stabilize (under adverse ecological conditions) populations of various wildlife species present on the area. Once licensed, the PLM is reviewed annually by the Commission to ensure compliance with all regulations and administrative procedures.

The PLM Program has been successful as an incentive for landowners to protect and improve wildlife habitat. Habitat improvements implemented under approved management plans on licensed areas include conducting controlled burns to improve forage conditions, reducing livestock grazing to reduce competition with wildlife, protecting wildlife fawning/nesting sites and riparian areas, developing wetland/marsh areas, constructing brush piles, improving water sources, and planting forage and cover crops for wildlife. The projects directly benefit deer, elk, bear, antelope, wild pigs, waterfowl, turkeys, quail, and a wide variety of nongame wildlife, including threatened and endangered species. Habitat improvements accomplished specifically for game species (such as riparian improvement, protection, and enhancement) directly benefit hundreds (approximately 331 species in hardwood-dominated habitats) of nongame wildlife species.

The anticipated PLM harvest was modeled as part of the overall (public and PLM) harvest simulation model run (Appendix 3). As discussed previously, no adverse impacts are expected, based on the simulation model runs. The simulation models (Appendix 3) indicate previous harvest levels have been below the maximum sustainable yield. Because the expected harvest under the PLM Program is less than the maximum sustainable yield (harvest), the Department has determined that the PLM Program, together with the proposed project, will not have a significant adverse cumulative effect on elk populations in California.

Nine licensees participated in the PLM Program for elk in the Northwestern elk zone in 2018 (Appendix 6). The Department recommends issuing no more than 40 elk tags through these nine PLM properties for 2019. Previous total elk harvests under the PLM program have been below these levels (35 elk were harvested in 2018 under the PLM program in the Northwestern elk zone). Expected harvest under the PLM program is anticipated to be below the maximum PLM quota. Thus, harvest under the PLM program, either alone, or combined with the proposed public harvest, will not have a significant adverse cumulative effect on statewide or local populations of elk.

## Effects of Drought

Drought cycles are part of the ecological system in California and elk are adapted to low water years. Still, multi-year droughts can reduce elk populations on a local scale. Drought conditions can impact elk in a variety of ways including: degraded habitat quality (less vegetation growth) and reduced food production (both natural and agricultural). California has a "Mediterranean climate," meaning that over the long-term, the State receives the bulk of its precipitation during the cool fall and winter months, while warm spring and summer months are generally dry. In other words, California undergoes a "summer drought" each year. However, extreme variation in precipitation occurs in the State on an annual basis. For example, the northwest coast receives a great deal of precipitation, while southern deserts receive very little precipitation. Additionally, topographic features, such as the Sierra Nevada, influence climate by creating a rain shadow, whereby most of the precipitation falls on the west side of the range, extracting most of the moisture from clouds by the time they reach the east side of the range. The amount of precipitation in California is extremely variable on a geographic basis within a year and extremely variable in any one area among years.

Throughout much of the State, stream courses, natural lakes, ponds, springs, and reservoirs were affected by the recent drought. As far as terrestrial wildlife are concerned, prolonged drought in areas with scarce water, such as in the desert and south coast ranges, may affect production and survival of young for a variety of species in future years. Droughts are cyclic long-term, and all wildlife species and their habitats in California have evolved under conditions of periodic drought (Bakker 1972, Munz and Keck 1973, Oruduff 1974, Burcham 1975, Barbour and Major 1977). Since the 1800s, California has experienced several drought cycles lasting two to five consecutive years (Department of Water Resources 2015). Because of this natural variation in water availability, vegetation communities have evolved and adapted with associated changes in soil moisture (Barbour and Major 1977). Many of California's plant communities (e.g., desert, chaparral, grassland, oak-woodland, etc.) are drought tolerant. However, drought can affect plant species. Growth and vigor of forage plants may be severely reduced during drought, due to reduced germination of annual plants, and reduced growth of shrubs and trees adapted to conserve water. Consequently, the quantity and quality of forage for herbivores is reduced during periods of drought.

While drought effects on vegetation communities can be unpredictable, some studies have been conducted. One study measured acorn production (a primary food of many wildlife species) in five oak species occurring at a site in Monterey County from 1980-89 (Koenig et al. 1991). That study determined that acorn production was highly variable among oak species from year-to-year and that climatic variables generally did not correlate with annual variation in acorn production. The study also indicated that local acorn crop failures may have detrimental effects on local populations. However, total crop failures on a community-wide basis among all species are rare, even during drought years. Similarly, acorn production data from a four-year period in Tehama County (Barrett, unpublished data) indicate that annual production was approximately

60 percent, 20 percent, five percent, and 180 percent, respectively, of the mean annual crop between 1987 and 1990.

Alternatively, in vegetation communities comprised of annual plants, lack of fall germinating rains, or minimal spring rains can preclude germination of forbs and grasses, which are important sources of forage, primarily during the fall, winter, and spring. The seeds lie dormant in the soil until germinating conditions are suitable. Drought may also weaken resistance of plants to disease, fungus, and insect damage, cyclically affecting vegetation.

Hence, during drought, some plant species respond in ways that benefit wildlife (e.g., increased acorn production), while others respond in ways detrimental to wildlife (e.g., reduced grass and forb growth).

Native game mammals in California have evolved to withstand both drought and flood extremes within their ranges. Before human intervention, these ranges likely varied in response to periods of prolonged drought or wet conditions. Currently, however, remaining habitats are, to a large extent, managed and affected by humans. Water management has likely resulted in greater stability in modern wildlife populations in many cases due, in part, to the advent of water wells, sites developed to enhance water for wildlife (e.g., guzzlers), irrigation, and reservoirs. In many areas, water is more available to wildlife, regardless of drought, than it would have been prior to large-scale human development in California.

The reduced quantity of vegetative cover due to prolonged drought in some areas could affect thermal and hiding cover important to wildlife. However, such effects are not yet reflected in population data.

Significant impacts to wildlife due to drought in some areas of the State may occur if drought conditions persist for more than several years. Potential impacts include reduced habitat quality and quantity, resulting in reduced reproductive success and survival of individuals in a population. As a result, periodic drought conditions may produce short-term effects due to less available forage, but may have little, if any, long-term effects on the abundance of most species.

Effects of drought on wildlife species would be reflected in poorer physical condition of individual animals, decreased survival of individuals, declining reproduction and survival of young, and reduced population size. While fluctuations may occur annually in some areas, the large-scale effects of significant drought events could be felt statewide.

Effects of drought conditions on elk populations have been recorded in the Owens Valley and in the Cache Creek area (Fowler 1985, Booth et al. 1988, Racine et al. 1988). While drought may result in increased mortality among individuals in an elk population (primarily reduced calf survival), the proposed project is based on data collected on populations with exposure to periodic drought conditions and will not affect

viability of local populations. Records of drought prior to 1988 indicate the Grizzly Island tule elk herd was not affected (Botti and Koch 1988). Based on the above information the possibility of drought impairing the statewide tule elk population is very unlikely.

The Department's evaluation of conditions and trends of elk herds and habitats is an ongoing facet of the Department's elk management program (CDFW 2018). Information collected by the Department and other sources will inform future recommendations for elk hunting programs and other management activities, such as habitat improvement or acquisition projects. The impacts, if any, of a catastrophic event on elk populations would be addressed in carrying out any future management actions. In addition, the Commission has the regulatory authority (Section 314, FGC) to take emergency action to cancel or suspend one or more proposed elk hunts if a catastrophic event occurred which, in conjunction with a hunting program, could significantly impact the elk population. Thus, the Commission does not anticipate adverse impacts will occur as a result of drought in combination with the proposed project.

### Effects of Wildfire

One aspect of prolonged drought that would affect wildlife habitat is an increased risk of wildfire due to extremely dry conditions. However, wildfire can be a problem in extremely wet years due to increased fuel loads. Consequently, it can be difficult to conclude that drought years predispose some vegetation communities to wildfire more than wet years. In forested communities, woody plant communities affected by prolonged drought may experience increased plant mortality and decreased moisture content, increasing their susceptibility to wildfire.

Catastrophic events, such as wildfire and drought, have affected elk throughout their evolution. Although effects of drought and wildfire can have an impact on local populations of elk, historical data collected by the Department (McCullough 1969, Fowler 1985, Racine et al. 1988) indicate that there is no evidence that drought, wildfires, or other catastrophic events have resulted in the extirpation of an elk population.

Wildfires are a natural occurrence in elk range. Plant species in the hunt areas have evolved with fire, and many species of plants require fire to complete their life cycle. Fire is not known to have negative long-term effects on elk populations, and considerable information indicates fire can significantly improve elk habitat (Lyon and Ward 1982). Within the Northwestern Hunt Zone, the climate is heavily marine influenced and moist, minimizing risk of wildfire which is not expected to be prevalent.

Wildfires have the potential to positively impact elk populations. Initially, fire may displace elk for a short time period (two to three months). However, elk often return to burned areas immediately following fire. Longer-term impacts may have significant

positive effects on local populations. For example, a wildfire may burn habitat used by elk, causing short-term loss of some forage and cover. However, elk move back into the burned areas quickly to utilize the young nutritious forage growing in the burned areas (T. Burton, Department of Fish and Wildlife, Yreka, personal communication). Also, since elk are primarily grazing animals, eating mostly grasses, fires that burn brush and trees open areas to allow more grasses to grow, and thus benefit elk (Lyon and Ward 1982).

Based on the above information, the possibility of wildfires impairing the statewide Roosevelt, Rocky Mountain, or tule elk populations from persisting in a healthy, viable condition is very unlikely. Evaluation of elk herd and habitat conditions and trends is an ongoing element of the Department's elk management program. Information collected by the Department and other sources will be used to modify any future recommendations for hunting programs and to recommend other management activities, such as habitat improvement or acquisition projects. The impacts, if any, of a catastrophic event on elk populations would be addressed in carrying out any future management actions. In addition, the Commission has the regulatory authority (Section 314, FGC) to take emergency action to cancel or suspend elk hunting if a catastrophic event occurs which, in conjunction with a hunting program, could significantly impact the elk population. Thus, the Commission does not anticipate adverse impacts will occur as a result of wildfire in combination with the proposed project.

### Effects of Disease

Historical data indicate elk are remarkably free of disease (Fowler 1985, Booth et al. 1988, Botti and Koch 1988, and Racine et al. 1988). However, Roosevelt elk tested in the Prairie Creek area of Humboldt County showed signs of heavy parasite levels and poor body condition in 1960 and 1982 (Department of Fish and Game files). The Department routinely collects blood samples from the majority of elk captured. Over the last 20 years, the Department has analyzed approximately 900 tule elk and 200 Roosevelt elk blood samples to systematically determine the prevalence of disease and assess the general health of the State's elk.

Recent concern has grown about effects of Chronic Wasting Disease (CWD) on deer and elk in North America (Williams et al., 2002). CWD is a fatal, contagious transmissible spongiform encephalopathy infecting the brains of deer and elk. It has been diagnosed within numerous states and provinces of North America. The Department began a surveillance program in 1999 and has tested more than 900 samples from California deer for CWD. All results to date have been negative. California is considered a low risk state for CWD; game ranching of cervids is not allowed (except for fallow deer), and importing live cervids is severely restricted. CWD is not currently known to be naturally transmitted to humans or animals other than deer and elk. On August 30, 2002, the Fish and Game Commission adopted emergency regulations placing conditions on the importation of hunter-harvested deer and elk into California. Those restrictions, which prohibit the importation and/or possession of brain

matter or spinal cord of a deer, elk or cervid from another state, were made permanent. The Department has established a task force to expand its disease monitoring efforts and improved surveillance for CWD (and other diseases) to improve preparedness should CWD emerge in California.

There is no indication of a potential for the State's elk populations (either statewide or locally) to be significantly impacted by a major disease outbreak. There are no data available to indicate that disease, road kills, predation or other natural mortality factors will act as additive impacts which, along with the proposed hunting program, will have a significant adverse cumulative impact on local or statewide elk populations.

### Effects of Habitat Loss and Degradation

The proposed project is not likely to cause habitat loss and degradation. The removal of individuals may actually improve elk habitat by decreasing grazing intensity. The elk hunting season is short, and most of the hunting areas are generally open to the public for other uses year-round. The effects on habitat loss and degradation by hunters during the elk hunting season would be negligible.

On private land, there are potential changes in land ownership which may result in land-use changes. No major changes in private land-use patterns are expected in the near future. The long-term outlook for elk habitat on public lands in California is stable to improving. The cumulative impacts of habitat modification plus hunting are not expected to have a significant adverse impact on elk populations. In combination with the proposed project, potential habitat modification/ degradation is unlikely to have significant adverse cumulative effects.

### Effects of Illegal Harvest

Illegal harvest of game mammals is difficult to quantify. It is likely that elk have been taken illegally from proposed hunt areas, as well as from other herds where hunting is not proposed. Department records indicate at least three citations per year involving illegal take/possession of elk were issued in 1997 and 1998. At least three citations involving elk were issued each year in 2000 and 2001. Illegal harvest of subspecies other than Roosevelt elk has occurred in California and other western states (Potter 1982).

Illegal take of tule elk has occurred in the Owens Valley, at Grizzly Island and Fort Hunter Liggett during recent tule elk seasons. One hunter at Grizzly Island was cited for taking two and one cited for taking a spike elk while possessing an antlerless tag. Similar incidents occurred sporadically in the past. Such incidents of unintentional illegal take have occurred with other game animals in California and other western states. The Department conducts mandatory hunter orientations for some tule elk hunt sin California and emphasizes avoiding incidents of unintentional illegal take and distributes informational material to all elk tag holders. The Department will continue

this emphasis in future orientations; additionally, the Department will continue to issue citations to individuals for illegally taking elk, regardless of whether or not such take is intentional. Even with such measures, however, some level of unintentional illegal take is expected to continue. Nevertheless, there is no indication that illegal harvest will, in combination with the proposed project, have significant adverse cumulative effects.

### Effects of Depredation

Private property conflicts involving effects of elk on agricultural crops, fences, and other personal property have occurred, and are likely to continue wherever elk and humans coexist. Section 4181, FGC, provides for the killing of elk when private "property is being damaged or is in danger of being damaged or destroyed." However, current Department policy is to attempt all reasonable and practical means of nonlethal control prior to issuing a depredation permit for elk.

Issuing depredation (kill) permits is considered as the final measure to alleviate localized private property conflicts involving elk; and the Department issued no elk depredation permits from 1989 until 2002. However, as elk populations have increased and distribution has expanded, conflicts on private property have increased in severity. Since 2002, the Department has issued approximately 19 elk depredation permits.

With the establishment of the SHARE Program, the Department offers recreational hunting opportunities in partnership with landowners to help alleviate effects of elk on private lands. This program provides incentives to allow public access on private lands. The resulting hunting pressure helps alleviate some of the conflict and provides important recreational opportunities, which function as a tool for elk management.

In response to the increasing private property conflicts involving elk, the State Legislature passed Assembly Bill 1420 (AB1420, Laird; Chaptered September 4, 2003). Among other things, AB 1420 directs the Department to prepare a statewide elk management plan that identifies management activities necessary to alleviate private property damage caused by elk. The statewide Elk Conservation and Management Plan was completed and released in December 2018 (CDFW 2018). Prior to issuing an elk depredation permit, AB1420 requires the Department to verify damage caused by elk, provide a written summary of corrective measures to alleviate the problem, determine the viability of the subject elk herd and the minimum population numbers needed to sustain it, and finally to ensure that a permit will not reduce the herd below the minimum population level.

To alleviate private property conflicts involving elk, the Department will investigate the potential for expanding hunting opportunities. Because of the constraints in AB1420, the Commission does not anticipate adverse cumulative impacts to elk populations resulting from combined effects of the proposed project and issuance of depredation permits.

## Effects of Vehicle-Caused Mortality

The number of elk killed by vehicles is not well documented. Unlike deer, very few elk in California appear to be killed by automobiles each year. Vehicle-caused elk mortalities have been reported (specifically with Roosevelt elk in Del Norte and Humboldt counties and tule elk in the Owens Valley and at Cache Creek) since 1990. Unreported incidents cannot be quantified. However, the Commission believes effects of vehicle-caused mortality on statewide and localized elk populations are minimal.

## Conclusion

The Department has examined a variety of factors that might affect Roosevelt elk populations in the Northwestern elk zone. The Department does not anticipate adverse cumulative impacts to the local elk populations will occur as a result of the proposed project in combination with any factor discussed. However, if some unforeseen cataclysmic event should occur that threatens the welfare of either statewide elk populations or individual hunted populations, the Commission has the authority to take appropriate action, which may include emergency closure of seasons and/or reduction of future hunting opportunities.

Although hunting elk will result in the death of individual elk, limited tag quotas, short seasons, bag limits, and close monitoring of hunter activity in the field, will result in removing elk at a level below the individual herds' sustained-yield capabilities. The elk herds proposed for hunting will be maintained within specified management plan objective ranges. Statewide population levels for Roosevelt elk will remain stable. Therefore, significant adverse effects, individually or cumulatively, to elk populations are not expected to result from the proposed project. Additionally, no impacts from two or more separate factors have been identified where, when viewed alone would be minor, but whose combined effect would be significant. Because individual and cumulative negative impacts are not expected to occur, specific mitigation measures are unnecessary.

## CHAPTER 3 - ALTERNATIVES

### **ALTERNATIVE 1 - NO PROJECT (NO CHANGE- MAINTAIN CURRENT CONDITION)**

Other than annual tag quota modifications proposed in response to herd productivity, implementation of the No Project Alternative would result in no change from the 2010 tag quota range for Northwestern California. The Department does not expect age and sex ratios to change appreciably under this alternative. Herd size is expected to remain stable, or increase if currently below carrying capacity (Appendix 3). Since this alternative presents no changes to current levels of hunting activity and elk harvest, the no-project alternative would not lead to any potential significant impacts on the environment.

### **ALTERNATIVE 2 – INCREASED HARVEST**

Alternative 2 represents management options that will achieve an increased harvest (IH) for Northwestern California by increasing the available tags to 60 instead of 20 in the proposed alternative. IH refers to a harvest strategy that maximizes the number of animals that can be harvested from a population, commensurate with the goals and objectives stated for that herd, for at least the following year. A potential issue with an IH management strategy is risk of overharvest. If overharvest occurs under an IH program, more conservative management strategies would be necessary the following year to address it. Based on the Department's current understanding of elk populations in the Northwestern Hunt Zone and the scenarios run in Elk Pop, an IH scenario may affect the ability to meet the statewide objective to increase populations by ten percent. While calf ratios are expected to increase in response to increased harvest under an IH program, herd growth in Northwestern California may be limited if an IH program is maintained for a ten-year period (Appendix 3). While impacts to the environment and the sustainability of California's elk population are not anticipated to be significant with this level of harvest, it may not achieve the Department's management objective of increasing the population by ten percent in suitable areas where depredation conflicts are minimal. Although the Northwestern Hunt Zone has experienced a significant increase in landowner conflicts, the Department does not recommend an IH strategy at this time but recognizes the importance and need for continued evaluation.

### **ALTERNATIVE 3 – REDUCED HARVEST**

Alternative 3 represents management options for Northwestern California that will produce a relatively small increase in harvest by adding ten additional tags rather than 20. This reduced harvest (RH) is a strategy that provides hunting opportunities at reduced levels from those proposed under either IH or the proposed project. Calf ratios may increase slightly, whereas bull ratios are not expected to change appreciably under this alternative. Herd size is expected to remain stable, or increase if currently below carrying capacity (Appendix 3). Since this alternative would reduce hunting opportunity, it does not achieve the Department's management objective of providing for diversified recreational opportunities for enjoyment of wildlife, within sustainable levels.

There are no significant long-term adverse impacts associated with the proposed project or any of the three alternatives described above. However, the Department recommends the proposed project because it is most compatible with objectives of population growth (Objective 1.2), increasing hunting opportunities (Objective 3.1), and reducing human-elk conflicts on private property (Objective 4.1) in the Department's Elk Conservation and Management plan (CDFW 2018). Alternative 1 would not increase hunting opportunities or help alleviate conflicts on private property. Alternative 2 (IH) may be warranted, and additional research efforts to improve understanding of elk distribution and population dynamics are necessary to consider that level of increase. The Department recognizes continued elk population growth and increasing human-elk conflicts as it works in partnership with other agencies, non-profits and landowners to develop long-term solutions consistent with management plan objectives. Whereas Alternative 3 (RH) may also achieve these objectives, it does not optimize public hunting opportunities or alleviation of conflicts on private property.

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## Appendix 1. CEQA Environmental Checklist Form

### CEQA Appendix G: Environmental Checklist form

NOTE: The following is a sample form and may be tailored to satisfy individual agencies' needs and project circumstances. It may be used to meet the requirements for an initial study when the criteria set forth in CEQA Guidelines have been met. Substantial evidence of potential impacts that are not listed on this form must also be considered. The sample questions in this form are intended to encourage thoughtful assessment of impacts, and do not necessarily represent thresholds of significance.

1. Project title: Elk Hunting
2. Lead agency name and address:  
California Fish and Game Commission  
1416 9<sup>th</sup> Street, Suite 1320  
Sacramento, CA 95814
3. Contact person and phone number: Kari Lewis, Chief, Wildlife Branch - (916) 445-3789
4. Project location: Statewide
5. Project sponsor's name and address:  
California Department of Fish and Wildlife  
Wildlife Branch, 1812 9<sup>th</sup> Street  
Sacramento, CA 95811
6. General plan designation: N/A
7. Zoning: N/A
8. Description of project: (Describe the whole action involved, including but not limited to later phases of the project, and any secondary, support, or off-site features necessary for its implementation. Attach additional sheets if necessary.) The proposed project would increase the tag quota range (by 20 tags) in the Northwestern Elk Zone.
9. Surrounding land uses and setting: Briefly describe the project's surroundings:  
The project occurs in areas in Del Norte and Humboldt Counties open to elk hunting.
10. Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement.)  
N/A
11. Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code section 21080.3.1? If so, has consultation begun?  
No.

NOTE: Conducting consultation early in the CEQA process allows tribal governments, lead agencies, and project proponents to discuss the level of environmental review, identify and address potential adverse impacts to tribal cultural resources, and reduce the potential for delay and conflict in the environmental review process. (See Public Resources Code section 21083.3.2.) Information may also be available from the California Native American Heritage Commission's Sacred Lands File per Public Resources Code section 5097.96 and the California Historical Resources Information System administered by the California Office of Historic Preservation. Please also note that Public Resources Code section 21082.3(c) contains provisions specific to confidentiality.

**ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:**

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

- |   |   |  |
|---|---|--|
| <input type="checkbox"/> Aesthetics                         | <input type="checkbox"/> Agriculture and Forestry Resources | <input type="checkbox"/> Air Quality               |
| <input checked="" type="checkbox"/> Biological Resources    | <input type="checkbox"/> Cultural Resources                 | <input type="checkbox"/> Geology /Soils            |
| <input type="checkbox"/> Greenhouse Gas Emissions           | <input type="checkbox"/> Hazards & Hazardous Materials      | <input type="checkbox"/> Hydrology / Water Quality |
| <input type="checkbox"/> Land Use / Planning                | <input type="checkbox"/> Mineral Resources                  | <input type="checkbox"/> Noise                     |
| <input type="checkbox"/> Population / Housing               | <input type="checkbox"/> Public Services                    | <input checked="" type="checkbox"/> Recreation     |
| <input type="checkbox"/> Transportation/Traffic             | <input type="checkbox"/> Tribal Cultural Resources          | <input type="checkbox"/> Utilities/Service Systems |
| <input type="checkbox"/> Mandatory Findings of Significance |   |  |

DETERMINATION: (To be completed by the Lead Agency)

On the basis of this initial evaluation:

- I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT equivalent under the Commission's Certified Regulatory Plan is required.
- I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An SUPPLEMENTAL ENVIRONMENTAL IMPACT REPORT equivalent under the Commission's Certified Regulatory Plan is required, but it must analyze only the effects that remain to be addressed.
- I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Signature 

Date 2/19/19

## EVALUATION OF ENVIRONMENTAL IMPACTS:

- 1) A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).
- 2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.
- 3) Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.
- 4) "Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from "Earlier Analyses," as described in (5) below, may be cross-referenced).
- 5) Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:
  - a) Earlier Analysis Used. Identify and state where they are available for review.
  - b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.
  - c) Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.
- 6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.
- 7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.
- 8) This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.
- 9) The explanation of each issue should identify:
  - a) the significance criteria or threshold, if any, used to evaluate each question; and
  - b) the mitigation measure identified, if any, to reduce the impact to less than significance

Issues:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<b>I. AESTHETICS.</b> Would the project:				
a) Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>II. AGRICULTURE AND FORESTRY RESOURCES.</b> In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the <u>California Agricultural Land Evaluation and Site Assessment Model (1997)</u> prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the <u>Forest and Range Assessment Project</u> and the <u>Forest Legacy Assessment project</u> ; and forest carbon measurement methodology provided in <u>Forest Protocols</u> adopted by the California Air Resources Board. Would the project:				
a) <u>Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) <u>Conflict with existing zoning for agricultural use, or a Williamson Act contract?</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) <u>Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>III. AIR QUALITY.</b> Where available, the significance criteria established by the applicable <u>air quality management or</u>				

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<u>air pollution control district</u> may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b><u>IV. BIOLOGICAL RESOURCES:</u></b>				
Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the <u>California Department of Fish and Game</u> or <u>U.S. Fish and Wildlife Service</u> ?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the <u>California Department of Fish and Game</u> or <u>US Fish and Wildlife Service</u> ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Have a substantial adverse effect on federally protected wetlands as defined by <u>Section 404 of the Clean Water Act</u> (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Conflict with the provisions of an adopted <u>Habitat Conservation Plan</u> , <u>Natural Community Conservation Plan</u> , or other approved local, regional, or state habitat conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
<u>VI. GEOLOGY AND SOILS.</u> Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to <u>Division of Mines and Geology Special Publication 42.</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Be located on <u>expansive soil</u> , as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<u>VII. GREENHOUSE GAS EMISSIONS.</u> Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with an applicable plan, policy or <u>regulation</u> adopted for the purpose of reducing the emissions of greenhouse gases?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<u>VIII. HAZARDS AND HAZARDOUS MATERIALS.</u> Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
IX. HYDROLOGY AND WATER QUALITY. Would the project:				
a) Violate any <u>water quality standards or waste discharge requirements</u> ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Substantially deplete <u>groundwater</u> supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
f) Otherwise substantially degrade water quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Place housing within a 100-year flood hazard area as mapped on a <u>federal Flood Hazard Boundary</u> or <u>Flood Insurance Rate Map</u> or other flood hazard delineation map?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
j) Inundation by seiche, tsunami, or mudflow?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>X. LAND USE AND PLANNING.</b> Would the project:				
a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>XI. MINERAL RESOURCES.</b> Would the project:				
a) Result in the loss of availability of a known <u>mineral resource</u> that would be of value to the region and the residents of the state?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>XII. NOISE</b> -- Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
project expose people residing or working in the project area to excessive noise levels?				
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>XIII. POPULATION AND HOUSING.</b> Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>XIV. PUBLIC SERVICES.</b>				
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>XV. RECREATION.</b>				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>XVI. TRANSPORTATION/TRAFFIC.</b>				
Would the project:				

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**XVII. TRIBAL CULTURAL RESOURCES**

a ) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**VIII. UTILITIES AND SERVICE SYSTEMS.**

Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Exceed wastewater treatment requirements of the applicable <u>Regional Water Quality Control Board</u> ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Comply with <u>federal</u> , <u>state</u> , and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**XIX. MANDATORY FINDINGS OF SIGNIFICANCE**

a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	<b>Potentially Significant Impact</b>	<b>Less Than Significant with Mitigation Incorporated</b>	<b>Less Than Significant Impact</b>	<b>No Impact</b>
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Note: Authority cited: Sections 21083 and 21083.05, 21083.09 Public Resources Code. Reference: Section 65088.4, Gov. Code; Sections 21073, 21074 21080(c), 21080.1, 21080.3, 21083, 21083.05, 21083.3, 21080.3.1, 21080.3.2,21082.3, 21084.2, 21084.3, 21093, 21094, 21095, and 21151, Public Resources Code; Sundstrom v. County of Mendocino, (1988) 202 Cal.App.3d 296; Leonoff v. Monterey Board of Supervisors, (1990) 222 Cal.App.3d 1337; Eureka Citizens for Responsible Govt. v. City of Eureka (2007) 147 Cal.App.4th 357; Protect the Historic Amador Waterways v. Amador Water Agency (2004) 116 Cal.App.4th at 1109; San Franciscans Upholding the Downtown Plan v. City and County of San Francisco (2002) 102 Cal.App.4th 656.

**Appendix 2** - 2019 Proposed Elk Tag Allocation for the Northwest Zone. Tags will be distributed between general draws and SHARE hunts.

	<b>2018 Tag Allocation</b>	<b>2018 Tag Range</b>	<b>2019 Tag Range (Proposed)</b>
<b>Bull</b>	20	0-20	0-28
<b>Antlerless</b>	22	0-22	0-34
<b>Either-sex</b>	3	0-3	0-3

### Appendix 3. Computer Model Runs (Elk Pop) Harvest

NORTHWESTERN CALIF. ELK HERD SIMULATION- GENERAL, PLM, SHARE TAGS, 2019  
 (Combined Harvest for Del Norte and Humboldt cos)

Ratio = 37/100/32 - Maximum Calf Survival = 40%

THIS PROGRAM CALCULATES CHANGES IN HERD  
 CHARACTERISTICS BASED ON VARIOUS HARVEST  
 RATES.

CURRENT CONDITIONS = NO CHANGE. GENERAL, COOP ELK, SHARE AND PLM TAGS TO  
 HARVEST APPROXIMATELY 44 BULLS AND 21 ANTLERLESS ELK

	HERD SIZE	1600	ELK
% BULLS LOST TO NON HUNTING CAUSES		23.5	%
% COWS LOST TO NON HUNTING CAUSES		11.9	%
% OF BULLS KILLED BY HUNTERS		12.55	%
% OF COWS KILLED BY HUNTERS		2.2	%

		BULLS	COWS	SURV. CALVES	TOTAL	K	BULLS HARVEST	COWS HARVEST
START	AUG	350	947	303	1600	1600	44	21
YEAR 1	"	350	949	301	1600	1600	44	21
YEAR 2	"	349	950	300	1600	1600	44	21
YEAR 3	"	349	951	300	1600	1600	44	21
YEAR 4	"	348	952	300	1600	1600	44	21
YEAR 5	"	348	952	300	1600	1600	44	21
YEAR 6	"	347	953	300	1600	1600	44	21
YEAR 7	"	347	953	300	1600	1600	44	21
YEAR 8	"	347	953	300	1600	1600	44	21
YEAR 9	"	347	953	300	1600	1600	44	21
YEAR 10	"	347	954	300	1600	1600	44	21

		BULL RATIO	CALF RATIO
START		37	32
POST HUNT YR	1	33	32
POST HUNT YR	2	33	32
POST HUNT YR	3	33	32
POST HUNT YR	4	33	32
POST HUNT YR	5	33	32
POST HUNT YR	6	33	32
POST HUNT YR	7	33	32
POST HUNT YR	8	33	32
POST HUNT YR	9	33	32
POST HUNT YR	10	33	32

NORTHWESTERN CALIF. ELK HERD SIMULATION- GENERAL, PLM, SHARE TAGS, 2019

(Combined Harvest for Del Norte and Humboldt cos)

Ratio = 37/100/32 - Maximum Calf Survival = 40%

THIS PROGRAM CALCULATES CHANGES IN HERD CHARACTERISTICS BASED ON VARIOUS HARVEST RATES.

CURRENT CONDITIONS = NO CHANGE. GENERAL, COOP ELK, SHARE AND PLM TAGS TO HARVEST APPROXIMATELY 44 BULLS AND 21 ANTLERLESS ELK

	HERD SIZE	1600	ELK
% BULLS LOST TO NON HUNTING CAUSES		23.5	%
% COWS LOST TO NON HUNTING CAUSES		11.9	%
% OF BULLS KILLED BY HUNTERS		12.55	%
% OF COWS KILLED BY HUNTERS		2.2	%

		BULLS	COWS	SURV. CALVES	TOTAL	K	BULLS HARVEST	COWS HARVEST
START	AUG	350	947	303	1600	1600	44	21
YEAR 1	"	350	949	370	1670	1760	44	21
YEAR 2	"	376	981	371	1728	1760	47	22
YEAR 3	"	393	1009	358	1760	1760	49	22
YEAR 4	"	400	1027	333	1760	1760	50	23
YEAR 5	"	395	1031	333	1760	1760	50	23
YEAR 6	"	392	1036	333	1760	1760	49	23
YEAR 7	"	389	1039	332	1760	1760	49	23
YEAR 8	"	387	1041	331	1760	1760	49	23
YEAR 9	"	386	1043	331	1760	1760	48	23
YEAR 10	"	385	1045	331	1760	1760	48	23

		BULL RATIO	CALF RATIO
START		37	32
POST HUNT YR	1	33	40
POST HUNT YR	2	34	39
POST HUNT YR	3	35	36
POST HUNT YR	4	35	33
POST HUNT YR	5	34	33
POST HUNT YR	6	34	33
POST HUNT YR	7	34	33
POST HUNT YR	8	33	33
POST HUNT YR	9	33	32
POST HUNT YR	10	33	32

NORTHWESTERN CALIF. ELK HERD SIMULATION- GENERAL, PLM, SHARE TAGS, 2019  
(Combined Harvest for Del Norte and Humboldt cos)

Ratio = 37/100/32 - Maximum Calf Survival = 40%

THIS PROGRAM CALCULATES CHANGES IN HERD CHARACTERISTICS BASED ON VARIOUS HARVEST RATES.

INCREASED PROPOSAL: ADD 24 BULL AND 36 ANTLERLESS (SHARE) TAGS TO HARVEST APPROXIMATELY 68 BULLS AND 57 ANTLERLESS ELK

	HERD SIZE	1600	ELK
% BULLS LOST TO NON HUNTING CAUSES		23.5	%
% COWS LOST TO NON HUNTING CAUSES		11.9	%
% OF BULLS KILLED BY HUNTERS		19.55	%
% OF COWS KILLED BY HUNTERS		6	%

		BULLS	COWS	SURV. CALVES	TOTAL	K	BULLS HARVEST	COWS HARVEST
START	AUG	350	947	303	1600	1600	44	21
YEAR 1	"	350	949	301	1600	1600	68	57
YEAR 2	"	331	918	351	1600	1600	65	55
YEAR 3	"	338	915	345	1598	1600	66	55
YEAR 4	"	340	910	344	1594	1600	66	55
YEAR 5	"	341	905	342	1588	1600	67	54
YEAR 6	"	341	900	340	1581	1600	67	54
YEAR 7	"	340	896	339	1574	1600	66	54
YEAR 8	"	339	891	337	1566	1600	66	53
YEAR 9	"	337	886	335	1558	1600	66	53
YEAR 10	"	336	881	333	1550	1600	66	53

		BULL RATIO	CALF RATIO
START		37	32
POST HUNT YR	1	32	34
POST HUNT YR	2	31	41
POST HUNT YR	3	32	40
POST HUNT YR	4	32	40
POST HUNT YR	5	32	40
POST HUNT YR	6	32	40
POST HUNT YR	7	32	40
POST HUNT YR	8	33	40
POST HUNT YR	9	33	40
POST HUNT YR	10	33	40

NORTHWESTERN CALIF. ELK HERD SIMULATION- GENERAL, PLM, SHARE TAGS, 2019  
(Combined Harvest for Del Norte and Humboldt cos)

Ratio = 37/100/32 - Maximum Calf Survival = 40%

THIS PROGRAM CALCULATES CHANGES IN HERD CHARACTERISTICS BASED ON VARIOUS HARVEST RATES.

INCREASED PROPOSAL: ADD 24 BULL AND 36 ANTLERLESS (SHARE) TAGS TO HARVEST APPROXIMATELY 68 BULLS AND 57 ANTLERLESS ELK

	HERD SIZE	1600	ELK
% BULLS LOST TO NON HUNTING CAUSES		23.5	%
% COWS LOST TO NON HUNTING CAUSES		11.9	%
% OF BULLS KILLED BY HUNTERS		19.55	%
% OF COWS KILLED BY HUNTERS		6	%

		BULLS	COWS	SURV. CALVES	TOTAL	K	BULLS HARVEST	COWS HARVEST
START	AUG	350	947	303	1600	1600	44	21
YEAR 1	"	350	949	370	1670	1760	68	57
YEAR 2	"	357	949	357	1663	1760	70	57
YEAR 3	"	356	943	357	1656	1760	70	57
YEAR 4	"	356	938	355	1649	1760	70	56
YEAR 5	"	355	933	353	1641	1760	69	56
YEAR 6	"	353	928	351	1632	1760	69	56
YEAR 7	"	352	923	349	1624	1760	69	55
YEAR 8	"	350	918	347	1615	1760	68	55
YEAR 9	"	348	913	345	1607	1760	68	55
YEAR 10	"	346	909	343	1598	1760	68	55

		BULL RATIO	CALF RATIO
START		37	32
POST HUNT YR	1	32	42
POST HUNT YR	2	32	40
POST HUNT YR	3	32	40
POST HUNT YR	4	32	40
POST HUNT YR	5	33	40
POST HUNT YR	6	33	40
POST HUNT YR	7	33	40
POST HUNT YR	8	33	40
POST HUNT YR	9	33	40
POST HUNT YR	10	33	40

NORTHWESTERN CALIF. ELK HERD SIMULATION- GENERAL, PLM, SHARE TAGS, 2019  
(Combined Harvest for Del Norte and Humboldt cos)

Ratio = 37/100/32 - Maximum Calf Survival = 40%

THIS PROGRAM CALCULATES CHANGES IN HERD

CHARACTERISTICS BASED ON VARIOUS HARVEST RATES.

PROPOSED PROJECT: ADD 8 BULL AND 12 ANTLERLESS (SHARE) TAGS TO HARVEST APPROXIMATELY 52 BULLS AND 33 ANTLERLESS ELK

	HERD SIZE	1600	ELK
% BULLS LOST TO NON HUNTING CAUSES		23.5	%
% COWS LOST TO NON HUNTING CAUSES		11.9	%
% OF BULLS KILLED BY HUNTERS		14.9	%
% OF COWS KILLED BY HUNTERS		3.5	%

		BULLS	COWS	SURV. CALVES	TOTAL	K	BULLS HARVEST	COWS HARVEST
START	AUG	350	947	303	1600	1600	44	21
YEAR 1	"	350	949	301	1600	1600	52	33
YEAR 2	"	343	939	318	1600	1600	51	33
YEAR 3	"	345	939	317	1600	1600	51	33
YEAR 4	"	346	937	317	1600	1600	51	33
YEAR 5	"	346	937	317	1600	1600	52	33
YEAR 6	"	347	936	317	1600	1600	52	33
YEAR 7	"	347	935	317	1600	1600	52	33
YEAR 8	"	347	935	317	1600	1600	52	33
YEAR 9	"	348	935	318	1600	1600	52	33
YEAR 10	"	348	935	318	1600	1600	52	33

		BULL RATIO	CALF RATIO
START		37	32
POST HUNT YR	1	33	33
POST HUNT YR	2	32	35
POST HUNT YR	3	32	35
POST HUNT YR	4	33	35
POST HUNT YR	5	33	35
POST HUNT YR	6	33	35
POST HUNT YR	7	33	35
POST HUNT YR	8	33	35
POST HUNT YR	9	33	35
POST HUNT YR	10	33	35

NORTHWESTERN CALIF. ELK HERD SIMULATION- GENERAL, PLM,SHARE TAGS, 2019  
(Combined Harvest for Del Norte and Humboldt cos)

Ratio = 37/100/32 - Maximum Calf Survival = 40%

THIS PROGRAM CALCULATES CHANGES IN HERD CHARACTERISTICS BASED ON VARIOUS HARVEST RATES.

PROPOSED PROJECT: ADD 8 BULL AND 12 ANTLERLESS (SHARE) TAGS TO HARVEST APPROXIMATELY 52 BULLS AND 33 ANTLERLESS ELK

	HERD SIZE	1600	ELK
% BULLS LOST TO NON HUNTING CAUSES		23.5	%
% COWS LOST TO NON HUNTING CAUSES		11.9	%
% OF BULLS KILLED BY HUNTERS		14.9	%
% OF COWS KILLED BY HUNTERS		3.5	%

		BULLS	COWS	SURV. CALVES	TOTAL	K	BULLS HARVEST	COWS HARVEST
START	AUG	350	947	303	1600	1600	44	21
YEAR 1	"	350	949	370	1670	1760	52	33
YEAR 2	"	370	970	366	1706	1760	55	34
YEAR 3	"	381	986	374	1741	1760	57	35
YEAR 4	"	391	1003	366	1760	1760	58	35
YEAR 5	"	394	1014	352	1760	1760	59	35
YEAR 6	"	391	1017	352	1760	1760	58	36
YEAR 7	"	389	1020	351	1760	1760	58	36
YEAR 8	"	388	1021	351	1760	1760	58	36
YEAR 9	"	387	1023	350	1760	1760	58	36
YEAR 10	"	386	1024	350	1760	1760	57	36

		BULL RATIO	CALF RATIO
START		37	32
POST HUNT YR	1	33	40
POST HUNT YR	2	34	39
POST HUNT YR	3	34	39
POST HUNT YR	4	34	38
POST HUNT YR	5	34	36
POST HUNT YR	6	34	36
POST HUNT YR	7	34	36
POST HUNT YR	8	33	36
POST HUNT YR	9	33	36
POST HUNT YR	10	33	35

NORTHWESTERN CALIF. ELK HERD SIMULATION- GENERAL, PLM, SHARE TAGS, 2019  
(Combined Harvest for Del Norte and Humboldt cos)

Ratio = 37/100/32 - Maximum Calf Survival = 40%

THIS PROGRAM CALCULATES CHANGES IN HERD CHARACTERISTICS BASED ON VARIOUS HARVEST RATES.

REDUCED PROPOSAL: ADD 4 BULL AND 6 ANTLERLESS (SHARE) TAGS TO HARVEST APPROXIMATELY 48 BULLS AND 27 ANTLERLESS ELK

	HERD SIZE	1600	ELK
% BULLS LOST TO NON HUNTING CAUSES		23.5	%
% COWS LOST TO NON HUNTING CAUSES		11.9	%
% OF BULLS KILLED BY HUNTERS		13.8	%
% OF COWS KILLED BY HUNTERS		2.85	%

		BULLS	COWS	SURV. CALVES	TOTAL	K	BULLS HARVEST	COWS HARVEST
START	AUG	350	947	303	1600	1600	44	21
YEAR 1	"	350	949	301	1600	1600	48	27
YEAR 2	"	346	945	309	1600	1600	48	27
YEAR 3	"	346	945	309	1600	1600	48	27
YEAR 4	"	347	945	309	1600	1600	48	27
YEAR 5	"	347	945	309	1600	1600	48	27
YEAR 6	"	347	944	309	1600	1600	48	27
YEAR 7	"	347	944	309	1600	1600	48	27
YEAR 8	"	347	944	309	1600	1600	48	27
YEAR 9	"	347	944	309	1600	1600	48	27
YEAR 10	"	347	944	309	1600	1600	48	27

		BULL RATIO	CALF RATIO
START		37	32
POST HUNT YR	1	33	33
POST HUNT YR	2	32	34
POST HUNT YR	3	33	34
POST HUNT YR	4	33	34
POST HUNT YR	5	33	34
POST HUNT YR	6	33	34
POST HUNT YR	7	33	34
POST HUNT YR	8	33	34
POST HUNT YR	9	33	34
POST HUNT YR	10	33	34

NORTHWESTERN CALIF. ELK HERD SIMULATION- GENERAL, PLM, SHARE TAGS, 2019  
(Combined Harvest for Del Norte and Humboldt cos)

Ratio = 37/100/32 - Maximum Calf Survival = 40%

THIS PROGRAM CALCULATES CHANGES IN HERD CHARACTERISTICS BASED ON VARIOUS HARVEST RATES.

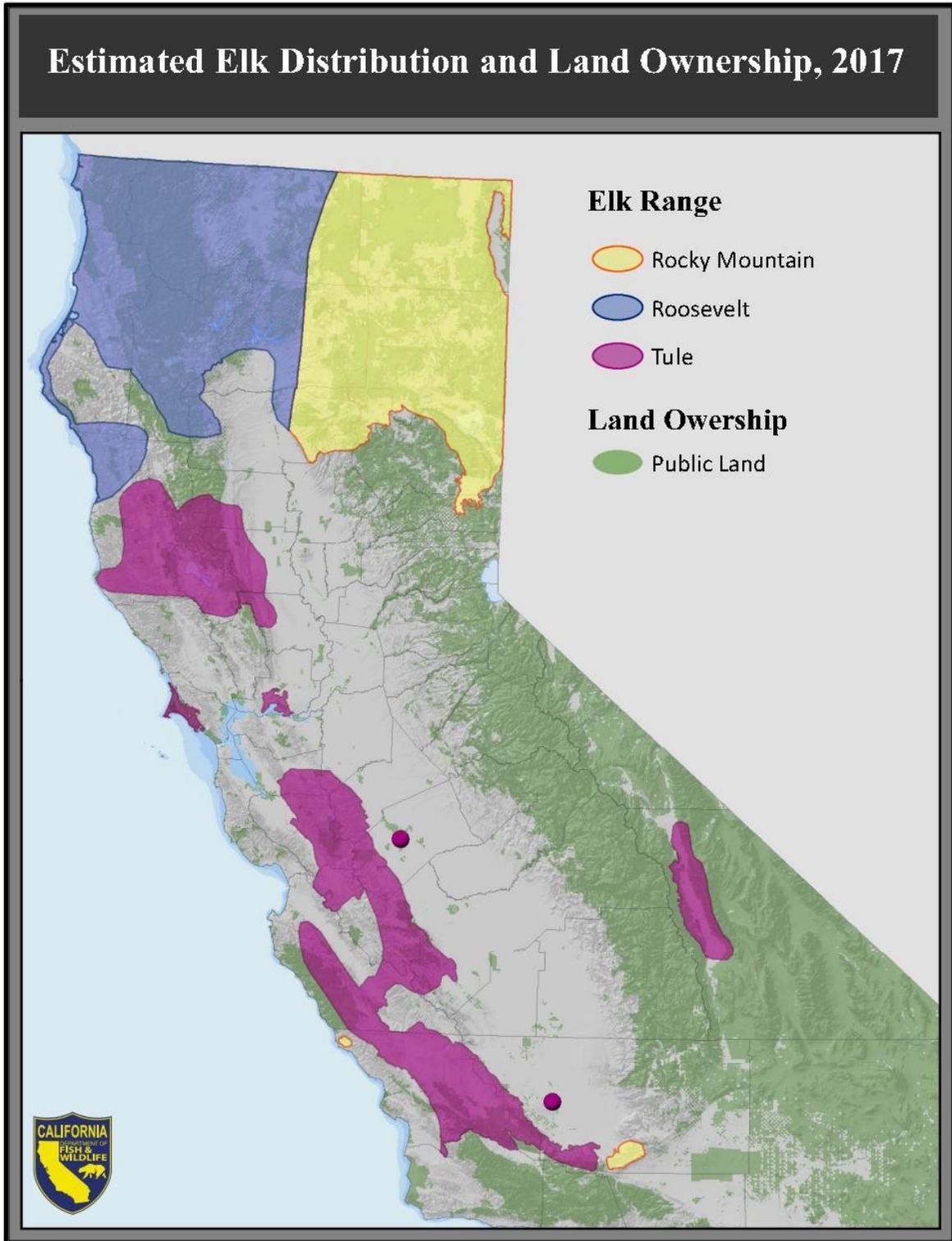
REDUCED PROPOSAL: ADD 4 BULL AND 6 ANTLERLESS (SHARE) TAGS TO HARVEST APPROXIMATELY 48 BULLS AND 27 ANTLERLESS ELK

	HERD SIZE	1600	ELK
% BULLS LOST TO NON HUNTING CAUSES		23.5	%
% COWS LOST TO NON HUNTING CAUSES		11.9	%
% OF BULLS KILLED BY HUNTERS		13.8	%
% OF COWS KILLED BY HUNTERS		2.85	%

		BULLS	COWS	SURV. CALVES	TOTAL	K	BULLS HARVEST	COWS HARVEST
START	AUG	350	947	303	1600	1600	44	21
YEAR 1	"	350	949	370	1670	1760	48	27
YEAR 2	"	373	975	369	1717	1760	51	28
YEAR 3	"	387	997	376	1760	1760	53	28
YEAR 4	"	399	1019	342	1760	1760	55	29
YEAR 5	"	394	1023	343	1760	1760	54	29
YEAR 6	"	391	1027	342	1760	1760	54	29
YEAR 7	"	389	1030	342	1760	1760	54	29
YEAR 8	"	387	1032	341	1760	1760	53	29
YEAR 9	"	386	1033	341	1760	1760	53	29
YEAR 10	"	385	1035	341	1760	1760	53	29

		BULL RATIO	CALF RATIO
START		37	32
POST HUNT YR	1	33	40
POST HUNT YR	2	34	39
POST HUNT YR	3	34	39
POST HUNT YR	4	35	35
POST HUNT YR	5	34	35
POST HUNT YR	6	34	34
POST HUNT YR	7	34	34
POST HUNT YR	8	33	34
POST HUNT YR	9	33	34
POST HUNT YR	10	33	34

Appendix 4. Estimated Elk Distribution and Land Ownership, 2017



## Appendix 5. Current Elk Hunting Regulations

### §364, Title 14, CCR. Elk.

- (a) Department Administered General Methods Roosevelt Elk Hunts:
  - (1) Siskiyou General Methods Roosevelt Elk Hunt:
    - (A) Area: In that portion of Siskiyou County beginning at the junction of Interstate Highway 5 with the California-Oregon state line; east along the state line to Hill Road at Ainsworth Corner; south along Hill Road to Lava Beds National Monument Road; south along Lava Beds National Monument Road to USDA Forest Service Road 49; south along USDA Forest Service Road 49 to USDA Forest Service Road 77; west along USDA Forest Service Road 77 to USDA Forest Service Road 15 (Harris Spring Road); south along USDA Forest Service Road 15 to USDA Forest Service Road 13 (Pilgrim Creek Road); southwest along USDA Forest Service Road 13 to Highway 89; northwest along Highway 89 to Interstate Highway 5; north along Interstate Highway 5 to the point of beginning.
  - (2) Northwestern California Roosevelt Elk Hunt:
    - (A) Area: In those portions of Humboldt and Del Norte counties within a line beginning at the intersection of Highway 299 and Highway 96, north along Highway 96 to the Del Norte-Siskiyou county line, north along the Del Norte-Siskiyou county line to the California-Oregon state line, west along the state line to the Pacific Coastline, south along the Pacific coastline to the Humboldt-Mendocino county line, east along the Humboldt-Mendocino county line to the Humboldt-Trinity county line, north along the Humboldt-Trinity county line to Highway 299, west along Highway 299 to the point of beginning.
  - (3) Marble Mountains General Methods Roosevelt Elk Hunt
    - (A) Area: In those portions of Humboldt, Tehama, Trinity, Shasta and Siskiyou counties beginning at the intersection of Interstate Highway 5 and the California-Oregon state line; west along the state line to the Del Norte County line; south along the Del Norte County line to the intersection of the Siskiyou-Humboldt county lines; east along the Siskiyou-Humboldt county lines to Highway 96; south along Highway 96 to Highway 299; south along Highway 299 to the Intersection of the Humboldt/Trinity County line; south along the Humboldt Trinity County Line to the intersection of Highway 36; east along Highway 36 to the intersection of Interstate 5; north on Interstate Highway 5 to the point of beginning.
- (b) Department Administered General Methods Rocky Mountain Elk Hunts:
  - (1) Northeastern California General Methods Rocky Mountain Elk Hunt:
    - (A) Area: Those portions of Siskiyou, Modoc, Lassen, and Shasta counties within a line beginning in Siskiyou County at the junction of the California-Oregon state line and Hill Road at Ainsworth Corner; east along the California-Oregon state line to the California-Nevada state line; south along the California-Nevada state line to the Tuledad-Red Rock-Clarks Valley Road (Lassen County Roads 506, 512 and 510); west along the Tuledad-Red Rock-Clarks Valley Road to Highway 395 at Madeline; west on USDA Forest Service Road 39N08 to the intersection of Highway 139/299 in Adin; south on Highway 139 to the intersection of Highway 36 in Susanville; west on Highway 36 to the intersection of Interstate 5 in Red Bluff; north on Interstate 5 to Highway 89; southeast along Highway 89 to USDA Forest Service Road 13 (Pilgrim Creek Road); northeast along USDA Forest Service Road 13 to USDA Forest Service Road 15 (Harris Spring Road); north along USDA Forest Service Road to USDA Forest Service Road 77; east along USDA Forest Service Road 77 to USDA Forest Service Road 49; north along USDA Forest Service Road 49 to Lava Beds National Monument Road; north along Lava Beds National Monument Road to Hill Road; north along Hill Road to the point of beginning.
- (c) Department Administered General Methods Roosevelt/Tule Elk Hunts:
  - (1) Mendocino General Methods Roosevelt/Tule Elk Hunt:
    - (A) Area: Those portions in Mendocino County within a line beginning at the Pacific Coastline and the Mendocino/Humboldt County line south of Shelter Cove; east along

the Mendocino/Humboldt County line to the intersection of the Humboldt, Mendocino, and Trinity County lines; south and east along the Mendocino/Trinity County line to the intersection of the Mendocino, Trinity, and Tehama County lines; south along the Mendocino County line to the intersection of Highway 20; north and west along Highway 20 to the intersection of Highway 101 near Calpella; south along Highway 101 to the intersection of Highway 253; southwest along Highway 253 to the intersection of Highway 128; north along Highway 128 to the intersection of Mountain View Road near the town of Boonville; west along Mountain View Road to the intersection of Highway 1; south along Highway 1 to the intersection of the Garcia River; west along the Garcia River to the Pacific Coastline; north along the Pacific Coastline to the point of beginning.

- (d) Department Administered General Methods Tule Elk Hunts:
  - (1) Cache Creek General Methods Tule Elk Hunt:
    - (A) Area: Those portions of Lake, Colusa and Yolo counties within the following line: beginning at the junction of Highway 20 and Highway 16; south on Highway 16 to Reiff-Rayhouse Road; west on Reiff-Rayhouse Road to Morgan Valley Road; west on Morgan Valley Road to Highway 53; north on Highway 53 to Highway 20; east on Highway 20 to the fork of Cache Creek; north on the north fork of Cache Creek to Indian Valley Reservoir; east on the south shore of Indian Valley Reservoir to Walker Ridge-Indian Valley Reservoir Access Road; east on Walker Ridge-Indian Valley Reservoir Access Road to Walker Ridge Road; south on Walker Ridge Road to Highway 20; east on Highway 20 to the point of beginning.
  - (2) La Panza General Methods Tule Elk Hunt:
    - (A) Area: In those portions of San Luis Obispo, Kern, Monterey, Kings, Fresno, San Benito, and Santa Barbara counties within a line beginning in San Benito County at the junction of Highway 25 and County Highway J1 near the town Pacines, south along Highway 25 to La Gloria road, west along La Gloria road, La Gloria road becomes Gloria road, west along Gloria road to Highway 101 near Gonzales, south along Highway 101 to Highway 166 in San Luis Obispo County; east along Highway 166 to Highway 33 at Maricopa in Kern County; north and west along Highway 33 to Highway 198 at Coalinga in Fresno County, north along Highway 33 to Interstate 5 in Fresno County, north along Interstate 5 to Little Panoche road/County Highway J1, southwest along Little Panoche road/County Highway J1 to the intersection of Little Panoche road/County Highway J1 and Panoche road/County Highway J1 in San Benito County, northwest along Panoche road/County Highway J1 to the point of beginning.
    - (B) Special Conditions: All tagholders will be required to attend a mandatory orientation. Tagholders will be notified of the time and location of the orientation meeting upon receipt of their elk license tags.
  - (3) Bishop General Methods Tule Elk Hunt:
    - (A) Area: In that portion of Inyo County beginning at the junction of Highway 395 and Highway 6 in the town of Bishop; north and east along Highway 6 to the junction of Silver Canyon Road; east along Silver Canyon Road to the White Mountain Road (Forest Service Road 4S01); south along the White Mountain Road to Highway 168 at Westgard Pass; south and west along Highway 168 to the junction of Highway 395; north on Highway 395 to the point of beginning.
  - (4) Independence General Methods Tule Elk Hunt:
    - (A) Area: In that portion of Inyo County beginning at the junction of Highway 395 and Aberdeen Station Road; east on Aberdeen Station Road to its terminus at the southern boundary of Section 5, Township 11S, Range 35E; east along the southern boundary of sections 5, 4, 3, and 2, Township 11S, Range 35E to the Papoose Flat Road at Papoose Flat; south and east on Papoose Flat Road to Mazourka Canyon Road; south and then west on Mazourka Canyon Road to Highway 395; north along Highway 395 to the point of beginning.
  - (5) Lone Pine General Methods Tule Elk Hunt:
    - (A) Area: In that portion of Inyo County beginning at the junction of Highway 395 and Mazourka Canyon Road; east and then north on Mazourka Canyon Road to the Inyo National Forest Boundary at the junction of the southern boundary of Township 12S

- and the northern boundary of Township 13S; east along the southern boundary of Township 12S to Saline Valley Road; south on Saline Valley Road to Highway 190; north and then southwest on Highway 190 to the junction of Highway 395 at Olancho; north on Highway 395 to the point of beginning.
- (6) Tinemaha General Methods Tule Elk Hunt:
    - (A) Area: In that portion of Inyo County beginning at the junction of Highway 395 and Highway 168 in the town of Big Pine; north and east along Highway 168 to the junction of the Death Valley Road; south and east along the Death Valley Road to the junction of the Papoose Flat Road; south along the Papoose Flat Road to the southern boundary of Section 2, Township 11S, Range 35E; west along the southern boundaries of sections 2, 3, 4 and 5 to the terminus of the Aberdeen Station Road in Section 5, Township 11S, Range 35E; south and west along the Aberdeen Station Road to Highway 395; north along Highway 395 to the point of beginning.
  - (7) West Tinemaha General Methods Tule Elk Hunt:
    - (A) Area: In that portion of Inyo County beginning at the junction of Highway 395 and Highway 168 in the town of Big Pine; south along Highway 395 to the north junction of Fish Springs Road; south along Fish Springs Road to the junction of Highway 395; south along Highway 395 to Taboose Creek in Section 14, Township 11S, Range 34E; west along Taboose Creek to the Inyo County line; north and west along the Inyo County line to the intersection of Tinemaha Creek; east along Tinemaha Creek to the intersection of McMurray Meadow Road; north on McMurray Meadow Road to the intersection of Glacier Lodge Road; north and east on Glacier Lodge Road to Crocker Avenue; east along Crocker Avenue to Highway 395; north along Highway 395 to the point of beginning.
  - (8) Tinemaha Mountain General Methods Tule Elk Hunt:
    - (A) Area: In that portion of Inyo County with a line beginning at the intersection of Glacier Lodge Road (9S21) and McMurray Meadow Road (9S03); south on McMurray Meadow Road to Tinemaha Creek; west along Tinemaha Creek to the Inyo County line; north and west along the Inyo County line to the southeast corner of Section 23, Township 10S, Range 32E; north along the eastern boundaries of sections 23, 14, 11, 2, Township 10S, Range 32E, and the eastern boundary of Section 36, Township 9S, Range 32E to Glacier Lodge Road; east along Glacier Lodge Road to the beginning.
  - (9) Whitney General Methods Tule Elk Hunt:
    - (A) Area: In that portion of Inyo County with a line beginning at the intersection of Highway 395 and Onion Valley Road; south on Highway 395 to the intersection of Whitney Portal Road; west along Whitney Portal Road to the northern boundary of Section 36, Township 15S, Range 34E; west along the northern boundary of sections 36, 35, 34 and 33 Township 15S, Range 34 E to the Inyo County Line; north along the Inyo County Line to the intersection of Section 27 Township 13S, range 33E; east along the southern boundary of sections 27, 26 and 25 Township 13S, Range 33E; north along the eastern boundary of Section 25 Township 13S, Range 33E to the intersection of Onion Valley Road; east along Onion Valley Road to the point of beginning.
  - (10) Goodale General Methods Tule Elk Hunt:
    - (A) Area: In that portion of Inyo County beginning at the junction of Highway 395 and Onion Valley Road; west along Onion Valley Road to the intersection of the Section 25 Township 13S, Range 33E; south along the eastern boundary of Section 25 Township 13S, Range 33E to the southern boundary of Section 25 Township 13S, Range 33E; west along the southern boundary of sections 27, 26, 25 Township 13S, Range 33E to the Inyo County line; North along the Inyo County Line to Taboose Creek; east along Taboose Creek to the intersection of Highway 395; south along Highway 395 to the point of beginning.
  - (11) Grizzly Island General Methods Tule Elk Hunt:
    - (A) Area: Those lands owned and managed by the Department of Fish and Game as the Grizzly Island Wildlife Area.



- Mendocino-Lake County line to Highway 20; southeast on Highway 20 to the intersection of Bartlett Springs Road; north and east along Bartlett Springs Road to the intersection of Forest Route M5; northwest on Forest Route M5 to the Colusa-Lake County Line; northwest and east on the Colusa-Lake County Line to the junction of the Glenn-Colusa County Line and the Lake-Glenn County Line; north and west on the Lake-Glenn County Line to the point of beginning.
- (17) Santa Clara General Methods Tule Elk Hunt:
    - (A) Area: Those portions of Merced, Santa Clara, and Stanislaus Counties within the following line: beginning at the intersection of the Interstate 5 and the San Joaquin/Stanislaus County line; southeast along Interstate 5 to the intersection of Highway 152; west along Highway 152 to the intersection of Highway 101 near the town of Gilroy; north along Highway 101 to the intersection of Interstate 680 near San Jose; north along Interstate 680 to the intersection of the Alameda/Santa Clara County line; east along the Alameda/Santa Clara County line to the intersection of the San Joaquin, Stanislaus, Alameda, Santa Clara County lines; northeast along the San Joaquin/Stanislaus County line to the point of beginning.
  - (18) Alameda General Methods Tule Elk Hunt:
    - (A) Area: Those portions of Alameda and San Joaquin Counties within the following line: beginning at the intersection of the Interstate 5 and the San Joaquin/Stanislaus County line; southwest along the San Joaquin/Stanislaus County line to the intersection of the San Joaquin, Stanislaus, Alameda, Santa Clara County lines; west along the Alameda/Santa Clara County Line to the intersection of Interstate 680; north along Interstate 680 to the intersection of Interstate 580; east and south along Interstate 580 to the intersection of Interstate 5; south along Interstate 5 to the point of beginning.
  - (e) Department Administered General Methods Apprentice Elk Hunts:
    - (1) Marble Mountains General Methods Roosevelt Elk Apprentice Hunt:
      - (A) Area: The tag shall be valid in the area described in subsection 364(a)(3)(A).
      - (B) Special Conditions: Only persons possessing valid junior hunting licenses may apply for Apprentice Hunt license tags. Apprentice Hunt tagholders shall be accompanied by a nonhunting, licensed adult chaperon 18 years of age or older while hunting.
    - (2) Northeastern California General Methods Rocky Mountain Elk Apprentice Hunt:
      - (A) Area: The tag shall be valid in the area described in subsection 364(b)(1)(A).
      - (B) Special Conditions: Only persons possessing valid junior hunting licenses may apply for Apprentice Hunt License tags. Apprentice Hunt tagholders shall be accompanied by a nonhunting, licensed adult chaperon 18 years of age or older while hunting.
    - (3) Cache Creek General Methods Tule Elk Apprentice Hunt:
      - (A) Area: The tag shall be valid in the area described in subsection 364(d)(1)(A).
      - (B) Special Conditions:
        - 1. Only persons possessing valid junior hunting licenses may apply for Apprentice Hunt license tags. Apprentice Hunt tagholders shall be accompanied by a nonhunting, licensed adult chaperon 18 years of age or older while hunting.
    - (4) La Panza General Methods Tule Elk Apprentice Hunt:
      - (A) Area: The tag shall be valid in the area described in subsection 364(d)(2)(A).
      - (B) Special Conditions:
        - 1. All tagholders will be required to attend a mandatory orientation. Tagholders will be notified of the time and location of the orientation meeting after receipt of their elk license tags.
        - 2. Only persons possessing valid junior hunting licenses may apply for Apprentice Hunt license tags. Apprentice Hunter tagholders shall be accompanied by a nonhunting, licensed adult chaperon 18 years of age or older while hunting.
    - (5) Bishop General Methods Tule Elk Apprentice Hunt:
      - (A) Area: The tag shall be valid in the area described in subsection 364(d)(3)(A).



- (C) Elk may be taken with Muzzleloader Equipment only as specified in Section 353.
  - (h) Department Administered Muzzleloader/Archery Only Elk Hunts:
    - (1) Marble Mountains Muzzleloader/Archery Only Roosevelt Elk Hunt.
      - (A) Area: The tag shall be valid in the area described in subsection 364(a)(3)(A).
      - (B) Special Conditions: Elk may be taken with archery or muzzleloader equipment only as specified in Sections 353 and 354.
  - (i) Fund Raising Elk Hunts:
    - (1) Multi-zone Fund Raising Elk Hunt.
      - (A) Area: The tag shall be valid in the areas described in subsections 364(a)(1)(A), (a)(2)(A), (a)(3)(A), (b)(1)(A), and (d)(2)(A).
    - (2) Grizzly Island Fund Raising Tule Elk Hunt.
      - (A) Area: The tag shall be valid in the area described in subsection 364(d)(11)(A).
      - (B) Special Conditions: Advance reservations required by contacting the Grizzly Island Wildlife Area by telephone at (707) 425-3828.
    - (3) Owens Valley Fund Raising Tule Elk Hunt
      - (A) Area: The tag shall be valid in areas described in subsections 364(d)(3)(A), (d)(4)(A), (d)(5)(A), (d)(6)(A), (d)(7)(A), (d)(8)(A), (d)(9)(A), and (d)(10)(A).
  - (j) Military Only Elk Hunts. These hunts are sponsored and tag quotas are set by the Department. The tags are assigned and the hunts are administered by the Department of Defense.
    - (1) Fort Hunter Liggett Military Only General Methods Tule Elk Hunt:
      - (A) Area: The tag shall be valid in the area described in subsection 364(d)(12)(A).
      - (B) Special Conditions: See subsection 364(p).
    - (2) Fort Hunter Liggett Military Only General Methods Tule Elk Apprentice Hunt:
      - (A) Area: The tag shall be valid in the area described in subsection 364(d)(12)(A).
      - (B) Special Conditions: See subsection 364(p).
      - (C) Only persons possessing valid junior hunting licenses may apply for Apprentice Hunt license tags. Apprentice Hunt tagholders shall be accompanied by a nonhunting, licensed adult chaperon 18 years of age or older while hunting.
    - (3) Fort Hunter Liggett Military Only Archery Only Tule Elk Hunt:
      - (A) Area: The tag shall be valid in the area described in subsection 364(d)(12)(A).
      - (B) Special Conditions: See subsection 364(p).
      - (C) Elk may be taken with Archery Equipment only as specified in Section 354.
    - (4) Fort Hunter Liggett Military Only Muzzleloader Only Tule Elk Hunt:
      - (A) Area: The tag shall be valid in the area described in subsection 364(d)(12)(A).
      - (B) Special Conditions: See subsection 364(p).
  - (k) Bag and Possession Limit: Each elk tag is valid only for one elk per season and only in the hunt area drawn.
  - (l) Definitions:
    - (1) Bull elk: Any elk having an antler or antlers at least four inches in length as measured from the top of the skull.
    - (2) Spike bull: A bull elk having no more than one point on each antler. An antler point is a projection of the antler at least one inch long and longer than the width of its base.
    - (3) Antlerless elk: Any elk, with the exception of spotted calves, with antlers less than four inches in length as measured from the top of the skull.
    - (4) Either-sex elk: For the purposes of these regulations, either-sex is defined as bull elk, spike elk, or antlerless elk.
  - (m) Method of Take: Only methods for taking elk as defined in Sections 353 and 354 may be used.
  - (n) Tagholder Responsibilities:
    - (1) No tagholder shall take or possess any elk or parts thereof governed by the regulations except herein provided.
    - (2) The department reserves the right to use any part of the tagholder's elk for biological analysis as long as the amount of edible meat is not appreciably decreased.
    - (3) Any person taking an elk which has a collar or other marking device attached to it shall provide the department with such marking device within 10 days of taking the elk.
  - (o) The use of dogs to take or attempt to take elk is prohibited.
  - (p) Fort Hunter Liggett Special Conditions:

- (1) All tagholders hunting within the exterior boundaries of Fort Hunter Liggett will be required to attend a mandatory hunter orientation. Tagholders will be notified of the time and location of the orientation meeting upon receipt of their elk license tags.
- (2) Tagholders hunting within the exterior boundaries of Fort Hunter Liggett shall be required to purchase an annual hunting pass available from Fort Hunter Liggett.
- (3) All successful tagholders hunting within the exterior boundaries of Fort Hunter Liggett will be required to have their tags validated on Fort Hunter Liggett prior to leaving.
- (4) Due to military operations and training, the specified season dates within the exterior boundaries of Fort Hunter Liggett are subject to further restriction, cancellation, or may be rescheduled, between August 1 and January 31, by the Commanding Officer.

- (q) [subsection reserved]

<b>(r) Department Administered General Methods Roosevelt Elk Hunts</b>						
<b>Hunt</b>		<b>1. Bull Tags</b>	<b>2. Antlerless Tags</b>	<b>3 Either-Sex Tags</b>	<b>4. Spike Tags</b>	<b>5. Season</b>
(1)(A) Siskiyou		20	20			Shall open on the Wednesday preceding the second Saturday in September and continue for 12 consecutive days.
(2)(A) Northwestern		15	0	3		Shall open on the first Wednesday in September and continue for 23 consecutive days.
(3)(A) Marble Mountains		35	10			Shall open on the Wednesday preceding the second Saturday in September and continue for 12 consecutive days.
<b>(s) Department Administered General Methods Rocky Mountain Elk Hunts</b>						
<b>Hunt</b>		<b>1. Bull Tags</b>	<b>2. Antlerless Tags</b>	<b>3 Either-Sex Tags</b>	<b>4. Spike Tags</b>	<b>5. Season</b>
(1)	(A) Northeastern California Bull	15				The bull season shall open on the Wednesday preceding the third Saturday in September and continue for 12 consecutive days.
	(B) Northeastern California Antlerless		10			The antlerless season shall open on the second Wednesday in November and continue for 12 consecutive days.

<b>(t) Department Administered General Methods Roosevelt/Tule Elk Hunts</b>					
<b>Hunt</b>	<b>1. Bull Tags</b>	<b>2. Antlerless Tags</b>	<b>3 Either-Sex Tags</b>	<b>4. Spike Tags</b>	<b>5. Season</b>
(1)(A) Mendocino	2	0			The season shall open on the Wednesday preceding the fourth Saturday in September and continue for 12 consecutive days.
<b>(u) Department Administered General Methods Tule Elk Hunts</b>					
<b>Hunt</b>	<b>1. Bull Tags</b>	<b>2. Antlerless Tags</b>	<b>3 Either-Sex Tags</b>	<b>4. Spike Tags</b>	<b>5. Season</b>
(1) Cache Creek					
(A) Bull	2				The Bull season shall open on the second Saturday in October and continue for 16 consecutive days.
(B) Antlerless		2			The Antlerless season shall open on the third Saturday in October and continue for 16 consecutive days.
(2) La Panza					
(A) Period 1	6	5			Shall open on the second Saturday in October and extend for 23 consecutive days.
(B) Period 2	6	6			Shall open on the second Saturday in November and extend for 23 consecutive days.
(3) Bishop					
(A) Period 3	0	0			Shall open on the third Saturday in October and extend for 9 consecutive days.
(B) Period 4	0	0			Shall open on the first Saturday in November and extend for 9 consecutive days.
(C) Period 5	0	0			Shall open on the first Saturday in December and continue for 9 consecutive days.
(4) Independence					

	(A) Period 2	1	1			Shall open on the first Saturday in October and extend for 9 consecutive days.
	(B) Period 3	1	1			Shall open on the third Saturday in October and extend for 9 consecutive days.
	(C) Period 4	0	1			Shall open on the first Saturday in November and extend for 9 consecutive days.
	(D) Period 5	0	0			Shall open on the first Saturday in December and continue for 9 consecutive days.
(5)	Lone Pine					
	(A) Period 2	1	1			Shall open on the first Saturday in October and extend for 9 consecutive days.
	(B) Period 3	1	1			Shall open on the third Saturday in October and extend for 9 consecutive days.
	(C) Period 4		0			Shall open on the first Saturday in November and extend for 9 consecutive days.
	(D) Period 5	0	0			Shall open on the first Saturday in December and continue for 9 consecutive days.
(6)	Tinemaha					
	(A) Period 2	0	0			Shall open on the first Saturday in October and extend for 9 consecutive days.
	(B) Period 3	0	0			Shall open on the third Saturday in October and extend for 9 consecutive days.
	(C) Period 4	0	0			Shall open on the first Saturday in November and extend for 9 consecutive days.
	(D) Period 5	0	0			Shall open on the first Saturday in December and continue for 9 consecutive days.
(7)	West Tinemaha					
	(A) Period 1	0	0			Shall open on the second Saturday in September and extend for 16 consecutive days.

	(B) Period 2	0	0			Shall open on the first Saturday in October and extend for 9 consecutive days.
	(C) Period 3	0	0			Shall open on the third Saturday in October and extend for 9 consecutive days.
	(D) Period 4	0	0			Shall open on the first Saturday in November and extend for 9 consecutive days.
	(E) Period 5	0	0			Shall open on the first Saturday in December and continue for 9 consecutive days.
(8)	Tinemaha Mountain					
	(A) Period 1	0				Shall open on the second Saturday in September and extend for 16 consecutive days.
	(B) Period 2	0				Shall open on the first Saturday in October and extend for 9 consecutive days.
	(C) Period 3	0				Shall open on the third Saturday in October and extend for 9 consecutive days.
	(D) Period 4	0				Shall open on the first Saturday in November and extend for 9 consecutive days.
	(E) Period 5	0				Shall open on the first Saturday in December and continue for 9 consecutive days.
(9)	Whitney					
	(A) Period 2	0	1			Shall open on the first Saturday in October and extend for 9 consecutive days.
	(B) Period 3	0	0			Shall open on the third Saturday in October and extend for 9 consecutive days.
	(C) Period 4	0	0			Shall open on the first Saturday in November and extend for 9 consecutive days.
	(D) Period 5	0	0			Shall open on the first Saturday in December and continue for 9 consecutive days.
(10)	Goodale					

	(A) Period 1	0	0			Shall open on the second Saturday in September and extend for 16 consecutive days.
	(B) Period 2	0	1			Shall open on the first Saturday in October and extend for 9 consecutive days.
	(C) Period 3	0	1			Shall open on the third Saturday in October and extend for 9 consecutive days.
	(D) Period 4	0	0			Shall open on the first Saturday in November and extend for 9 consecutive days.
	(E) Period 5	0	0			Shall open on the first Saturday in December and extend for 9 consecutive days
(11)	Grizzly Island					
	(A) Period 1	0	6		0	Shall open on the second Tuesday after the first Saturday in August and continue for 4 consecutive days.
	(B) Period 2	0	2		4	Shall open on the first Thursday following the opening of period one and continue for 4 consecutive days.
	(C) Period 3	0	6		0	Shall open on the first Tuesday following the opening of period two and continue for 4 consecutive days.
	(D) Period 4	0	4		2	Shall open on the first Thursday following the opening of period three and continue for 4 consecutive days.
	(E) Period 5	0	8		0	Shall open on the first Tuesday following the opening of period four and continue for 4 consecutive days.
	(F) Period 6	0	0		0	Shall open on the first Thursday following the opening of period five and continue for 4 consecutive days.
	(G) Period 7	0	8		0	Shall open on the first Tuesday following the opening of period six and continue for 4 consecutive days.
	(H) Period 8	0	0		6	Shall open on the first Thursday following the opening

						of period seven and continue for 4 consecutive days.
	(I) Period 9	0	8		0	Shall open on the first Tuesday following the opening of period eight and continue for 4 consecutive days.
	(J) Period 10	3	0		0	Shall open on the first Thursday following the opening of period nine and continue for 4 consecutive days.
	(K) Period 11	0	8		0	Shall open on the first Tuesday following the opening of period ten and continue for 4 consecutive days.
	(L) Period 12	3			0	Shall open on the first Thursday following the opening of period eleven and continue for 4 consecutive days.
	(M) Period 13	0	8		0	Shall open on the first Tuesday following the opening of period twelve and continue for 4 consecutive days.
(12)	Fort Hunter Liggett General Public					
	(A) Period 1	0	0			Shall open on the first Thursday in November and continue for 9 consecutive days.
	(B) Period 2	0	0			Shall open on November 22 and continue for 9 consecutive days.
	(C) Period 3	0	0			Shall open on the third Saturday in December and continue for 16 consecutive days.
(13)	(A) East Park Reservoir	2	2			Shall open on the first Saturday in September and continue for 27 consecutive days.
(14)	(A) San Luis Reservoir	0	0	5		Shall open on the first Saturday in October and continue for 23 consecutive days.
(15)	(A) Bear Valley	2	1			Shall open on the second Saturday in October and continue for 9 consecutive days.
(16)	Lake Pillsbury					

	(A) Period 1		4			Shall open on the Wednesday preceding the second Saturday in September and continue for 10 consecutive days.
	(B) Period 2	2				Shall open Monday following the fourth Saturday in September and continue for 10 consecutive days.
	(17)(A) Santa Clara	0	0			Shall open on the second Saturday in October and continue for 16 consecutive days.
	(18)(A) Alameda	0	0			Shall open on the second Saturday in October and continue for 16 consecutive days.
<b>(v) Department Administered Apprentice Hunts</b>						
	<b>Hunt</b>	<b>1. Bull Tags</b>	<b>2. Antlerless Tags</b>	<b>3. Either-Sex Tags</b>	<b>4. Spike Tags</b>	<b>5. Season</b>
	(1)(A) Marble Mountain General Methods Roosevelt Elk Apprentice			2		Shall open on the Wednesday preceding the second Saturday in September and continue for 12 consecutive days.
	(2)(A) Northeast California General Methods Rocky Elk Apprentice			2		Shall open on the Wednesday preceding the third Saturday in September and continue for 12 consecutive days.
	(3)(A) Cache Creek General Methods Tule Elk Apprentice	1	0			Shall open on the second Saturday in October and continue for 16 consecutive days.
	(4)(A) La Panza General Methods Tule Elk Apprentice	0	1			Shall open on the second Saturday in October and extend for 23 consecutive days.
	(5)(A) Bishop General Methods Tule Elk Apprentice Period 2	0	0			Shall open on the first Saturday in October and extend for 9 consecutive days.
(6)	Grizzly Island General Methods Tule Elk Apprentice					
	(A) Period 1		3		0	Shall open on the second Tuesday after the first Saturday in August and continue for 4 consecutive days.
	(B) Period 2		0		2	Shall open on the first Thursday following the opening

						of period one and continue for 4 consecutive days.
	(C) Period 3		3		0	Shall open on the first Tuesday following the opening of period two and continue for 4 consecutive days.
	(D) Period 4		0		2	Shall open on the first Thursday following the opening of period three and continue for 4 consecutive days.
	(7)(A) Fort Hunter Liggett General Public General Methods Apprentice	0	0			Shall open on the third Saturday in December and continue for 16 consecutive days.
<b>(w) Department Administered Archery Only Hunts</b>						
<b>Hunt</b>	<b>1. Bull Tags</b>	<b>2. Antlerless Tags</b>	<b>3. Either-Sex Tags</b>	<b>4. Spike Tags</b>	<b>5. Season</b>	
(1)(A) Northeast California Archery Only	0	0	10			Shall open on the Wednesday preceding the first Saturday in September and continue for 12 consecutive days.
(2)(A) Owens Valley Multiple Zone Archery Only	3	0				Shall open on the second Saturday in August and extend for 9 consecutive days.
(3)(A) Lone Pine Archery Only Period 1	0	1				Shall open on the second Saturday in September and extend for 16 consecutive days.
(4)(A) Tinemaha Archery Only Period 1	0	0				Shall open on the second Saturday in September and extend for 16 consecutive days.
(5)(A) Whitney Archery Only Period 1	0	0				Shall open on the second Saturday in September and extend for 16 consecutive days.
(6)	Fort Hunter Liggett					
(A) General Public Archery Only Either Sex				3		Shall open on the last Wednesday in July and continue for 9 consecutive days.
(B) General Public Archery Only Antlerless		4				Shall open on the Tuesday preceding the fourth Thursday in November and continue for 9 consecutive days.

<b>(x) Department Administered Muzzleloader Only Tule Elk Hunts</b>					
<b>Hunt</b>	<b>1. Bull Tags</b>	<b>2. Antlerless Tags</b>	<b>3 Either-Sex Tags</b>	<b>4. Spike Tags</b>	<b>5. Season</b>
(1)(A) Bishop Muzzleloader Only Period 1	0	0			Shall open on the second Saturday in September and extend for 16 consecutive days.
(2)(A) Independence Muzzleloader Only Period 1	1	0			Shall open on the second Saturday in September and extend for 16 consecutive days.
(3)(A) Goodale Muzzleloader Only Period 1	0	1			Shall open on the second Saturday in September and extend for 16 consecutive days.
(4)(A) Fort Hunter Liggett General Public Muzzleloader Only	0	0			Shall open on the third Saturday in December and continue for 17 consecutive days.
<b>(y) Department Administered Muzzleloader/Archery Only Hunts</b>					
<b>Hunt</b>	<b>1. Bull Tags</b>	<b>2. Antlerless Tags</b>	<b>3 Either-Sex Tags</b>	<b>4. Spike Tags</b>	<b>5. Season</b>
(1)(A) Marble Mountain Muzzleloader/Archery Roosevelt Elk			5		Shall open on the last Saturday in October and extend for 9 consecutive days.
<b>(z) Fund Raising Elk Tags</b>					
<b>Hunt</b>	<b>1. Bull Tags</b>	<b>2. Antlerless Tags</b>	<b>3 Either-Sex Tags</b>	<b>4. Spike Tags</b>	<b>5. Season</b>
(1)(A) Multi-zone Fund Raising Tags	1				<p>Siskiyou and Marble Mountains Roosevelt Elk Season shall open on the Wednesday preceding the first Saturday in September and continue for 19 consecutive days.</p> <p>Northwestern Roosevelt Elk Season shall open on the last Wednesday in August and continue for 30 consecutive days.</p> <p>Northeastern Rocky Mountain Elk Season shall open on the</p>

					<p>Wednesday preceding the last Saturday in August and continue for 33 consecutive days.</p> <p>La Panza Tule Elk Season shall open on the first Saturday in October and extend for 65 consecutive days.</p>
(2)(A) Grizzly Island Fund Raising Tags	1				Shall open on the first Saturday in August and continue for 30 consecutive days
(3)(A) Owens Valley Fund Raising Tags	1				Shall open on the last Saturday in July and extend for 30 consecutive days.
<b>(aa) Military Only Tule Elk Hunts</b>					
<b>Hunt</b>	<b>1. Bull Tags</b>	<b>2. Antlerless Tags</b>	<b>3. Either-Sex Tags</b>	<b>4. Spike Tags</b>	<b>5. Season</b>
(1) Fort Hunter Liggett Military Only General Methods					
(A) Early Season	0	0			The early season shall open on the second Monday in August and continue for 5 consecutive days and reopen on the fourth Monday in August and continue for 5 consecutive days.
(B) Period 1		0			Shall open on the first Thursday in November and continue for 9 consecutive days.
(C) Period 2		0			Shall open November 22 and continue for 9 consecutive days.
(D) Period 3	0				Shall open on the third Saturday in December and continue for 16 consecutive days.
(2)(A) Fort Hunter Liggett Military Only General Methods Apprentice	0	0			Shall open on the third Saturday in December and continue for 16 consecutive days.
(3) Fort Hunter Liggett Military Only Archery Only					
(A) Either sex			3		Shall open on the last Wednesday in July and

						continue for 9 consecutive days.
	(B) Antlerless		4			Shall open on the last Wednesday in September and continue for 9 consecutive days.
(4)(A) Fort Hunter Liggett Military Only Muzzleloader Only		4				Shall open on the third Saturday in December and continue for 17 consecutive days.

Amendment filed 7/17/2017; effective 7/17/2017

**§364.1, Title 14, CCR Department Administered Shared Habitat Alliance for Recreational Enhancement (SHARE) Elk Hunts**

- (a) Season: The overall season shall open August 15 through January 31. Individual SHARE properties will be assigned seasons corresponding with management goals.
- (b) Bag and Possession Limit: Each elk tag is valid only for one elk per season and only in the SHARE hunt area drawn, and persons shall only be eligible for one elk tag per season through sections 364 or 364.1.
- (c) Individual property boundaries will be identified in the SHARE application package.
- (d) Method of Take: Only methods for taking elk as defined in Sections 353 and 354 may be used.
- (e) Tagholder Responsibilities: See subsection 364(n)
- (f) The use of dogs to take or attempt to take elk is prohibited.
- (g) Applicants shall apply for a SHARE Access Permit, and pay a nonrefundable application fee as specified in Section 602, through the department's Automated License Data System terminals at any department license agent, department license sales office, or online.
- (h) Upon receipt of winner notification, successful applicants shall submit the appropriate tag fee as specified in Section 702 through any department license sales office or online through the department's Automated License Data System.

<b>(i) Department Administered SHARE Roosevelt Elk Hunts</b>					
<b>Hunt</b>	<b>1. Bull Tags</b>	<b>2. Antlerless Tags</b>	<b>3 Either-Sex Tags</b>	<b>4. Spike Tags</b>	<b>(B) Area</b>
(1)(A) Siskiyou	2	2			Area: The tag shall be valid in the area described in subsection 364(a)(1)(A).
(2)(A) Northwestern	7	20			Area: The tag shall be valid in the area described in subsection 364(a)(2)(A).
(3)(A) Marble Mountain	0	0			Area: The tag shall be valid in the area described in subsection 364(a)(3)(A).

<b>(j) Department Administered General Methods SHARE Rocky Mountain Elk Hunts</b>					
<b>Hunt</b>	<b>1. Bull Tags</b>	<b>2. Antlerless Tags</b>	<b>3 Either-Sex Tags</b>	<b>4. Spike Tags</b>	<b>(B) Area</b>
(1)(A) Northeast California	0	0			Area: The tag shall be valid in the area described in subsection 364(b)(1)(A).
<b>(k) Department Administered SHARE Roosevelt/Tule Elk Hunts</b>					
<b>Hunt</b>	<b>1. Bull Tags</b>	<b>2. Antlerless Tags</b>	<b>3 Either-Sex Tags</b>	<b>4. Spike Tags</b>	<b>(B) Area</b>
(1)(A) Mendocino	2	4			Area: The tag shall be valid in the area described in subsection 364(c)(1)(A).
<b>(l) Department Administered SHARE Tule Elk Hunts</b>					
<b>Hunt</b>	<b>1. Bull Tags</b>	<b>2. Antlerless Tags</b>	<b>3 Either-Sex Tags</b>	<b>4. Spike Tags</b>	<b>(B) Area</b>
(1)(A) Cache Creek	1	1			Area: The tag shall be valid in the area described in subsection 364(d)(1)(A).
(2)(A) La Panza	5	10			Area: The tag shall be valid in the area described in subsection 364(d)(2)(A).
(3)(A) Bishop	0	0			Area: The tag shall be valid in the area described in subsection 364(d)(3)(A).
(4)(A) Independence	0	0			Area: The tag shall be valid in the area described in subsection 364(d)(4)(A).
(5)(A) Lone Pine Period 2	0	0			Area: The tag shall be valid in the area described in subsection 364(d)(5)(A).
(6)(A) Tinemaha	0	0			Area: The tag shall be valid in the area described in subsection 364(d)(6)(A).
(7)(A) West Tinemaha	0	0			Area: The tag shall be valid in the area described in subsection 364(d)(7)(A).
(8)(A) Tinemaha Mountain	0				Area: The tag shall be valid in the area described in subsection 364(d)(8)(A).
(9)(A) Whitney	0	0			Area: The tag shall be valid in the area described in subsection 364(d)(9)(A).

(10)(A) Goodale	0	0			Area: The tag shall be valid in the area described in subsection 364(d)(10)(A).
(11)(A) Grizzly Island	0	0		0	Area: The tag shall be valid in the area described in subsection 364(d)(11)(A).
(12)(A) Fort Hunter Liggett	0	0			Area: The tag shall be valid in the area described in subsection 364(d)(12)(A).
(13)(A) East Park Reservoir	1	1			Area: The tag shall be valid in the area described in subsection 364(d)(13)(A).
(14)(A) San Luis Reservoir	2	3			Area: The tag shall be valid in the area described in subsection 364(d)(14)(A).
(15)(A) Bear Valley	1	1			Area: The tag shall be valid in the area described in subsection 364(d)(15)(A).
(16)(A) Lake Pillsbury	0	0			Area: The tag shall be valid in the area described in subsection 364(d)(16)(A).
(17)(A) Santa Clara	0				Area: The tag shall be valid in the area described in subsection 364(d)(17)(A).
(18)(A) Alameda	0				Area: The tag shall be valid in the area described in subsection 364(d)(18)(A).

*Amended 7/17/2017; effective 7/17/2017.*

**Appendix 6 – 2018 Elk Tags Issued and Harvested on PLM Ranches in the Northwestern Elk Zone**

PLM Name	County	Authorized Harvest	Elk Tags Issued		Harvest	
			Bull	Antlerless	Bull	Antlerless
<b>Alexandre Ecodairy Farms</b>	Del Norte	2 bull elk and 4 antlerless elk	2	4	2	4
<b>Big Lagoon</b>	Humboldt	4 bull elk and 2 antlerless elk	4	2	4	2
<b>Cottrell Ranch</b>	Humboldt	12 deer of which no more than 10 may be antlerless deer, 1 bull elk, and 1 antlerless elk	1	1	1	1
<b>Hunter Ranch</b>	Humboldt	20 deer of which no more than 5 may be antlerless deer and 1 bull elk	1	0	1	0
<b>Klamath PLM</b>	Humboldt	2 bull elk and 2 antlerless elk	2	2	2	1
<b>Redwood House Ranch</b>	Humboldt	20 buck deer forked horn or better and 1 bull elk	1	0	0	0
<b>Smith River</b>	Del Norte	4 bull elk and 6 antlerless elk	4	6	3	5
<b>Stover Ranch</b>	Humboldt	4 bull elk and 2 antlerless elk	4	2	4	1
<b>Wiggins Ranch</b>	Humboldt	2 bull elk and 2 antlerless elk	2	2	2	2
<b>Totals</b>			<b>21</b>	<b>19</b>	<b>19</b>	<b>16</b>

**Appendix 7. Section 555, Title 14, CCR**

**§ 555. Cooperative Elk Hunting Areas.**

To encourage protection and enhancement of elk habitat and provide eligible landowners an opportunity for limited elk hunting on their lands, the department may establish cooperative elk hunting areas and issue license tags to allow the take of elk as specified in Section 364, and subject to the following conditions:

(a) Definition and Scope. A cooperative elk hunting area is an area of private land located within the boundary of an area open to public elk hunting (as identified in Section 364). Minimum size of a cooperative elk hunting area shall be 5,000 acres, except that contiguous parcels of at least 640 acres in size may be combined to comprise a cooperative elk hunting area. Within an area open to public elk hunting, the number of cooperative elk hunting license tags issued shall not exceed 20 percent of the number of public license tags for the corresponding public hunt and shall be of the same designation (i.e., antlerless, spike bull, bull or either-sex) as the public license tags.

(b) Application Process. Application forms are available from the department's headquarters and regional offices. A person (as defined by Fish and Game Code Section 67) owning at least 640 acres within a cooperative elk hunting area shall be eligible to apply for a cooperative elk hunting area permit. Applicants shall designate one individual eligible to receive one elk license tag by the date indicated under subsection (3) below. Such individuals shall be at least 12 years of age and possess a valid California hunting license. A person may annually submit a cooperative elk hunting area application where they own sufficient habitat as described in subsection (a) above, for each public hunt area in which their property occurs.

(1) Applications shall be submitted to the department's regional office nearest the proposed cooperative elk hunting area. Department of Fish and Game regional offices are located as follows:

Northern California and North Coast Region, 601 Locust Street, Redding 96001 (530) 225-2300

Sacramento Valley and Central Sierra Region, 1701 Nimbus Road, Rancho Cordova 95670 (916) 358-2900

Central Coast Region, 7329 Silverado Trail, Box 47, Yountville 94599 (707) 944-5500  
San Joaquin Valley and Southern Sierra Region, 1234 East Shaw Avenue, Fresno 93710 (559) 243-4005

South Coast Region, 4949 View Crest Avenue, San Diego 92123 (858) 467-4201  
Eastern Sierra and Inland Deserts Region, 4775 Bird Farm Road, Chino Hills 91709 (909) 597-9823

(2) Completed applications must be received by the first business day following July 1. Only those applications that are filled out completely will be accepted. The Department will evaluate applications to determine if the specified parcels are of sufficient size within the boundary of a public elk hunt area, and contain important elk habitat. Rejected applications and those that are incomplete will be returned within 15 days of receipt by

the department. If the number of accepted applications exceeds the license tags available, the department will determine successful applicants and a list of alternates by conducting a random drawing from the pool of qualified applicants as soon as possible after the application deadline. For any license year that the demand for cooperative elk hunting license tags within an area open to public hunting (as identified in Section 364) exceeds the number of tags available, tags will be first issued to applicants that did not receive a tag the previous year. If the quota is not filled, tags will be issued to the remaining applicants by random drawing.

(3) Successful applicants will be notified by the department as soon as possible after the application deadline. Applicants shall submit the name, address, and valid California hunting license number of designated elk license tag recipients and payment of elk license tag fees by check, money order, or credit card authorization in the amount specified by subsection 702(b)(1)(L)(M), to the department's regional office nearest the proposed cooperative elk hunting area, by the first business day following August 1.

(c) An elk license tag issued pursuant to the provisions of this section is valid only during the general elk season in which the cooperative elk hunting area occurs and shall only be used on land specified in the landowner's application. License tags are not transferable.

(d) All provisions of the Fish and Game Code and Title 14, CCR, relating to the take of birds and mammals shall be conditions of all license tags issued pursuant to this section.

(e) Any permit issued pursuant to Section 555 may be canceled or suspended at any time by the commission for cause after notice and opportunity to be heard, or without a hearing upon conviction of a violation of this regulation by a court of competent jurisdiction.

Note: Authority cited: Section 1575, Fish and Game Code. Reference: Sections 67 and 1575, Fish and Game Code.

# Comments on the "Draft Supplemental Environmental Document", Elk Hunting, dated Feb. 14, 2019

Phoebe Lenhart

Wed 04/03/2019 01:30 PM

To:FGC <FGC@fgc.ca.gov>;

To whom it may concern:

I appreciate the opportunity to review the "Draft Supplemental Environmental Document", Elk Hunting (DSED), dated Feb. 14, 2019. It is unfortunate that the same ignorance that existed in the original "elk management plan" is perpetuated by the DFW/FGC in this aforementioned "Draft Supplemental Environmental Document" (DSED). See below:

1) "ELK POP". Four years ago I wrote to Joe Hobbs (DFW) and questioned the DFW's use of a 1987 computer model by Smith and Updike (pg. 21). This computer model program is valid for only "2-10 (at the maximum) years". Today, over 30 YEARS LATER, the DFW/FGC continue to generate "fake news" based upon these "fake figures". I think this is appalling and is NOT acceptable. In my opinion, all the "computer model runs" have no credibility, along with the rest of the DSED. Given the above, it appears to me that the DFW/FGC cannot make any legitimate claims about the population of the Roosevelt or set any responsible hunting quotas using this obsolete "computer model". This is the 21st Century, in case the DFW/FGC are not aware of the progress in technology.

I think the DFW/FGC will have much to learn if they would read the reports on the Roosevelt elk researched by the Redwood National and State Parks (RNSP). The RNSP conduct authentic research that is professional.

2) POPULATION OF THE ROOSEVELT ELK IN THE NORTHWEST ZONE. Given the above (#1), the "fake news" and the "fake figures" (based on a computer model that is over 30 years beyond its suggested use), it is obvious to me why I consider the DFW/FGC's DSED fallacious. The DFW/FGC report that there are 1,600 Roosevelt elk (pg. 22), this may be nothing more than a concocted number with no validity.

Again, I refer the DFW/FGC to read the relevant research done by the RNSP.

3)CULLING OF ROOSEVELT ELK BULLS. The DFW/FGC recommends maintaining a ratio of 25 bulls for every 100 cows (pg. 24). The scientific community considers this to be a minimum ratio of bulls for every 100 cows. BUT, the DFW/FGC contradicts their own recommendations and reduces the number of bulls (for 100 cows) to 15 in the Northwest zone!!! The DFW/FGC provides no scientific research behind their decision. I have spoken to reputable biologists who state that a ratio of 15 bulls for every 100 cows is NOT SUSTAINABLE!!! Please provide an explanation to myself and the public for your digression.

Please note, the DFW/FGC does not appear to value the "mature" bulls for their survivorship. Rather than protect the older bulls, with the largest racks, the DFW/FGC condescend to the "trophy hunters". I believe this is contrary to Darwin's theory of natural selection and is another example of poor stewardship by the DFW/FGC.

4) CALF MORTALITY. The DFW/FGC claim that calf mortality is "low" (pg. 19). This is NOT agreed upon by reputable biologists. Their research indicates that Roosevelt elk mortality rates are "high". Refer again to the above (#1).

5) PROJECTIONS. The DFW/FGC present SPECULATION in this DSED (pg. 6) in the form of "alternatives". The DFW/FGC select arbitrary numbers of increases by 10, 20 or 60 tags. It sounds to me that the DFW/FGC are treating the management of the Roosevelt elk as nothing more than a crapshoot. I believe that the hunting allowance is NOT determined by "fake news" and "fake figures", but done by scientifically documented research about what is good stewardship for the herds.

6) PLM AND SHARE HUNTS The additional Roosevelt elk, in particular, the mature bulls, killed in the PLM and SHARE programs indicate a tendency for the killing of bulls to be increasing. These programs are very deceiving since the Roosevelt elk killed are reported on separate tables. I would like more transparency within the DFW/FGC by incorporating the PLM and SHARE hunts on the same tables with the general hunt.

Please explain why, in 2018, there were 15 tags issued to kill bulls, BUT 18 were killed (pg. 18)? Please explain.

7) "THE COMMITTEE" The DFW/FGC does not address the composition of "the committee" in the DSED. As I recall, DFW/FGC gave 2 positions to the Rocky Mountain Elk Foundation and no positions were assigned to any conservation groups. I think this is not fair and is biased. I would like one of the Rocky Mountain Elk Foundation's seats to be assigned to a conservation group.

8) BIBLIOGRAPHY Four years ago I wrote to Joe Hobbs (DFW) and shared with him my observation that the bibliography for the "Draft Environmental Document", dated Dec. 8, 2015 was lacking current scientific research and was very obsolete. In comparison, the DSED (dated Feb. 14, 2019) continues to present the same deficiencies and a lack for current research. In particular, there is an obvious omission of the reputable research done by the RNSP. I insist that this change as the RNSP has so much to offer to DFW/FGC about their research done on the Roosevelt elk.

The Supporters for Del Norte Roosevelt Elk have been working with the DFW/FGC for over 4 years on behalf of the Roosevelt elk in Del Norte County. I have provided both agencies with relevant suggestions based on scientists' research pertaining to the good stewardship of the Roosevelt elk. Hundreds of thousands of Roosevelt elk were slaughtered by hunters to near extinction around 100 years ago. I am insulted by the DFW/FGC's DSED and suggest that it be re-done without the "fake news" and "fake figures".

Sincerely,

Phoebe Lenhart

Supporters for Del Norte Roosevelt Elk



# Friends of Del Norte

## *Conserving our Natural Heritage Since 1973*

*Protecting the Wildlands, Waters and Wildlife  
Of the Del Norte County Region*

P.O. Box 144, Crescent City, CA 95531 707 954-1969 or 707 465-8904

April 4, 2019

*Transmitted by email on this date to the California Department of Fish & Wildlife  
Via staff addresses below:*

[Victoria.Barr@wildlife.ca.gov](mailto:Victoria.Barr@wildlife.ca.gov); [fgc@fgc.ca.gov](mailto:fgc@fgc.ca.gov)

***California Fish and Game Commission***

***Valerie Termini, Executive Director***

P.O. Box 944209

Sacramento, CA 94244-2090

Dear Commissioners and Staff:

We are submitting this today to meet the deadline for inclusion in the packet for Fish & Game Commissioners for their April meeting. Thank you as always for the opportunity to participate in this process. These comments focus on the North Coast Roosevelt Elk Management Unit, (also referred to as Northwestern California Hunt Zone). The “Document” referenced throughout these comments is the Draft Supplemental Environmental Document ELK HUNTING prepared by California Department of Fish & Wildlife (CDFW) and dated February 14, 2019.

### **Summary**

We appreciate that CDFW integrated their presentation to discuss the combined impacts of all hunt categories (PLM, SHARE, General), in response to our scoping comments. This makes the process more transparent and less fragmented. However, you have a legal obligation to address our other scoping comments, which CDFW fails to do. (Our

scoping comments follow in Appendix B.)

Unfortunately the CDFW Document is outdated and contains critical misrepresentations, errors, and incomplete analysis. Historical and relevant harvest numbers that we have been provided by the California Department of Fish & Wildlife upon request, as well as important and relevant 2017—2019 elk count numbers and longer-term studies that are available from Redwood National & State Parks should be made part of the record and presented to the public and to the Commissioners with a review period to allow informed decisions. The Parks are in the heart of the Northwestern Hunt Zone, but their data is ignored. We have made this comment many times before. (See Attachments and Appendices.) The Elk Pop computer model scenarios should be re-calculated to correct errors and misrepresentations, which will change the results and cause the entire document to be re-issued. Otherwise CDFW is vulnerable to legal challenge.

CDFW's failure to provide historic data and paint the "big picture" for the public means that this Document is fragmenting and obscuring the CEQA process, again leaving the public and the Commissioners without the necessary tools for judgement.

We are aware that the general public in Del Norte is excited about the return of the Roosevelt elk. Yet the comments that we and other regional non-profit organizations have made repeatedly, since 2015, regarding these elk hunts and the Statewide Management Plan are for the most part ignored in CDFW final documents. CDFW has a legal obligation to address all comments, and the Commissioners, based on their new mission statement, want to see a fully transparent and accessible process allowing meaningful public participation. Instead this Document emphasizes only and repeatedly the **conflicts** with elk. It suggests to us that commercial interests have the ear of CDFW, which does not give proportional voice to non-profit groups that represent memberships of the public.

Moreover the CDFW strategy appears concerned *only* with *shooting* elk, even now signaling their intent to make greater use of depredation permits. We have previously suggested alternative solutions to "conflicts" which CDFW has ignored, such as: providing financial assistance for elk fencing, shown to be effective for small ranches; conservation easements on larger ranches to support elk corridors to allow movement between coastal and upland environments, and elk overcrossings and undercrossings.

The CDFW strategy violates the Statewide Elk Management Plan, which recommends making public lands more attractive to elk as an alternative; in Del Norte County 80+% of the land is public trust land and in concept available for elk.

We note that today April 4<sup>th</sup> the California Wildlife Conservation Board has announced that the “ [Wildlife Corridor and Fish Passage solicitation](#) under Proposition 68 is now available. Priorities include construction of wildlife overcrossings and undercrossings, restoration of natural habitats that provide a visual screen in wildlife corridors...”

Our organization finds that it cannot support any of the project alternatives, because of the errors in the analysis. Even if we wanted to support the “current conditions/no project” alternative, we could not because it is not clear what number this would be, 65 or 80, and it is not clear what impacts this is already having or will have in future. We would like to see further growth in the herds (so that the Roosevelt elk herds re-occupy all of their historic range) based on actual counts or based on a clear, detailed explanation of what the actual counts are; how they are collected, and how population numbers are derived from actual counts. There is no alternative in the Document that allows this.

### 1) Errors, Inconsistencies and Misrepresentations in Document

A summary of all past elk harvest for the Northwest hunt provided by CDFW is contained in our Appendix A, except that 2018 harvest numbers are given on page 18 of the Document (as total 2018 harvested hunt, PLM, SHARE, General, was: bulls: 45 + antlerless 35 = 80.) As clearly stated on page 6 of the Document, *the baseline or current condition is 2018/2019 for the no project alternative*, which is the harvest of about 80. Yet the Elk pop model run for the no project alternative uses only 65 elk.

The historic progression of the harvest is summarized:

2013- total harvest 45  
2014- total harvest 45  
2015- total harvest 68  
2016- total harvest 62  
2017- total harvest 73, and 85 tags were issued  
2018- total harvest 80, and 88 tags were issued

The Document also fails to provide or analyze the historic information. If it did, we would see that **from 2014 to 2018 CFG allowed the elk harvest to increase by 77%** [(80-45)/45] . Yet during this same time period when the elk harvest nearly doubled, there were no environmental documents; no actual field elk counts until 2017, and no transparent, coherent historic analysis whatsoever – were ever provided to the public.

Elk population **models** in the Document on pages 58 and 59 show current conditions and the no project alternative, as a **harvest of only 65 elk**:

“Appendix 3. Computer Model Runs (Elk Pop) Harvest NORTHWESTERN CALIF. ELK HERD SIMULATION- GENERAL, PLM, SHARE TAGS, 2019 (Combined Harvest for Del Norte and Humboldt cos) Ratio = 37/100/32 - Maximum Calf Survival = 40% THIS PROGRAM CALCULATES CHANGES IN HERD CHARACTERISTICS BASED ON VARIOUS HARVEST RATES. CURRENT CONDITIONS = NO CHANGE. GENERAL, COOP ELK, SHARE AND PLM TAGS TO HARVEST APPROXIMATELY 44 BULLS AND 21 ANTLERLESS ELK”

However, the actual current baseline conditions are that for the last two years, there has been a hunt that issues greater than 80 tags and results in a harvest that approaches 80. *Not 65*. There has been a misrepresentation of current baseline conditions in the population modeling documents. This is internally inconsistent, and is confusing as to how the model was manipulated. The Document contains a serious error.

Likewise, the proposed alternative is misrepresented:

In the population model, page 62, the proposed harvest is stated as approximately 85: “PROPOSED PROJECT: ADD 8 BULL AND 12 ANTLERLESS (SHARE) TAGS TO **HARVEST APPROXIMATELY 52 BULLS AND 33 ANTLERLESS ELK**”

The total proposed harvest, as stated on page 18:

*The proposed project will result in increasing the total tags to allow removal of up to 108 Roosevelt elk.*

The proposed harvest of 108 is significantly larger than the proposed project **model** run of 85.

What is alarming is that the models run clearly show that if you run the actual current conditions of a harvest of approximately 80-85, the herds do not grow significantly, but remain stable.

The Department of Fish and Wildlife has significantly and incrementally increased elk harvest size since 2014 by 77%, so that the significantly increased harvest belatedly described in this Document – **has already been implemented**. Already implemented – we would underline again – **without** appropriate elk count/population data analysis and without environmental documents. The harvest numbers have increased substantially *every single year* since 2014, without environmental documents and through 2017

without a Statewide Management Plan. Current baseline conditions of harvesting 80-85 elk already constitute implementation of a greatly increased harvest. The models show that this amount of harvest, page 62, will result in stable or possibly a slight decrease in herd size. Any harvest above this amount is shown to decrease herd size significantly.

Therefore our organization finds that it cannot support any of the project alternatives, because of the errors in the analysis. Even if we wanted to support the “current conditions/no project” alternative, we could not because it is not clear what number this would be, 65 or 80, and it is not clear what impacts this is already having or will have in the future. We would like to see further growth in the herds (so that the Roosevelt elk herds re-occupy most of their historic range) based on actual counts or based on a clear, detailed explanation of what the actual counts are; how they are collected, and how population numbers are derived from actual counts. There is no alternative in the Document that allows this. CDFW has failed to provide an alternative which would *decrease* the number of tags issued and elk harvested.

The Elk pop model run shows a decrease in the recovering Roosevelt elk herds which is in conflict with the goals of the Statewide Management Plan. This is also in conflict with the desires of the general public.

## **2) How Many Elk are Out There??**

The Document fails to document in any way the alleged conflicts between landowners and elk, which are most likely being “reported” to CDFW by larger commercial operations. Document tone is negative about the elk “problem” and repeatedly uses the word “conflict.” It is silent on the widespread public interest in the recovery of the elk herds. Nor does it mention the contribution to tourism, on which our regional economies are now heavily dependent. Unfortunately overall the enthusiastic general public is not aware of the CDFW/CFG elk hunt process.

However as some indication of fervid public interest in elk recovery, we offer the following: Redwood Parks Conservancy and Tolowa Dunes Stewards (two non-profit organizations providing support to state and federal agencies) have on August 13, 2017 and August 26, 2018 hosted open public presentations in Del Norte County about the Roosevelt elk monitoring programs being conducted by Humboldt State University (HSU) and CDFW. As Del Norte County has fewer than 30,000 residents, these Sunday afternoon programs were very well-attended, with 38 and 51 people, respectively. (Susan Calla, personal communication) It was obvious that all attendees felt positive

about the elk. These attendees sat in uncomfortable metal chairs in a small, unventilated room, totally fascinated as team members presented a broad range of detail and data. There was some natural history of elk but primarily the focus was on all the different data collection methods being employed by the team. Presentation and questions continued for 2-3 hours. Some photos, recordings, and notes were taken. (Sandra Jerabek, personal communication) The public soaked up a wealth of information and explanation, which is now in sharp contrast to the sparse explanations of data and leaps of faith in this Document.

**As part of the above referenced public presentations:**

**On August 13, 2017** Carrington Hilson of CDFW said there were 300 elk in Del Norte in fall of 2016, and further that up through this point in time the data was more or less “anecdotal.” A more scientific approach had been launched in 2017 by CDFW and Humboldt State University Department of Wildlife. According to Hilson, the population increased to 400 or 440 in Del Norte and to 990 for the Northwestern zone in 2017. In Hilson’s presentation on **August 26, 2018**, she said that there were “nearly 1,000 in the zone,” and between “400-500 in each county.” *But she also stated in the 2018 presentation that: “between 113 and 429 is the actual count in the Northwest Hunt Zone.”* This implies that the team (including HSU professors and students) *might* be using their own projection model to arrive at their population numbers of 990 or 1,000. Hilson stated many times that it was challenging to count elk with all of the forest cover.

As counting elk might be challenging, in the 2018 public presentation HSU Professor Micaela Szykman Gunther also explained in detailed slides a mathematical formula that the HSU team had developed to project elk population/abundance estimates from field data, in this case from their collection of fecal DNA.

The Document on page 22 states “direct counts within a portion of the zone from 2016 to 2017 resulted in a minimum count of 990 elk in 22 distinct groups (CDFW 2018).” (This number 990 is the same number Hilson gave as total elk numbers at the public presentation in 2017, without any qualification as to it being the minimum count or covering only a portion of the zone.) From here the Document on page 22 goes on to state: “...using the minimum count of 990 from only a portion of the entire zone, conservatively assumes the current population size is 1,600 elk and carrying capacity is estimated at 1,760 elk across the entire zone.” There is no explanation whatsoever of how the Document takes this leap from a population of 990 elk to 1,600 elk. No formula or or explanation of any accepted method is offered here.

The discussion of actual elk population data on page 22 of the Document is deficient. There is no explanation of what “portions” of the zone they are referencing. Hilson’s numbers of 990 in 2017 and then nearly 1,000 in 2018 were not qualified as partial in the public presentations, and do not suggest that as stated in the Document on page 22 “elk populations are growing and expanding within the unit” to any appreciable extent. In fact, the brief *two* year period of time that CDFW has been surveying northwest elk is not long enough to establish a trend.

The Document also fails to give even the 2018 or early 2019 elk field counts, thus it is outdated and incomplete. Also, by failing to provide the most recent data CDFW is fragmenting the CEQA process, leaving us wondering when that data will be presented, considered and factored in. Further where is the explanation of how field data is collected? Where is the detailed explanation of how final population numbers are derived from field counts? Certainly this is *not* in this Document either. We are left to speculate. We are left to take it on faith.

Is CDFW using their own internal method to project population from field counts? Are they using the mathematical formula that HSU Professors have developed? Have these methods been published and peer reviewed? Or perhaps, in the worst possible case scenario, are field counts being projected from actual data twice, once by the HSU/CDFW team and once again by CDFW in preparing the Document? Reading the Document there is no way of knowing.

CDFW then uses 1,600 as the supposedly real population number in the Elk pop computer scenarios. Given these Roosevelt elk herds are recovering (from being nearly extirpated) and have unique genetics, perhaps the conservative number of 990 should be used to run the scenarios (after clarifying how *that* number was obtained). CDFW is obligated to explain more precisely how they got the number of 990 elk, as well as to explain the 62% leap from 990 to 1600 elk. The elk-loving public deserves this.

Frankly we had expected CDFW to incorporate and explain to the public the connection between the field data that CDFW and HSU team is collecting and CDFW actions in already allowing such large increases in elk hunting from 2013 to 2018. Failure to do so leaves a significant gap in the information that CEQA is supposed to provide.

### **3) Redwood National & State Parks studies do not support CDFW leap of faith in elk population growth projections**

In reference to the attached **Redwood National & State Parks, 2017 HERD UNIT CLASSIFICATION AND MANAGEMENT OF ROOSEVELT ELK:**

Redwood National & State Parks has been surveying park elk since 1997, and the results are shown in figure 1, page 5.

This chart shows that since 1997, the population for these studied herds is stable or declining. (The OSOC herd appears to spike only because during 2015 the LRRC herd discontinued and was absorbed by OSOC.) The chart shows EPBY and GOBB herds to be in decline. The DARA herd has only slightly increased. Overall, the Redwood National Park elk do not exhibit growth, but rather show a decline of cows during this long study period. Most of these herds do not have hunting pressure, and yet they have declined. Also, figure 2, page 7 of the report shows bull to cow ratios for the EPBY and DARA herds have decreased significantly from 2008 to 2017. This indicates that herds that have declining cow populations also have proportionally greater declines of bulls. Appendix A in the Redwood Parks study is the last page, with useful population data.

In addition to misrepresenting the harvest size of the proposed project within the CDFW Document models, these models use an exaggerated population base of 1,600, rather than the actual population results of the CDFW survey data, which *may* be approximately 1,000 for Del Norte and Humboldt zone herds combined. Considering that the Humboldt County Redwood National & State Parks elk surveys/management studies have been conducted over a longer period of time to assess population trends, and show an overall decline in elk population, the inflated population base of 1,600 is doubtful. How can it be “conservative”?

### **4) Failure to respond to all scoping comments: Tribal hunt allocations**

We have requested in our scoping comments and in comments on the draft Management Plan that Tribal hunting allocations be given the first priority, with free or discounted tags for Tribal members because this is subsistence food, and that Tribal hunts be coordinated with other hunts to ensure that a particular herd is not overly impacted. These comments have never been addressed by CDFW or the Commission.

**5) Failure to respond to all scoping comments: Unique Genetics of these Herds**

The discussion of genetics in the Document on page 23 is too general to be of value. The documents talk about impacts to the statewide gene pool but not to the genetically pure or unique “Redwood elk” as per EPIC’s previous submitted comments and attachments on elk hunts and Management Plan. Attached once again are the genetic studies suggesting that the elk that are hunted in this zone are important because they may be genetically unique. Again they deserve a truly conservative approach, special management and further study. These comments have never been addressed by CDFW or the Commission.

Thank you, Commissioners for your new mission statement; your dedication to transparency and public participation, and your careful attention to this process.

Sincerely,

*Joe Gillespie*

Joe Gillespie  
President  
Friends of Del Norte

**Attachments:**

- Redwood National & State Parks, 2017 Herd Unit Classification and Management of Roosevelt Elk (RNSP 2017)
- Elk genetics studies: Meredith; Polziehn.

## Appendix A: Details of Elk Harvest 2013-2014

----- Forwarded Message -----

**From:** "Hilson, Carrington@Wildlife" <Carrington.Hilson@wildlife.ca.gov>

**To:** "upsprout@yahoo.com" <upsprout@yahoo.com>

**Cc:** "Fresz, Shawn@Wildlife" <Shawn.Fresz@wildlife.ca.gov>; "Barr, Victoria@Wildlife" <Victoria.Barr@wildlife.ca.gov>

**Sent:** Wednesday, December 5, 2018 4:17 PM

**Subject:** Elk Tags Allocated in Del Norte and Humboldt Counties

Ms. Cooper,

Per your request that you made during our conversation last Thursday, I have compiled the number of allocated elk tags and reported harvest for all PLM, SHARE, and general hunts in Del Norte and Humboldt counties from 2013 to 2017.

Year	Hunt Code	Hunt Name	Gender	Tags Allocated	Harvest
2013	402	Big Lagoon antlerless	either-sex	5	1
2013	403	Big Lagoon bull	bull	5	3
2013	404	Klamath antlerless	antlerless	5	0
2013	405	Klamath bull	bull	5	3
2013	413	Del Norte antlerless	antlerless	10	8
2013	414	Del Norte bull	bull	5	5
2013	483	Northwestern California	either-sex	20	19
2013	PLM	Cottrell Ranch	bull	1	1
2013	PLM	Fulton Ranch	bull	1	0
2013	PLM	Hunter Ranch	bull	1	0
2013	PLM	Redwood House Ranch	bull	1	1
2013	PLM	Stover Ranch	bull	4	4
2013	PLM	Stover Ranch	antlerless	2	1
2013	PLM	Wiggins Ranch	bull	2	2
2013	PLM	Wiggins Ranch	antlerless	2	0
2014	403	Big Lagoon bull	bull	5	5
2014	405	Klamath bull	bull	5	1
2014	483	Northwestern California	either-sex	30	25
2014	PLM	Cottrell Ranch	bull	1	0
2014	PLM	Cottrell Ranch	antlerless	1	1
2014	PLM	Fulton Ranch	bull	1	1
2014	PLM	Hunter Ranch	bull	1	1
2014	PLM	Redwood House Ranch	bull	1	1
2014	PLM	Smith River	bull	3	3
2014	PLM	Stover Ranch	bull	4	2
2014	PLM	Stover Ranch	antlerless	2	1
2014	PLM	Wiggins Ranch	bull	2	2
2014	PLM	Wiggins Ranch	antlerless	2	2
2015	483	Northwestern California	either-sex	45	35
2015	PLM	Alexandre Eco Dairy Farms	bull	2	2
2015	PLM	Alexandre Eco Dairy Farms	antlerless	4	4
2015	PLM	Big Lagoon	bull	3	2

2015	PLM	Cottrell Ranch	bull	1	1
2015	PLM	Cottrell Ranch	antlerless	1	1
2015	PLM	Fulton Ranch	bull	1	1
2015	PLM	Hunter Ranch	bull	1	1
2015	PLM	Klamath	bull	2	2
2015	PLM	Redwood House Ranch	bull	1	1
2015	PLM	Smith River	bull	3	3
2015	PLM	Smith River	antlerless	6	6
2015	PLM	Stover Ranch	bull	4	4
2015	PLM	Stover Ranch	antlerless	2	1
2015	PLM	Wiggins Ranch	bull	2	2
2015	PLM	Wiggins Ranch	antlerless	2	2
2016	355	Northwestern California bull	bull	15	12
2016	PLM	Alexandre Ecodairy Farms	antlerless	4	4
2016	PLM	Alexandre Ecodairy Farms	bull	2	2
2016	PLM	Big Lagoon PLM	antlerless	2	2
2016	PLM	Big Lagoon PLM	bull	3	3
2016	PLM	Cottrell Ranch	antlerless	1	0
2016	PLM	Cottrell Ranch	bull	1	1
2016	PLM	Fulton Ranch	bull	1	1
2016	PLM	Hunter Ranch	bull	1	1
2016	PLM	Klamath PLM	antlerless	2	2
2016	PLM	Klamath PLM	bull	3	2
2016	PLM	Redwood House Ranch	bull	1	1
2016	PLM	Smith River PLM	antlerless	6	6
2016	PLM	Smith River PLM	bull	3	3
2016	PLM	Stover	antlerless	2	2
2016	PLM	Stover	bull	4	3
2016	PLM	Wiggins Ranch	antlerless	2	1
2016	PLM	Wiggins Ranch	bull	2	2
2016	SHARE	Copher Ranch	antlerless	1	1
2016	SHARE	Copher Ranch	bull	1	1
2016	SHARE	Del Norte North	antlerless	6	5
2016	SHARE	Del Norte North	bull	3	3
2016	SHARE	Del Norte South	antlerless	6	2
2016	SHARE	Del Norte South	bull	3	2
2017	355	Northwestern California bull	bull	15	15
2017	483	Northwestern California either-sex	either-sex	3	2
2017	PLM	Alexandre Ecodairy Farms	antlerless	4	4
2017	PLM	Alexandre Ecodairy Farms	bull	2	2
2017	PLM	Big Lagoon PLM	antlerless	2	0
2017	PLM	Big Lagoon PLM	bull	3	3
2017	PLM	Cottrell Ranch	antlerless	1	1
2017	PLM	Cottrell Ranch	bull	1	1
2017	PLM	Fulton Ranch	bull	1	0
2017	PLM	Hunter Ranch	bull	1	1
2017	PLM	Klamath PLM	antlerless	2	1
2017	PLM	Klamath PLM	bull	3	2
2017	PLM	Redwood House Ranch	bull	1	1
2017	PLM	Smith River PLM	antlerless	6	6
2017	PLM	Smith River PLM	bull	3	3
2017	PLM	Stover	antlerless	2	1
2017	PLM	Stover	bull	4	4
2017	PLM	Wiggins Ranch	antlerless	2	1

2017	PLM	Wiggins Ranch	bull	2	2
2017	SHARE	Copher Ranch	antlerless	2	1
2017	SHARE	Copher Ranch	bull	1	1
2017	SHARE	Del Norte North	antlerless	11	10
2017	SHARE	Del Norte North	bull	1	1
2017	SHARE	Del Norte South	antlerless	7	7
2017	SHARE	Del Norte South	bull	5	3

Please let me know if you have any questions regarding this information.

**Carrington Hilson**

Environmental Scientist  
 California Department of Fish and Wildlife  
 Email: carrington.hilson@wildlife.ca.gov  
 Cell: 707-502-4078

**Appendix B: Friends of Del Norte Scoping Comments**

*This is an exact copy of what we submitted in November, except for the footer and page numbers:*

November 30, 2018

*Transmitted by email on this date to the staff addresses below:*

[Victoria.Barr@wildlife.ca.gov](mailto:Victoria.Barr@wildlife.ca.gov); [Joe.Hobbs@wildlife.ca.gov](mailto:Joe.Hobbs@wildlife.ca.gov); [fgc@fgc.ca.gov](mailto:fgc@fgc.ca.gov)

**California Fish and Game Commission**

**Valerie Termini, Executive Director**

P.O. Box 944209  
 Sacramento, CA 94244-2090

Dear Commissioners and Staff:

**RE: Scoping Comments for environmental documents and proposed tag quota increase in the Northwestern Elk Zone of 20 tags, as per Victoria Barr communication on November 19, 2018 -- 4 pages.**

Thank you for the opportunity to participate in this process. The Friends of Del Norte will focus the scope of these comments on the North Coast Roosevelt Elk Management Unit, (also referred to as Northwestern California Hunt Zone).

First we make three general requests right up front, and then we bullet all the information that we believe you will be obliged to include in any forthcoming environmental documents.

**\*First, we suggest again that Tribal hunting should be the first and highest priority for existing hunting tags.** In other words the allocations for Tolowa Dee-ni' Nation, Elk Valley Rancheria, and the Yurok Tribe should be established *before* the PLM, SHARE and general hunt allocations are set. Tags for Tribal members should also be free of cost or at least affordable according to a standard determined by the Tribal governments, as the PLM tags are not affordable and 2017 tag increases were primarily in the SHARE program. If Tribes have a “share” in the SHARE program, this is not transparent.

Tribal hunting should be coordinated overall, in a transparent manner, with other CDFW sanctioned hunting so that individual herds are not overly impacted, but in any case Tribal members should have priority and affordable opportunity to hunt elk.

**\*Second, please separate the Del Norte hunt from the Humboldt hunts.**

By combining the hunts of Humboldt County (primarily affecting the herds that take refuge in Redwood National Park and/or State Parks) and Del Norte County, there is the false impression that hunting stress is not harmful overall. However, hunting is not allowed in the Redwood Parks, where the elk populations are large. Therefore the small herds of Del Norte are taking the majority of stress from hunting. This is obscured by combining the two counties. Also consider that Del Norte herds have already experienced a significant increase in hunting since 2013, when there were no Smith River PLM or Alexandre PLM and no SHARE hunts. This has increased to currently in 2017 to 9 Smith River PLM, 6 Alexandre PLM, plus 12 SHARE hunts (Pers. Communication, Carrington Hilson, CA Dept. of Fish and Wildlife, 2018 Nov. 29). This additional hunting pressure represents an increase of 27 elk specifically taken from Del Norte, and a very rapid increase from zero to 27 within only five years. Adding these new PLM and SHARE hunts to the general hunt pressure, and the results of increases far exceeds any growth of the Del Norte herds proportionally.

**\*Third, of great biological importance also is that based on existing science the Roosevelt elk in the Northwest CA Hunt Zone are genetically pure or unique** (see previous comments from Friends of Del Norte, EPIC). Please consider this factor.

**\*Fourth, on behalf of the concerned public, we would greatly appreciate the transparency if the environmental documents would also address the following:**

- Present in detail, all elk population data collected to date and used as a basis for any proposed increase in hunting tags.
- Present all data showing how many elk are actually killed each year in each program including PLM and SHARE, Tribal hunts, and including poached elk (e.g. recent 2018 poaching in Redwood National & State Parks; 2018 apprehended poachers in Gilbert Creek area) and road kill. Please show respective locations on a map, or at least break out by County and general areas within counties.

We request improved transparency throughout the process. Proposed numbers of tags and categories for all hunts: General, SHARE, PLM, Apprentice, Tribal, etc. should be easily accessible such that a given agency, region or county can grasp and analyze the impacts to their region, county or neighborhood. These proposed quotas should be locally published well before the Commissioners' meeting dates so communities have a greater opportunity to voice their support or concerns.

- Indicate which elk population data are based on actual field counts, surveys and other methods involving actual sighting or handling of the elk by authorized personnel -- and which population data are projected from field data by mathematical formulas and other methods in use by the Humboldt State University (HSU) /CDFW team (and/or other experts consulted by this team).
- Explain clearly which of these methods for projecting elk population numbers are being used; where else and by whom these methods are in use, and to what extent these projection methods have been published and peer-reviewed.
- Note if any portion of the population counts/data is based directly on reports/counts from the public (or local businesses or ranches etc.).
- Chart the progression or changes in estimated elk population numbers and/or data-based population numbers over the last 10 years, and over the last 150 years.
- Explain how proposed hunting tag increases will fulfill the existing or draft Elk

Management Plan population goals for this region.

- Discuss how elk are significantly impacted by recent fires in surrounding areas of Southern Oregon and Northern California, and how this combined with any proposed increased hunting pressure impacts the elk in the Northwestern CA Hunt Zone.

We should compensate by allowing elk to increase their numbers and find refuge in nearby areas such as ours, to compensate for losses in elk or elk habitat.

- Explain all reason(s) including biological justification for the proposed increase in elk tags when the HSU/CDFW data gathering and studies are not complete, have not been published, released, or peer-reviewed.

CDFW is proposing for the 2018 Elk Tag Allocation adjustments within the quota ranges allowed under the old outdated elk management plan, a plan not supported by scientific evidence.

- Show how the proposed increase in tags is spread over the categories of General Hunt; PLM; SHARE, and the allocation for Tribal Hunts/Tags. Please show respective locations on a map, or at least break out by County and general areas within counties.

We also attach our previously submitted comments on the draft elk management plan for your convenient reference, as these comments continue to be relevant to your process.

Again Friends of Del Norte thank staff and the Fish and Game Commission for the opportunity to comment.

Sincerely,

*Joe Gillespie*

Joe Gillespie  
President  
Friends of Del Norte



## **2017 HERD UNIT CLASSIFICATION AND MANAGEMENT OF ROOSEVELT ELK**



*Photo: Redwood National and State Parks*

June 2018

## INTRODUCTION

The Roosevelt elk (*Cervus elaphus roosevelti*), the largest of the six recognized North American elk subspecies, once occurred from southern British Columbia to Sonoma County, California. With the arrival of European and other foreign settlers intense hunting began in the mid-1800s and the Roosevelt elk's range was greatly reduced. From 1848 through 1855, market hunting for elk hide and meat supplied gold miners during the northern California gold rush. When the gold rush was over a large amount of elk habitat was converted to cattle and sheep ranching and croplands, and elk were killed to protect against crop depredation. Elk populations and distribution in the Marble and Siskiyou Mountains and the Salmon-Trinity Alps were significantly reduced (USDI 1983). The only Roosevelt elk populations that persisted through this period were those occupying coastal lowlands in northern California, where dense forests and brush fields provided protective cover. Today Roosevelt elk in California persist only in Humboldt and Del Norte Counties, and extreme western Siskiyou County.

Prior to foreign settlers' arrival, local tribes (Yurok, Chilula, and Hupa) living in and around what is now Redwood National and State Parks (RNSP or "parks") burned prairies, grasslands, and forest openings to promote new growth of plants attractive to elk as forage. Tribal use of elk for subsistence presumably had little impact on elk populations in comparison to population declines following settlement.

The Redwood National Park *Elk Management Report* (Hofstra *et al.* 1986) stated the long term goal for elk within Redwood National and State Parks is "...an elk population in equilibrium with the environment, regulated by vegetation dynamics, predation, competition with other species, and other natural forces." It goes on to acknowledge that achieving this goal may be "problematic at Redwood, given its configuration, relatively small size, land use history, adjacent activities, and habitat needs of elk."

### *Work in RNSP*

Annual classification of elk herds within RNSP began in 1996 to document relative abundance and simple population characteristics such as cow numbers, recruitment, and calf survival within known herds (Wallen 1997). These herd count/classifications have been conducted annually each fall since that time by parks staff and others. Also in 1996, a monitoring program of the elk population in the Prairie Creek drainage was established independent of the RNSP program (Weckerly 1996, Weckerly *et al.* 2004). The 2 independent monitoring programs in the same area provided a unique opportunity to compare data gathered without using a standardized protocol with data gathered using a more rigorous approach using a standardized protocol associated with hypothesis testing.

Beginning in 2004, Dr. Floyd (Butch) Weckerly counted elk in the Bald Hills using a method he developed (Weckerly and Francis 2004). The Prairie Creek herd counts tended to yield similar results using the parks' and Weckerly's survey methods. However, the Bald Hills herd counts tended to be quite dissimilar between park staff and Weckerly, with staff counts consistently undercounting the number of animals. Because of this, staff counts were discontinued in the Bald Hills.

## METHODS

Seven separate herds were originally counted/classified within RNSP. In 2015, 2 herds coalesced and have remained so through January 2018, resulting in 6 herds now being counted within RNSP. Five of these herds are counted by park staff from September through November, the fall herd classification period. The Bald Hills herd was counted 10 times in January by Dr. Weckerly. Surveys by Dr. Weckerly associated with Prairie Creek herd monitoring also were conducted in January 2018. Results from these latter 2 surveys are considered part of the 2017 elk count period and are included in this report with the fall 2017 information. This is compatible with how survey results have been reported in previous reports. The 6 herd units are:

- (1) **Old South Operations Center (OSOC)** herd (combined with the former **Lower Redwood Creek (LRCR)** herd)
- (2) **Davison Ranch (DARA)** herd
- (3) **Elk Prairie/Hwy 101 Bypass** herd (EPBY)
- (4) **Gold Bluffs Beach (GOBB)** herd
- (5) **Crescent Beach Education Center (CBEC)** herd
- (6) **Bald Hills (BAHI)** herd

Detailed descriptions of the locations of herd units appear under Herd Summaries on page 7.

Classification counts were conducted by park staff either driving or hiking to the herd units, and using binoculars and spotting scopes to count elk. Staff recorded the total number of elk observed, and the total number of elk within each classification group. The classification groups are mature bulls, spikes (first year males identified by a lack of brow tine off the main beam), cows, and calves. The observers assigned ranking criteria to the classification counts that specified the accuracy of the count, using a scale of 1 to 4. A rating of 1 indicated good visibility with the animals close enough to accurately count and classify the herd. A rating of 4 indicated that the observation was unacceptable for determining herd composition because of poor visibility due to low light level, fog, vegetation, or topography. The highest cow count with a favorable ranking was used as the herd size estimate and for calculating calf:cow and bull:cow ratios.

### *Fall Count Herd Classification Groups*

- **Cows** = all females >1 year old.
- **Calves** = young of the year <1 year old (recognized by spotted coat and small size; later the spots disappear, but calves retain a short, rounded snout).
- **Spikes** = year-old males exhibiting only a main beam, brow tine/antler branching absent.
- **Mature bulls** = males  $\geq 2$  years, with brow tine evident off the main beam.

### *Fall Count Herd Observation Ranking Criteria*

**1 = Good**, visibility good and animals close enough to observe with high confidence of an accurate count and classification.

- 2 = Fair**, animals are either distant or another factor made the observer less than fully confident in classification (e.g. some vegetation blocking full view or movement into cover while counting).
- 3 = Poor**, animals too far away (e.g. difficult to track individuals or animals are in adjacent hiding cover).
- 4 = Unacceptable**, bad visibility due to low light levels, fog, or other factors.

During January surveys, elk in the Bald Hills were counted from vantage points accessible by vehicle or approached on foot. A set route was driven/walked on 10 different days. Observers approaching elk groups on foot did so to obtain an unobstructed view or to conduct a coordinated stalk. A coordinated stalk consisted of an attempt by a first surveyor to alert an elk group to his or her presence so that the group moved in such a manner that they could be counted by a second surveyor. All animals within 50 m (~165 ft) of one another displaying coordinated activity or movement were considered a group (Weckerly *et al.* 2004). The highest cow count with a favorable ranking was used as the herd size estimate and for calculating calf:cow and bull:cow ratios.

## RESULTS AND DISCUSSION

Fall classification counts and the winter 2018 classification count for the BAH1 herd are presented in Table 1. It should be noted that the parks' DARA and EPBY herds are combined in Weckerly's "Prairie Creek" herd. Table 1 numbers for DARA and EPBY reflect fall staff counts.

**Table 1. Highest number of elk reported within each herd unit and for each fall classification grouping in 2017. MB = mature bull, SP = spike, CW = cow, CV = calf, n = total fall counts when animals were observed.**

<b>Herd</b>	<b>MB</b>	<b>SP</b>	<b>CW</b>	<b>CV</b>	<b>Total</b>	<b>n</b>
OSOC	6	10	35	10	61	3
BAH1 <sup>1</sup>	2	17	153	27	199	10
DARA	4	6	45	14	69	3
CBEC <sup>2</sup>	N/A	N/A	N/A	N/A	59	2
GOBB	1	0	14	7	22	4
EPBY	2	0	2	1	5	3

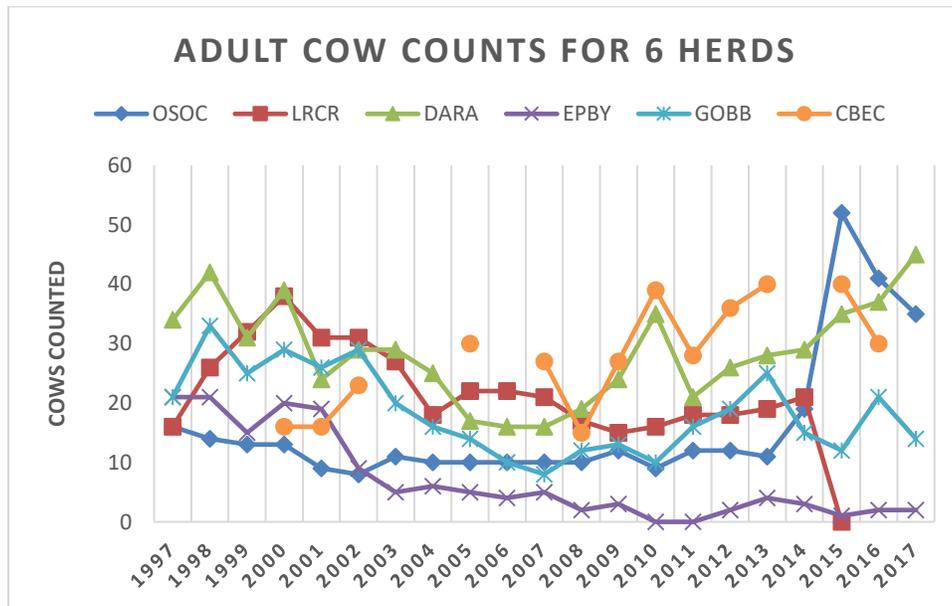
The January 2018 Prairie Creek herd estimate was 74 (F. Weckerly, pers. comm.). The staff count for the DARA/EPBY and DARA herds combined also was 74. Calf and spike numbers matched closely between the 2 counts, however, cow and bull numbers did not. Staff counted 6 bulls, Weckerly counted 12, and staff counted 7 more cows than did Weckerly. The Gold Bluffs Beach counts were nearly identical between counts for both total numbers and classification. The total OSOC herd numbers differed by 1 between the 2 counts, due to differences in cow/calf classifications. Overall the numbers indicate good reliability with staff counts and classification for herds below the Bald Hills in the parks.

<sup>1</sup> The high count for this herd, on January 12, was 277 but with few animals classified. Table numbers demonstrate animals classified in the herd during the next highest count on January 15.

<sup>2</sup> This herd was not classified in 2017.

Cow counts by year, the best indicator of herd persistence (McCullough *et al.* 1994, Weckerly and Francis 2004, Weckerly 2017), are displayed in Figure 1. Cow numbers for all herds for all years are provided in Appendix A. In 2015, the OSOC and LRCR herds coalesced into a single herd, now referred to as the OSOC herd.

In the fall, staff observed a small group of 2 bulls, 2 cows and 1 calf in Elk Prairie, home of the EPBY herd. In June, 2 cows, each with a calf, plus 9 bulls were observed in Elk Prairie. Weckerly observed only bulls (9-10) in Elk Prairie in January (F. Weckerly, pers. comm.). The GOBB herd, that normally ranges widely over a large area and is difficult to count, was observed as an all-ages group. Except for 2013 when the count was 25, the 2016 cow count for GOBB was the highest it's been (22) since 2002 (Figure 1).



**Figure 1. RNSP fall elk herd cow numbers from 1997 to 2017 indicating herd persistence through time. The CBEC herd counts are opportunistic each year, missing data points do not represent zeros. The LRCR and OSOC herds merged in 2015.**

The highest fall cow count in each herd was used to determine calf:cow ratios; the ratio of calves to cows is an indication of herd productivity. The ratio of calves to cows in the coalesced OSOC/LRCR herd, continued to be low for the 3<sup>rd</sup> year since the two herds combined in 2015 (Table 2).

**Table 2. Calves per 100 cows for coastal elk herd counts, 2003 to 2015 (N/A = data not available).**

Herd	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
OSOC	27	10	40	30	40	40	25	55	16	8	45	32	29	34	28
LRRCR	11	22	18	45	33	23	20	56	44	61	58	29	--- <sup>1</sup>	--- <sup>1</sup>	--- <sup>1</sup>
DARA	21	24	12	18	56	37	33	22	38	18	42	38	29	27	31
EPBY	20	50	0	25	60	100	33	0	0	50	50	100 <sup>2</sup>	100 <sup>2</sup>	100 <sup>2</sup>	50
GOBB	15	6	17	30	50	50	54	60	44	53	20	53	17	24	50
CBEC	N/A	N/A	N/A	N/A	30	40	30	5	14	28	20	N/A	37	53	N/A

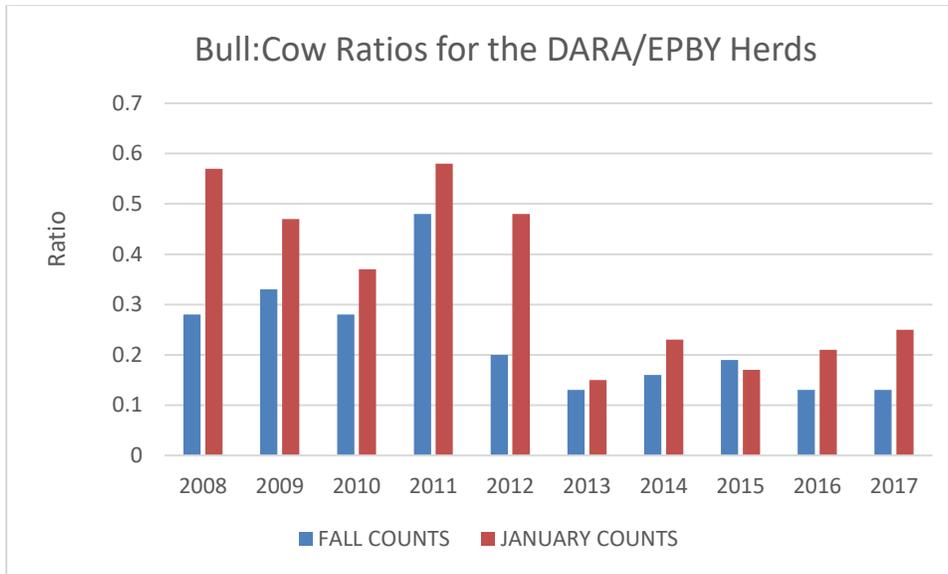
<sup>1</sup> The ratio is included in the OSOC herd ratio due to herds coalescing.

<sup>2</sup> The 1:1 calf/cow ratio was due to 1 cow present with a calf.

In January 2018, the calf:cow ratio in Weckerly’s Prairie Creek herd was 0.40 (F.Weckerly, pers. comm.). The fall staff counts indicated a calf:cow ratio of 0.32 when the EPBY and DARA herds were combined and 0.31 for the DARA herd alone. In 2017, staff counted 15 calves in the 2 herds combined; Weckerly’s count was 16. No cows or calves were present in January 2018 when Weckerly surveyed Elk Prairie. Given that the staff fall count and Weckerly’s January count were equal it is probable that staff misclassified large calves as cows during their high count that occurred on October 2.

This year it was possible to calculate the calf:cow ratio for the Bald Hills herd, but the January 2018 ratio was based on the day with the second highest number of animals counted. Classification is difficult with this herd due to its size and juxtaposition within the landscape. To get an accurate herd count and classification, conditions for viewing the animals must be optimal, e.g., the herd is in clear view or moving in single file across an opening. The calf:cow ratio for this herd was 0.18 in January 2018, down from 0.26 in January 2017.

Bull:cow ratios may indicate the quantity of available forage. Like many large herbivores, male and female Roosevelt elk partition habitat spatially. In the Elk Prairie and Davison meadows (EPBY and DARA herds) males are more likely to use forests that have lower quantities of forage biomass and thus forage more widely (Weckerly 2005). Also, when food is less abundant males may use forested habitats more frequently, making direct observation difficult (Weckerly *et al.* 2004, Weckerly 2007). In January 2018, Weckerly observed a bull:cow ratio of 0.25 for the Prairie Creek herd, nearly double the 0.13 ratio staff found for the DARA/EPBY herds combined the previous fall. This was similar to the discrepancy between the fall and January ratios in 2016; in fact, there has been only 1 year in the last 10 when the bull:cow ratio was greater in the fall than in January (Figure 2). The cause of the lower fall bull:cow ratios could be due to differences in methodology between the 2 counts. Ratios from staff counts are based on actual numbers of animals observed, while Weckerly uses a mark-resight method that accounts for imperfect detection, and use Bowden’s estimator to adjust for biased low sex ratio estimates (Weaver and Weckerly 2011, Bliss and Weckerly 2016).



**Figure 2. Bull: Cow ratios for the DARA/EPBY (Weckerly’s Prairie Creek) herd during a 10-year period. Fall counts are done by park staff Sept.-Nov. and Weckerly’s are done in January of the following year.**

**Herd Summaries**

*Old South Operations Center (OSOC)*

The total count for the OSOC herd was down by 10 from 2016. However, there were only 2 counts obtained in 2017, compared to 7 in 2016. The Lower Redwood Creek herd (sometimes referred to as the “Levee” herd in previous reports) coalesced with the OSOC herd in 2014 (RNSP 2015) after a local landowner opened his gated cow pasture which permitted elk access to the pasture. Elk ingress and egress between the private pasture and the park has ostensibly been occurring ever since. The increased available food resource is likely the cause for the breakdown in separation previously kept by the OSOC and LRRC herds, and perhaps due to an increased threat of hunting in the private pastures adjacent to the park (Kolbe and Weckerly 2015, Weckerly 2017). Weckerly’s best count was 39 cows and 7 calves, the staff count was 35 cows and 10 calves.

*Davison Ranch (DARA) Herd*

This herd consists of a group of mature bulls that often occupies the northern portion of Elk Meadow north to the Lost Man Creek Fish Hatchery, and a cow group that occupies the southern portion of Elk Meadow south to Skunk Cabbage Creek. These animals also frequent the Redwood Adventures Lodge property west of Highway 101 and, on the east side of the highway, the lawn of the Green Diamond Resource Company office, the private residence across from the footbridge over Prairie Creek and the cow pasture west of the former Mill A site. The number of cows counted by staff (45) matched last year’s highest-ever recorded for the herd, and when the 2 cows from EPBY observed in the fall are included, the number matches Weckerly’s January count of 47 for the Prairie Creek herd. The calf:cow ratio was 0.31 in 2017, up from 0.27 in 2016

but below 0.38 of 2014. The bull:cow ratio was way down, at 0.09, however this didn't take into account the animals from the EPBY herd. Weckerly reported a bull:cow ratio of 0.30 in January 2018 that included 10 bulls from the EPBY herd.

#### *Elk Prairie /Hwy 101 Bypass (EPBY) Herd*

This herd, considered extinct (Weckerly 2017) consisted of a small group of 5 animals in fall 2017 that included 2 bulls, 2 cows and 1 calf. Earlier in the year 2 calves were seen and in late June a park employee reported a herd of 13 including the 2 cows with their calves, plus males of which 2 may have been spikes.

#### *Gold Bluff Beach (GOBB) Herd*

The GOBB herd uses a large area that extends from Mussel Point at the south end of Gold Bluffs Beach to Carruther's Cove near the northern limit of this beach, a distance of 12 miles. They also on occasion leave the beach area, moving into the forest above the beach and east towards Newton B. Drury Parkway. This herd is difficult to count because of the large area the animals use and the brushy nature of the coastal bluffs which can obscure individuals. The number of cows counted (14) was below those counted last year but similar to numbers of recent years (see Appendix A). In contrast, the bull:cow ratio was the lowest on record at 0.05, with only 1 bull present with the cow group for the second year in a row. However, on July 26, 2017, 3 bulls were observed with the cow group. Weckerly also counted 14 cows on 4 days and saw either 1 or no bulls.

#### *Crescent Beach Education Center (CBEC) Herd*

The CBEC herd is most often counted from the education center office, whose windows face the meadow west of the building. This herd was not classified in fall 2017 due to limited staffing. On July 4, 2017, 32 cows, 16 calves, 4 spikes and 3 bulls were recorded lying down in the meadow close to the office. This is 4 fewer animals than were recorded in the total (unclassified) herd in September.

#### *Bald Hills (BAHI) Herd*

There were 10 counts in the Bald Hills in 2018, from January 4 to January 16. The high count in 2018 for the BAHI herd was 276, not including the 1 bull observed, an increase over last year's 247. The cow count was 153 when the total herd count was 197; this cow count was lower than in most years since 2012.

Winter survey routes in the Bald Hills are available in previous unpublished annual elk reports (Bensen 2005, Schmidt 2009).

#### **Other Observations**

There were 8 incidental observations recorded in the parks' Wildlife Observations database in 2017, most of which were turned in by staff. One report was of an apparently sick animal lying

“limp” on the ground, and another of a female limping heavily while other females were behaving aggressively toward her.

## **Incidents**

### *Calving Season*

There were 3 reported incidents involving aggressive cow elk in 2017. Two reports were from the GOBB calving area around Fern Canyon. The first, near the Fern Canyon parking lot, was on May 8 when 18 animals consisting of “cows and large calves” were encountered by 2 separate groups of visitors on the trail. According to the report, 3 elk would not move out of the trail and one elk bluff-charged a man. The elk approached within "2 arms' length". Another group of people *approached the elk* to within "1 arm's length or closer".

Two days later on May 10, 200 ft from the Fern Canyon trailhead the entire herd was feeding near the trail. At 6:30 p.m. 4 visitors passed by the animals without incident. On the way back at 7:30 p.m. the elk had moved to the east side of the trail. They alerted but did not move. The pair of hikers decided to wait for the elk to move. At 8:00 p.m. the pair approached the herd that was now on the side of the trail and in the parking lot. The largest animal, assumed to be a bull, walked toward the 2 people. At approximately 10:30 p.m. the pair were able to get to their friends after the elk moved into the grassy area south of the parking lot.

At the Elk Meadow viewing area (DARA herd), on June 15 there were many people watching elk. One cow trotted through the group of people. A woman was getting close and the elk looked agitated. A uniformed NPS employee asked the woman to return to the parking lot and addressed others in the crowd about the importance of keeping a distance between themselves and the elk. A man behind the employee then approached a different cow elk. When the employee turned around, the elk was chasing the man. The elk got within 2-3 ft when the man got around his car. When the he took out a camera and started back to toward the elk, he was stopped by the employee.

### *Rut*

There was 1 report of aggression during the rut in 2017. On September 20, a bugling bull came around a corner and approached a park work crew that was pulling ivy on the edge of a road near an old mill site. It approached the group who retreated to their vehicles. The bull rejoined the herd after which the crew heard what sounded like the animals “fighting” in the vegetation.

### *Other*

On December 5, well past the rut, a bull and 8 cows plus at least 1 calf blocked access to Fern Canyon at the parking lot. The bull purposefully walked towards any hiker that tried to walk past on the trail and was intimidating people. Five people waited 30 minutes and could not pass. Twelve people joined into a group and were able to walk by slowly on their way to the canyon.

### *Entanglements*

There were no instances of antler entanglements in the parks in 2017.

### *Mortality/Injury*

There were 2 known elk mortalities and 1 minor injury documented in RNSP in 2017. On February 1, the carcass of a poached female was discovered off of Bald Hills Road in Childs Hill Prairie. The hindquarters and other meat were removed, the guts and other parts were left. On September 28, a dead female with a clean cut around the groin area was reported to and observed by a California Department of Fish and Wildlife (CDFW) Warden along Davison Road near Highway 101. The head and rumen were located near the Cal Trans yard across from Geneva (a.k.a. Lost Man Creek) Road. On October 4, staff followed up on a report of an injured elk near Elk Prairie Campground that had an open chest (puncture-like) wound possibly caused by another elk.

### **Annual Elk Hunts**

CDFW and the California State Fish and Game Commission regulate elk hunting in the State of California. Although no hunting is allowed in RNSP, CDFW's Northwestern California Roosevelt Elk Hunt includes lands in Humboldt and Del Norte counties in the vicinity of RNSP. This hunt may impact RNSP animals. Hunters acquire elk tags for this hunt by lottery draw; 15 bull tags and 3 either-sex tags were issued in 2017 for the Northwestern California hunt. Of these, 6 bulls were taken in the vicinity of Orick.

In 2016, the Shared Habitat Alliance for Recreational Enhancement (SHARE) program was created to improve public access to private land. One ranch in the Orick Valley is enrolled in this program; it was issued 3 tags in 2017, and 1 bull and 1 cow were taken. These animals and those from the Northwestern Hunt likely were from the OSOC herd.

The Private Lands Management (PLM) program offers landowners incentives to manage their lands for the benefit of wildlife through habitat conservation efforts. Green Diamond Resource Company (GDRC) and Stover Ranch hosted PLM hunts in the Bald Hills adjacent to or in the vicinity of the park. GDRC was issued 3 bull and 2 antlerless tags for this PLM in 2017. The hunt was 60% successful with 2 bulls and 1 cow harvested. The Stover Ranch was issued 4 bull and 2 antlerless tags. Four bull and 1 antlerless tags were filled for an 83% success rate. Both the Klamath and Stover Ranch hunts may impact the BAHJ herd.

### **CDFW Project: Investigating Abundance and Population Demography of Elk in Northwestern California**

Elk capture efforts for this research project began in January 2017. Adult cow elk were darted (tranquilized) and fitted with a GPS transmitter and ear tags prior to release. Eight elk from park herds were captured in 2017: 2 from the BAHJ herd; 2 from OSOC; 2 from DARA; 1 from GOBB; and 1 from CBEC. In addition, 9 calves were captured and ear-tagged with VHF transmitters. The calves were from all of the above herds except GOBB. All but 3 of the tagged calves either died or the tags failed within weeks or months of tagging (CDFW 2017). The study

is ongoing in 2018. Seven undergraduate and 4 graduate studies are associated with this project. The Humboldt State University graduate studies are:

Erin Nigon

Title: Dynamics of neonate elk survival and mortality in Northern California

Summary: Juvenile survival is known to be highly variable, yet is fundamental to understand what drives change in wildlife populations and necessary for successful game management. Factors influencing calf survival in Roosevelt elk populations in northwestern California are poorly understood. This study will monitor GPS collared elk and radio-tagged elk calves in Del Norte and Humboldt counties for two years. The objectives of this study are to 1) estimate calf survival and determine recruitment rates for Roosevelt Elk in the area 2) evaluate the effects of sex, body mass, and birth date on annual calf survival and 3) identify factors influencing elk survival by investigating mortalities across all age classes.

Rudy Mena

Title: Herd counts and composition, habitat use and movements of Roosevelt elk in Northern California.

Summary: The objective of this study is to determine the efficacy of fecal pellet counts for use in population size estimates via fecal capture-recapture during a period of increased social cohesion of Roosevelt elk groups. This project aims to determine if: 1) fecal pellet distribution within elk home ranges can accurately describe group habitat use, and as a result 2) that site fidelity of elk groups increases the capture rates of individuals during fecal mark-recapture sampling occasions.

Emily Armstrong Buck

Title: *Escherichia coli* and *Salmonella enterica* in Roosevelt elk and cattle: enteric pathogens at the wildlife-domestic interface

Summary: This study will evaluate the prevalence of pathogens and parasites in elk and cattle in a preliminary attempt to determine risks of spillover and spillback between these species and may provide insight into demographic patterns observed. Specifically, the prevalence of *Salmonella enterica* and *Escherichia coli* are being examined in elk and domestic cattle.

Adam Mohr

Title: Habitat selection of Roosevelt and Tule elk

Summary: This study will use the location data collected from collared cow elk to investigate different aspects of their spatial ecology. A major component of this will be modeling the influence environmental factors (e.g. vegetation type, elevation, drought, development etc.) have on elk habitat selection. This will be done by applying newly developed spatial analysis techniques to gain new insight into elk travel corridors, parturition-related movements, and early neonatal survival.

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Report prepared by Kristin Schmidt, Wildlife Biologist, Redwood National and State Parks

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#### PERSONAL COMMUNICATION

Dr. Floyd "Butch" Weckerly, Texas State University, San Marcos, TX

Appendix A

Highest reliable (ranking <3) cow counts for identified elk herds, 1998 to 2017 (data displayed, in part, in Figure 1 in the report).

ND = no data available for that year.

Herd	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
OSOC	14	13	13	9	8	11	10	10	10	10	10	12	9	12	12	11	19	52	41	35
LRCR	26	32	38	31	31	27	18	22	22	21	17	15	16	18	18	19	21	0	N/A	N/A
BAHI*	--	--	--	--	--	--	--	--	--	--	--	--	--	--	188	240	193	131	191	153
DARA	42	31	39	24	29	29	25	17	16	16	19	15	23	21	28	26	29	35	37	45
EPBY	21	15	20	19	9	5	6	5	4	5	2	3	0	0	2	4	3	1	2**	2
GOBB	33	25	29	26	29	20	16	14	10	8	12	13	10	16	19	25	15	12	21	14
CBEC	ND	ND	16	ND	23	ND	ND	30	ND	27	15	27	39	28	36	40	ND	40	30	ND

\* Classification of this herd has only been possible since 2012.

\*\*From opportunistic counts in late July 2016.

## MICROSATELLITE ANALYSIS OF THREE SUBSPECIES OF ELK (*CERVUS ELAPHUS*) IN CALIFORNIA

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A total of 676 elk (*Cervus elaphus*) were genotyped at 16 tetranucleotide microsatellite loci to evaluate genetic differences among 3 subspecies of elk in California: tule (*C. e. nannodes*), Roosevelt (*C. e. roosevelti*), and Rocky Mountain (*C. e. nelsoni*) elk. Of the 13 populations analyzed, 5 represented tule elk herds, 3 were Roosevelt elk, 2 were Rocky Mountain elk, and 3 were of uncertain taxonomic status. Overall, populations averaged between 7 and 8 alleles per locus, with observed heterozygosity values ranging from 0.33 to 0.58 per population. Tule elk, which experienced a severe bottleneck in the 1870s, had consistently less genetic diversity than the other subspecies. All 3 subspecies were significantly differentiated, with the greatest genetic distance seen between the tule and Roosevelt subspecies. Assignment of individuals to subspecies using microsatellite data was nearly 100% accurate. Despite the past population bottleneck, significant differences were found among the tule elk herds. Assignment testing of elk from Modoc, Siskiyou, and Shasta counties to determine subspecific status of individuals suggested that these populations contained both Roosevelt and Rocky Mountain elk and their hybrids, indicating that these elk subspecies interbreed where subspecies coexist.

Key words: California, *Cervus elaphus*, elk, genetics, hybrid, microsatellite, population

Elk (*Cervus elaphus*) herds that roamed a large portion of North America have been reduced in both area and number due to hunting pressure and loss of habitat. Although management strategies have aimed to reintroduce elk to some of their original range, these programs are not without potential genetic consequence. Genetic bottlenecks and founder effects are of great concern, and exacerbated by harem mating structure and high variability in male reproductive success (Clutton-Brock 1989).

California contains 3 of the described subspecies of free-ranging elk: tule elk (*C. e. nannodes*; historic resident of oak woodlands and grasslands), Roosevelt elk (*C. e. roosevelti*; northwestern coastal area), and Rocky Mountain (*C. e. nelsoni*; occupying the extreme northeastern corner of California, including Modoc County) elk. The remaining extant subspecies, Manitoban elk (*C. e. manitobensis*), occurs east of the Rocky Mountains in the northern plains states and into central Canada

but does not inhabit California. Although each subspecies naturally occurs in different locations within California, there are potential geographic regions of overlap between Roosevelt and Rocky Mountain elk, allowing for the possibility of hybrid zones.

Tule elk residing in the Central Valley and oak woodlands of the foothills of California were almost eliminated after the gold rush of 1849 (McCullough et al. 1996). Historically estimated at more than 500,000 animals, tule elk were compromised by extreme hunting pressure and conversion of grass and woodland habitat into farming and agricultural operations. In 1873, when tule elk were thought to be extinct, protection was granted by the state of California (McCullough 1969; McCullough et al. 1996). Although exact numbers vary, it is believed that at least a single breeding pair of tule elk was found and protected in the southern San Joaquin Valley in Kern County, California, in 1874. Those remaining elk are believed to be the ancestors of extant tule elk populations in California (McCullough 1969; McCullough et al. 1996).

Roosevelt elk inhabit their historical range in the northwestern coastal mountain ranges of California (O'Gara 2002), mainly Humboldt and Del Norte counties. **Only elk inhabiting these 2 counties are categorized as Roosevelt elk by the Boone**

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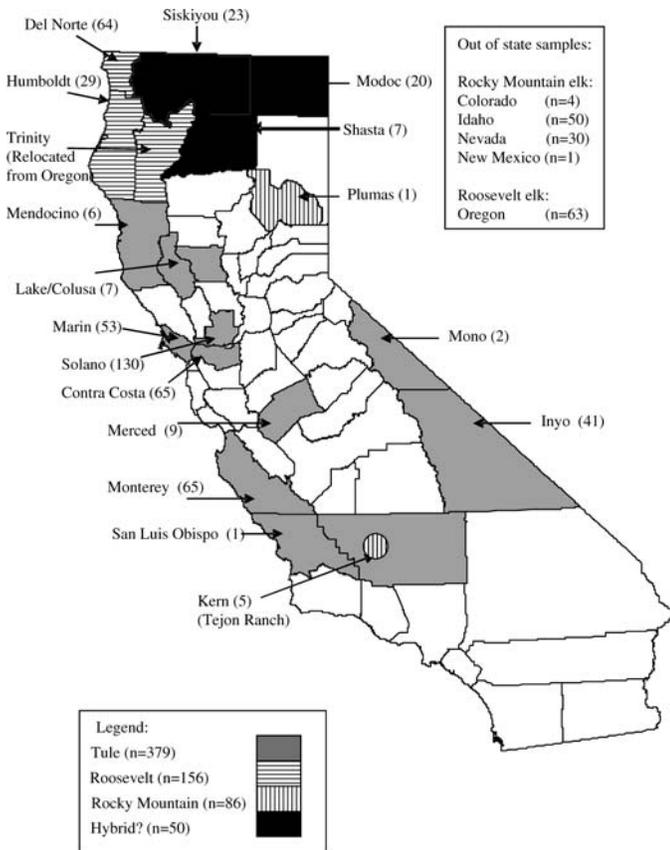


FIG. 1.—Map depicting number of individuals sampled at each herd location given by county name. Gray shaded areas represent counties that contain herds of tule elk, horizontal lines indicate counties with herds of Roosevelt elk, vertical lines indicate counties with herds of supposed Rocky Mountain elk, and diagonal lines indicate potential hybrid zones of Roosevelt and Rocky Mountain elk.

and Crockett Club (Missoula, Montana) for trophy-hunting purposes (Reneau and Reneau 1993). Discrimination of distinct herds of Roosevelt elk is difficult because of the dense forest habitat. Examination of satellite tracking data indicates restricted movement of animals and the possibility of distinct herds (R. Schaefer, in litt.).

Examination of satellite data (R. Schaefer, in litt.) provides evidence that Rocky Mountain Elk of northeastern California may migrate between Modoc County and Oregon, Idaho, and Nevada. Circa 1913, approximately 50 Rocky Mountain elk from Montana were introduced into Shasta County, California (R. Schaefer, in litt.).

Shasta, Siskiyou, and Modoc counties in northern California are considered to be potential hybrid zones for Roosevelt and Rocky Mountain elk by California Department of Fish and Game wildlife managers. For the purpose of our study, the term “hybrid” refers to an intraspecific cross. Interstate 5, a major north–south highway in Washington, Oregon, and California, has been used as an arbitrary management boundary for subspecies delineation: elk occurring west of Interstate 5 have been designated Roosevelt and those to the east of Interstate 5 as Rocky Mountain elk. Lone elk are known to wander and travel great distances (>150 miles—R. Schaefer, in litt.), and

crossing the unfenced Interstate 5 is likely, as inferred by presence of road-killed elk (R. Schaefer, in litt.). Because Roosevelt and Rocky Mountain trophy elk are recorded separately by hunting organizations, determination of the genetic lineage of animals in these areas will benefit trophy hunters and wildlife managers.

Subspecific status of North American elk has been hotly debated (see O’Gara [2002] for discussion of the taxonomy of North American elk). Overlap of morphological differences among tule, Roosevelt, and Rocky Mountain subspecies demands that other discriminating criteria, such as molecular genetic analyses, are used to address taxonomic status. Tule elk are considered the smallest subspecies of North American elk (Merriam 1905) and are typified by having lower body masses, lighter pelage, and the longest tooththrows of any North American subspecies. Roosevelt elk reportedly have the largest body mass and display different antler and jaw morphologies from the others (McCullough 1969; O’Gara 2002). Of the 3 subspecies, Rocky Mountain elk typically have the largest antlers (Reneau and Reneau 1993).

Evidence derived from mitochondrial DNA indicates that tule elk are more closely related to Rocky Mountain than Roosevelt elk, and supports the subspecific status of these 3 categories of elk (Polziehn et al. 1998, 2000; Polziehn and Strobeck 1998, 2002). Using microsatellite data, Williams et al. (2004) showed that tule elk display reduced genetic variation relative to Rocky Mountain and Manitoban elk; however, small sample size prevented robust tests of genetic differentiation among populations of tule elk.

The primary goal of our study was to measure the degree of nuclear genetic differentiation between tule, Roosevelt, and Rocky Mountain elk and evaluate whether the populations of elk in California warrant status as evolutionarily significant units. Given that Roosevelt and Rocky Mountain elk are sympatric in California, yet recorded separately for trophy records, wildlife managers will benefit from genetic information that identifies subspecies composition, particularly in potential hybrid zones. Genetic discriminators will allow identification of subspecies in trophy animals, hair samples from field sampling efforts, and forensic samples. Toward these objectives, we used 2 population assignment programs, WHICHRUN (Banks and Eichert 2000) and STRUCTURE 2.1 (Pritchard et al. 2000), to test the accuracy of assignment to subspecies from multilocus genotype data. Lastly, we assessed the risks and degree of inbreeding faced by herds of tule elk and make recommendations for monitoring and managing these herds.

## MATERIALS AND METHODS

*Sample collection and DNA isolation.*—A total of 676 elk were analyzed in this study (Fig. 1). The majority of the samples were from a large tissue archive maintained by the California Department of Fish and Game’s Wildlife Forensic Laboratory (Rancho Cordova, California). Tissue and blood samples were collected from road-killed animals or animals legally taken at scheduled hunts and elk relocations throughout

California from 1997 through 2003. Samples were shipped frozen on ice to the Wildlife Forensic Laboratory and maintained at  $-20^{\circ}\text{C}$  until DNA extraction.

Tule elk from 8 herds were sampled, including 2 of the original 3 surviving herds established in the 1930s: the Owens Valley herd (Inyo County) and the Cache Creek herd (Colusa and Lake counties). The remaining 6 herds of tule elk sampled were created by later translocations; however, all herds of tule elk are descendants from 1 original remnant population.

Samples of Rocky Mountain elk collected from Nevada and Idaho served as reference samples for comparison to Rocky Mountain elk in California. Five Rocky Mountain elk originally translocated from Wyoming to Tejon Ranch in Kern County, California, were sampled. **Roosevelt elk from Jewell, Oregon, and translocated to Trinity County, California, between 1988 and 1995 were examined.** The Nevada Department of Wildlife supplied muscle tissue samples of 30 Rocky Mountain elk, and the Idaho Department of Fish and Game provided 49 diluted DNA extracts (10 ng/ $\mu\text{l}$ ) and 1 muscle tissue sample.

The DNA was isolated from all tissue and blood samples using Qiagen QIAmp tissue isolation kits and procedures (Qiagen, Chatsworth, California). After extraction, DNA was quantified using a Molecular Dynamics model 595 Fluorimager (Molecular Dynamics, Sunnyvale, California) using human DNA reference standards of known concentration. DNA from extracted tissue samples was diluted to a concentration of 10 ng/ $\mu\text{l}$ ; blood extracts were not diluted.

**Microsatellite analysis.**—Multiplex polymerase chain reaction was used to amplify 16 tetranucleotide microsatellite markers developed specifically for elk or mule deer (*Odocoileus hemionus*; see Table 1 for references). All loci used were developed from enriched libraries by GIS Inc. (Chatsworth, California). These primers were selected based upon their highly repeatable polymerase chain reaction products and variability within and among the 3 subspecies of elk described herein.

Forward primers were fluorescently labeled with 6FAM, VIC, or NED (Applied Biosystems, Foster City, California) and the reverse primer had a 5'-GTTTCTT-3' extension added to the 5' end to reduce split peaks and drive the reaction to the "plus A" band (Brownstein et al. 1996). Polymerase chain reaction fragments were detected using a BaseStation DNA Fragment Analyser (MJ Research, Inc., Waltham, Massachusetts).

Each amplification cocktail included up to 20 ng of template DNA, 1X PCR buffer (Applied Biosystems), 2.4  $\mu\text{l}$  of multiplex specific primer concentrations (see below), 0.2 mM of each deoxynucleoside triphosphate, 2 mM  $\text{MgCl}_2$ , and 0.2 U (Multiplex D, A, and E) or 0.25 U (Multiplex N) Amplitaq (Applied Biosystems) and double-distilled  $\text{H}_2\text{O}$  to total 20  $\mu\text{l}$  per reaction. Polymerase chain reaction primer concentrations are indicated in Table 1. Reactions containing at least 5 ng/ $\mu\text{l}$  DNA were run on a PTC-100 thermalcycler (MJ Research, Inc.) with the following amplification parameters:  $94^{\circ}\text{C}$  for 3 min, followed by 26 cycles of  $94^{\circ}\text{C}$  for 30 s,  $58^{\circ}\text{C}$  for 30 s,  $72^{\circ}\text{C}$  for 40 s, a final extension at  $72^{\circ}\text{C}$  for 20 min, and a final hold at  $10^{\circ}\text{C}$ . All blood samples and tissue samples containing

**TABLE 1.**—Summary of loci examined in this study. This table shows in which multiplex each locus was amplified, polymerase chain reaction (PCR) primer concentration (each primer), 5' fluorescent dye label used, number of alleles, heterozygosity values observed ( $H_O$ ), and the reference in which the original primer sequences can be found. Note that all the reverse primers were modified with a 5'-GTTTCTT sequence to reduce split peaks and encourage the formation of "+A" bands during polymerase chain reaction. References: 1 = Jones et al. (2002); 2 = Meredith et al. (2005); 3 = Jones et al. (2000).

Locus	Multiplex	PCR concentration ( $\mu\text{M}$ )	5' dye label	No. alleles	Size range (base pairs)	$H_O$	Reference
T108	D	0.100	6Fam	8	136–181	0.540	1
T26	D	0.483	6Fam	12	328–398	0.565	1
T172	D	0.017	Vic	7	174–198	0.450	1
T501	D	0.600	Ned	9	252–290	0.576	1
T268	N	0.092	6Fam	6	228–256	0.437	1
T156	N	0.062	Vic	15	143–249	0.545	1
T507	N	0.062	Ned	11	148–202	0.390	1
C273	N	0.985	6Fam	8	132–166	0.553	2 and 3
T193	A	0.706	6Fam	10	184–220	0.599	1
C217	A	0.212	Vic	2	185–193	0.415	1
T123	A	0.282	Ned	4	155–186	0.399	1
C180	E	0.048	6Fam	4	156–168	0.507	2
T107	E	0.144	Vic	4	242–265	0.326	2
C229	E	0.144	6Fam	5	299–319	0.363	2
C143	E	0.240	Ned	4	166–178	0.492	2
C01	E	0.624	Ned	5	342–358	0.433	2

less than 5 ng/ $\mu\text{l}$  DNA were amplified for 30 cycles. One microliter of polymerase chain reaction product was then added to 4  $\mu\text{l}$  of loading buffer (double-distilled  $\text{H}_2\text{O}$ , formamide, blue dextran, Genescan 400HD ROX [Applied Biosystems], and Genescan 500 ROX [Applied Biosystems] mixed in a ratio of 220  $\mu\text{l}$ :155.2  $\mu\text{l}$ :51.7  $\mu\text{l}$ :12  $\mu\text{l}$ :12  $\mu\text{l}$ ). Polymerase chain reaction products were separated using a denaturing 5.5% acrylamide gel (Long Ranger Gel Solution, Cambrex Bio Science Rockland Inc., Rockland, Maine). Gel data analysis and allele sizing were performed using Cartographer (MJ Research, Inc.).

**Statistical methods.**—Genotypic data were collected on all 676 samples. However, only those counties or states (Idaho, Nevada, and Oregon) with at least 20 animals ( $n = 632$ ) were used in frequency-based analyses, specifically the calculation of  $F$ -statistics and log-likelihood statistics of population differentiation. Because the alleles were not sequenced to determine the actual number of tetranucleotide repeat units, statistical models conforming to the infinite alleles model were used.

**Allele frequencies, unique alleles, and observed and expected heterozygosities within counties or states ("populations") with a minimum of 20 individuals and within each of the 3 subspecies were calculated using GENEPOP on the Web (<http://www.biomed.curtin.edu.au/genepop>—Raymond and Rousset 1995).** For frequency-based analyses, the populations of Roosevelt elk used were from Humboldt and Del Norte counties (California) and Jewell, Oregon; the populations of Rocky Mountain elk used were from Nevada and Idaho. Deviations from linkage equilibrium between all pairs of loci

across all populations and conformation to Hardy–Weinberg equilibrium on a locus-by-locus basis within populations also were tested using GENETPOP. The  $P$ -value for a significant deviation from Hardy–Weinberg equilibrium using the exact test (Guo and Thompson 1992) was adjusted from 0.05 to 0.00027 using a Bonferroni adjustment for 186 tests of the same hypothesis (16 loci by 12 populations with 6 loci being monomorphic in a population). A Bonferroni-adjusted  $P$ -value of 0.0014 was used to assess significance for multiple tests of deviation from Hardy–Weinberg equilibrium at the subspecies level (3 subspecies and 16 loci).

Quantitative measures of population differentiation ( $F_{ST}$ ) and inbreeding ( $F_{IS}$ ) were made among subspecies and among populations within subspecies using the software package FSTAT (FSTAT, a program to estimate and test gene diversities and fixation indices, version 2.9.3, J. Goudet, 2001; <http://www.unil.ch/izea/software/fstat.html>) as described in Weir and Cockerham (1984) after Bonferroni-adjusted pairwise significance levels. Samples from Modoc, Shasta, and Siskiyou counties were not used in the comparisons of subspecies populations because the taxonomy of elk from these 3 counties was uncertain.

Analysis of molecular variance (AMOVA; ARLEQUIN—Schneider et al. 2000) was used to evaluate the degree of population differentiation based on the relative number of repeats. Genotypic data were analyzed using subspecies, populations within subspecies, and individuals within populations as sources of variation.

The measure of genetic distance among 12 of the county or state sampling groups was Nei's standard distance ( $D_s$ —Nei 1972), calculated in PHYLIP, version 3.5c (Felsenstein 1993) using GENDIST. The neighbor-joining method was used in NEIGHBOR (PHYLIP, version 3.5c—Felsenstein 1993).

Animals were assigned to subspecies using genotypic data and 2 population assignment software packages, WHICHRUN (Banks and Eichert 2000) and STRUCTURE 2.1 (Pritchard et al. 2000), to test accuracy of assigning to presumptive subspecies. Elk from the hybrid zones were excluded because of the confounding effects of uncertain lineage. A baseline genotype data file was constructed using known reference animals, including 367 tule elk, 156 Roosevelt elk, and 80 Rocky Mountain elk. The tule elk baseline reference samples consisted of animals from Contra Costa County ( $n = 65$ ), Inyo County ( $n = 41$ ), Lake County ( $n = 5$ ), Marin County ( $n = 53$ ), Monterey County ( $n = 65$ ), and Solano County ( $n = 130$ ). Roosevelt elk baseline samples included Del Norte County ( $n = 64$ ), Humboldt County ( $n = 29$ ), and Oregon ( $n = 63$ ). Rocky Mountain elk baseline samples included elk from the states of Idaho ( $n = 50$ ) and Nevada ( $n = 30$ ).

In WHICHRUN, the probability of a given sample belonging to a "critical population" was generated by a likelihood ratio log of odds score of the probabilities of the 1st and 2nd most probable population assignment given that sample's genotype. The baseline data file of the 603 samples was jackknifed, a log of odds score was generated for the most probable population assignment, and each sample was assigned to that subspecies with log of odds score of  $\geq 1.0$ .

WHICHRUN was then used to assign individual elk from Modoc, Siskiyou, and Shasta counties to Rocky Mountain or Roosevelt subspecies with log of odds score of  $\geq 1.0$ . Five elk from the Tejon Ranch (Kern County) and 6 elk from Mendocino County also were analyzed for subspecies verification. The 6 elk from Mendocino County were collected in 2 different locations. An individual was assumed to be a possible hybrid if the log of odds score for both Roosevelt and Rocky Mountain was  $\leq 1.0$ . The same analysis parameters were used for assignment testing of baseline data and for animals of unknown ancestry.

The baseline genetic data also were tested for assignment accuracy using the program STRUCTURE using 100,000 rounds of iteration after a 10,000-round burn-in. The STRUCTURE genetic analysis program also was used to test assignment of reference elk and samples from Modoc, Siskiyou, and Shasta counties. STRUCTURE was used to estimate the number of lineages that comprise the counties or states without using a priori population information. The number of populations ( $K$ ) was evaluated for 1–20 populations. Most likely number of populations was determined by  $\Delta(K)$  as described in Evanno et al. (2005).

Elk were classified as potential hybrids if the most probable subspecies was <10 times more likely than the 2nd most probable subspecies, indicative of past introgression. This is mathematically equivalent to the log of odds score threshold of 1.0 used in WHICHRUN for subspecies assignment.

## RESULTS

*Measures of genetic diversity.*—Within the 676 samples, loci possessed from 2 alleles (locus C217) to 15 (locus T156; average = 7.3) with observed heterozygosity values ranging from 0.33 (locus T107) to 0.60 (locus T193).  $F_{IS}$  estimated for the 5 herds of tule elk analyzed ranged from  $-0.038$  (Contra Costa County) to 0.079 (Inyo County). Tule elk displayed the lowest allelic diversity and showed no more than 5 alleles at each locus (average number of alleles = 3.2), with several loci being monomorphic in some of the tule elk herds. Rocky Mountain elk averaged 6.8 alleles per locus and Roosevelt elk were intermediate with an average of 5.2.

The 16 loci did not show departures from Hardy–Weinberg equilibrium within analyzed counties or states after a Bonferroni correction. However, when data were pooled by subspecies, several loci departed from Hardy–Weinberg equilibrium. No loci deviated significantly from Hardy–Weinberg equilibrium in the 80 samples of Rocky Mountain elk, 6 loci deviated from Hardy–Weinberg equilibrium within the samples of tule elk, and 1 locus deviated significantly from Hardy–Weinberg equilibrium within the samples of Roosevelt elk.

*Relationships among subspecies and populations (Table 2).*—There were significant differences in allele frequencies among populations of tule elk. Exact tests of population differentiation yielded a  $P$ -value of  $<0.0002$  and significance at all pairwise comparisons of the tule elk herds (1% level after Bonferroni corrections). The overall value of  $F_{ST}$  for the 5 populations of tule elk was 0.11.

**TABLE 2.**—Genetic distances among the 3 subspecies of elk (*Cervus elaphus*) in California and their populations. Data are presented for both the population and subspecific levels of comparison. Nei's standard genetic distance values are above the diagonal and  $F_{ST}$  values are below. Significance levels for pairwise tests are: \*\*\*  $P = 0.001$ , \*\*  $P = 0.01$ , and \*  $P = 0.05$  after a Bonferroni correction. The Oregon samples were collected from animals released into California from Oregon. Sample sizes for each population or herd are given in Fig. 1.

	Tule elk herds					Roosevelt elk populations			Rocky Mountain elk populations		Subspecies		
	Contra Costa	Inyo	Marin	Monterey	Solano	Del Norte	Humboldt	Oregon	Idaho	Nevada	Tule	Roosevelt	Rocky Mountain
<b>Tule</b>													
Contra Costa	—	0.03	0.12	0.03	0.07	0.49	0.64	0.42	0.46	0.62			
Inyo	0.06**	—	0.11	0.02	0.08	0.54	0.74	0.50	0.47	0.63			
Marin	0.19**	0.14**	—	0.10	0.08	0.42	0.61	0.34	0.37	0.45			
Monterey	0.07**	0.03**	0.13**	—	0.06	0.55	0.71	0.45	0.45	0.56			
Solano	0.12**	0.12**	0.10**	0.10**	—	0.41	0.59	0.39	0.39	0.53			
<b>Roosevelt</b>													
Del Norte	0.37**	0.33**	0.25**	0.34**	0.29**	—	0.18	0.09	0.31	0.53			
Humboldt	0.47**	0.42**	0.34**	0.42**	0.37**	0.12*	—	0.25	0.47	0.61			
Oregon	0.40**	0.37**	0.27**	0.37**	0.31**	0.06*	0.16*	—	0.17	0.31			
<b>Rocky Mountain</b>													
Idaho	0.33**	0.28**	0.21**	0.28**	0.27**	0.14**	0.19**	0.13**	—	0.09			
Nevada	0.38**	0.33**	0.25**	0.33**	0.31**	0.20**	0.24**	0.18**	0.03*	—			
<b>Subspecies</b>													
Tule											—	0.55	0.48
Roosevelt											0.30*	—	0.31
Rocky Mountain											0.28*	0.14*	—

Exact tests of population differentiation, as measured by allele frequencies, were highly significant ( $P < 0.0002$ ) among populations of Roosevelt elk (Oregon and Humboldt and Del Norte counties) and among populations of Rocky Mountain elk (Nevada and Idaho).  $F_{ST}$  values among populations of Roosevelt elk ( $F_{ST} = 0.096$ ) and between populations of Rocky Mountain elk ( $F_{ST} = 0.03$ ) were less than those observed among herds of tule elk. Individual populations of Roosevelt and Rocky Mountain elk showed significant differentiation at the 5% nominal level after Bonferroni corrections.

Data from the 3 subspecies were analyzed as a whole and tested for population differentiation using subspecies as the source of variation (Table 2). A highly significant Exact test ( $P < 0.0002$ ) suggested that there were greater differences in allele frequencies among the 3 subspecies than among populations or herds within any of the 3 subspecies. Pairwise tests of differentiation between the 3 subspecies were all significant at the 5% nominal level of significance after a Bonferroni correction. The AMOVA results (Table 3) indicated that the subspecies are well differentiated.

STRUCTURE yielded results, both in terms of  $K$  populations and  $\Delta(K)$ , that suggested the sampled elk are from 2 “populations”: tule and Roosevelt–Rocky Mountain elk lineages. Although the likelihood values for  $K = 1$ –20 populations approached a maximum at  $K = 3$  populations, the  $\Delta(K)$  values spiked at  $K = 2$  populations.

Subspecies clustered distinctly, with 100% bootstrap support between tule elk and the other 2 subspecies (Fig. 2). The node separating the 2 Rocky Mountain elk populations (Idaho and Nevada) from the other subspecies populations had a 94% level of bootstrap support.

Assignment testing.—All of the 367 samples presumptively categorized by wildlife managers as tule elk assigned correctly using both WHICHRUN and STRUCTURE (Table 4). STRUCTURE was slightly more accurate in assigning reference elk to their presumptive subspecies, although both programs yielded a very high success rate of correct assignment. Population assignment of Roosevelt and Rocky Mountain elk had a small error rate (<5%), which varied by analysis program. One presumptive Roosevelt elk collected from eastern Oregon (Bend, Oregon) was assigned to the Rocky Mountain subspecies with >3.0 log of odds score.

Assignment testing of individual elk using both STRUCTURE and WHICHRUN (Table 5) revealed that Modoc, Shasta, and Siskiyou counties were inhabited by Rocky Mountain, Roosevelt, and hybrid elk. The same individuals were identified as hybrids by both programs. The 5 individuals from the Tejon Ranch in Kern County were correctly assigned as Rocky Mountain elk. The 6 elk from Mendocino County consisted of 2 Roosevelt elk and 4 tule elk.

**TABLE 3.**—Analysis of molecular variance of 3 subspecies of elk (*Cervus elaphus*) in California using subspecies, populations within subspecies, and individuals as sources of variation. Samples were collected from 1997 through 2003.

Source of variation	<i>d.f.</i>	Sum of squares	Variance components	Percentage of variation (%)
Among subspecies	2	905.12	1.253 Va	24.18
Among populations within subspecies	7	319.94	0.3631 Vb	7.00
Within populations	1,170	4,174.93	3.568 Vc	68.81
Total	1,179	5,399.99	5.185	

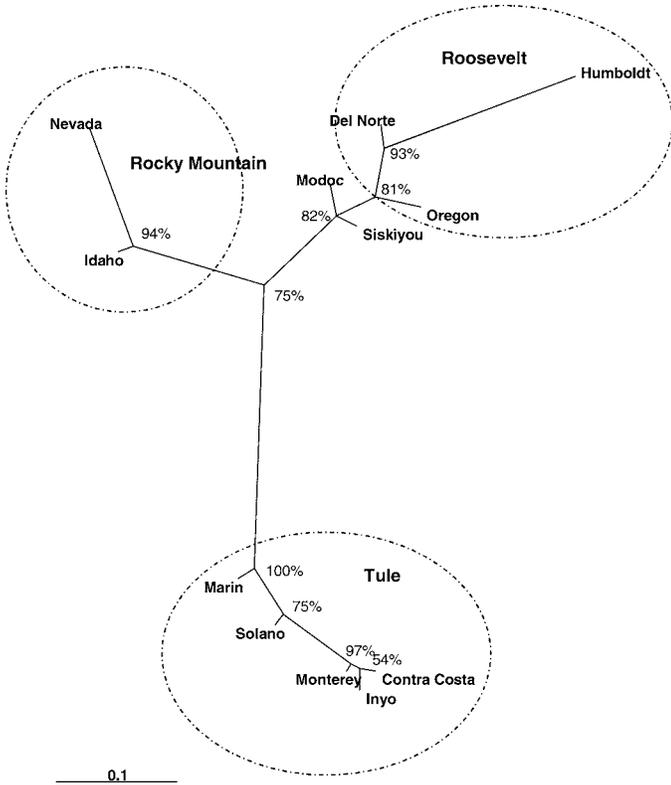


FIG. 2.—Unrooted tree of Nei's standard genetic distance after bootstrapping the data 1,000 times. The bootstrap level of support (out of 1,000) is indicated at each node. Included are all populations of elk with at least 20 samples.

DISCUSSION

Tule elk have much reduced microsatellite variation compared to the Roosevelt and Rocky Mountain elk subspecies, as expected given the severe population bottleneck in the late 1800s. The low level of genetic variability in the tule elk was likely due to the low numbers of founders rather than insufficient sampling, because sampling collections were well distributed among herds. Thus, the molecular genetic uniqueness of the tule elk resulted from lack of genetic variation, not from novel genetic variability.

Tule elk may have been reduced to 1 breeding pair in 1874 (McCullough et al. 1996). Barring a mutation event or experimental error, the presence of 5 alleles at 1 locus requires that the tule elk subspecies was reduced to no fewer

TABLE 4.—Assignment test results for 3 subspecies of elk (*Cervus elaphus*) in California using programs WHICHRUN and STRUCTURE 2.1. The numbers of correct assignments are on the diagonal and incorrect assignment counts are off the diagonal for each program.

Software	Subspecies	n	Tule	Roosevelt	Rocky Mtn.
WHICHRUN	Tule	367	367	—	—
	Roosevelt	156	—	151	5
	Rocky Mountain	80	—	1	79
STRUCTURE 2.1	Tule	367	367	—	—
	Roosevelt	156	—	154	1
	Rocky Mountain	80	—	—	80

TABLE 5.—Assignment tests of elk from Modoc, Siskiyou, Shasta, and Kern counties, California, using programs WHICHRUN and STRUCTURE. Animals are noted as potential hybrids using WHICHRUN when the log of odds score of assignment was less than 1.0, and when the probability of assignment was less than 10 times the 2nd most probable subspecies using STRUCTURE.

Program	County			
	Modoc (n = 20)	Siskiyou (n = 23)	Shasta (n = 7)	Kern (n = 5)
WHICHRUN				
Roosevelt	9	15	1	0
Rocky Mountain	10	2	5	5
Hybrid	1	5	1	0
STRUCTURE 2.1				
Roosevelt	9	15	1	0
Rocky Mountain	10	2	5	5
Hybrid	1	5	1	0

than 1 female and 2 males, or vice versa. Allele frequencies varied significantly among the herds of tule elk. The results also suggest that the herds in Contra Costa, Inyo, and Monterey counties were more closely related than the other 2 herds of tule elk; the Marin herd was the most distantly related. This also was reflected in the phylogenetic results (Fig. 2) and follows logically from historical information on relocations (McCullough et al. 1996). Because all tule elk originated from the same herd, founder effects and genetic drift likely caused the herds to diverge genetically in spite of relocation efforts.

Although tule elk do not currently display the effects of reduced fitness, such as low reproductive output and morphological deformities, the individual herds are definitely at risk if they remain genetically isolated. However, reduced genetic variation at neutral loci does not necessarily indicate a lack of adaptability (Hedrick 1999, 2001) and would not warrant intentional crossbreeding with Roosevelt or Rocky Mountain elk.

We propose the following management recommendations for tule elk given the genetic data and their life-history characteristics. Management of tule herds should continue to involve the movement of animals, preferably mature females, between the tule herds. Adult female elk would be much more likely to contribute genetically because of the harem mating structure, because an introduced male elk would likely have to establish dominance before breeding. Translocating elk among Inyo, Contra Costa, and Monterey counties should not negatively impact genetic diversity of these 3 herds, because they are closely related.

Periodic monitoring of the physical health and genetics of the tule herds is required in order to detect a rise in frequency of deleterious inherited phenotypes, reduced fitness, and other effects of inbreeding. Although the 6 elk samples from Mendocino County were either pure tule or pure Roosevelt and did not indicate crossbreeding, the elk in the Mendocino and Lake county areas should be monitored for hybridization. The tule and Roosevelt elk sampled were from 2 differ-

ent locations and did not occur sympatrically. Tule elk in Mendocino County have recently been detected in close proximity to Roosevelt elk (R. Schaefer, in litt.). Introgression of Roosevelt elk into these tule herds should prohibit their use for future transplants.

The reproductive strategy of elk makes this species vulnerable to the loss of genetic diversity. Williams et al. (2002, 2004) applied theory and computer simulation to conclude that elk in small isolated herds tend to lose genetic variation and heterozygosity. The effect of small population size is magnified by the highly polygynous nature of elk, and even brief bottlenecks can have a large effect on the number of alleles and heterozygosity of species with this mating system.

The effects of a small population size on a mammal are well illustrated by research on Florida panthers (*Puma concolor coryi*). Hedrick (2001) suggested that populations that remain small over a long time period would incur a large genetic load from fixation of many deleterious alleles of small effect, as seen in the Florida panther. Even with an effective population size of 30–50, this subspecies of panther so rapidly accumulated deleterious alleles through drift and inbreeding that it was in serious danger of extinction (Hedrick 1995).

Population assignment for individual reference elk with known source populations using multilocus genotype data was concordant with source population records because of highly significant differences in allele frequencies observed between the subspecies. Two population assignment software programs, WHICHRUN and STRUCTURE, yielded nearly identical assignment accuracies. This high degree of accuracy is important from a forensic standpoint because tule elk are a heavily managed subspecies within California; recaptured escapees from game refuges and evidence from suspected cases of tule elk poaching now can be reliably identified to subspecies.

Elk present in the northern California counties of Modoc, Siskiyou, and Shasta are genetically Roosevelt elk, Rocky Mountain elk, or hybrids of these 2 subspecies. Thus, trophy elk taken by sportsmen from these counties cannot be reliably assigned to subspecies in the absence of molecular genetic information. The unique genetic character of Roosevelt elk from California merits careful monitoring of translocations of elk if new animals are moved into the existing herds in Humboldt and Del Norte counties from areas containing elk of mixed ancestry.

Our analyses lend strong support to previously published work suggesting that tule, Roosevelt, and Rocky Mountain elk should be designated as discrete subspecies (Polziehn et al. 1998, 2000; Polziehn and Strobeck 1998, 2002) and as evolutionarily significant units. Values of  $F_{ST}$  and log-likelihood values for tests of population differentiation were highly significant. AMOVA results indicated that the subspecies are well differentiated and gene flow has likely occurred among populations within the subspecies.

The criteria used for determining which populations comprise an evolutionarily significant unit have been the topic of considerable debate (i.e., Crandall et al. 2000; Fraser and Bernatchez 2001; Moritz 1994, 2002). We incorporated

criteria from these studies and propose evolutionarily significant units for elk in California. Tule elk displayed highly significant differences in nuclear allele frequencies relative to other elk populations, consistent with the criteria of Waples (1991) and Moritz (1994, 2002). Given its unique ecological niche, evolutionarily significant unit status is warranted under the “ecological exchangeability” concept of Crandall et al. (2000).

We propose evolutionarily significant unit status for Roosevelt elk of the north coast of California (Humboldt and Del Norte counties). Again, significant genetic divergence was observed between this group and the other sampled populations. Because Roosevelt elk from the Olympic Peninsula in Washington State may have some Rocky Mountain introgression (Polziehn and Strobeck 2002), care (and perhaps genetic testing) is essential before translocating elk from the Olympic Peninsula to augment Roosevelt elk in other regions, including California.

Rocky Mountain elk are the least populous elk in California, although they exist in great numbers in the mountains of the western United States. They are genetically distinct from both the Roosevelt and tule elk and inhabit environments where the tule elk are absent. The only pure population of Rocky Mountain elk within California identified from this study occurs at Tejon Ranch (Kern County). These animals originally were imported from Yellowstone National Park, Wyoming. California Department of Fish and Game managers had expressed concern that these animals had bred with tule elk at 1 point in time; this concern appears unfounded. Rocky Mountain elk and tule elk are held at 2 physically separated ranches in Kern County. Although Rocky Mountain elk are sympatric with Roosevelt elk in northern California, their range extends beyond that of Roosevelt elk east into the Rocky Mountains. Elk taken from the counties containing hybrids should be genetically tested on an individual basis to determine the subspecies of their source. Polziehn et al. (2000) documented that population subdivision and restricted gene flow occurs in herds of Rocky Mountain elk, many of which were relocated or reintroduced. Considering that this subspecies covers a large geographic area, future studies covering larger geographic areas are likely to identify additional Rocky Mountain elk evolutionarily significant units.

To date, our study is the most comprehensive population genetic analysis of the 3 subspecies of elk inhabiting California and should provide valuable information for elk managers and wildlife law enforcement. Future conservation efforts should focus on ensuring connectivity between herds or populations within each evolutionarily significant unit to ensure that adaptive genetic variation is maintained in a large population and not removed by genetic drift or fixed by inbreeding in small isolated populations. Current population management efforts focus primarily on the protected tule elk, maintained as several distinct, isolated herds across the state. We recommend the continued translocation of tule elk between the herds in order to maintain the genetic diversity of the tule subspecies and avoid the potential inbreeding that can occur in small polygynous herds.

## ACKNOWLEDGMENTS

We thank California Department of Fish and Game wardens and biologists. Additionally, we appreciate the assistance of K. Rudolph (Idaho Department of Fish and Game), J. Dayton and B. Gonzales (California Department of Fish and Game) for acquisition of additional samples, and R. Callas (California Department of Fish and Game) for helpful information regarding Roosevelt and Rocky Mountain elk of California. The California Deer Association, the Rocky Mountain Elk Foundation, the Sacramento Safari Club, and the Mule Deer Foundation provided additional financial support for this research and the ongoing genetics research conducted by the Wildlife Forensic Laboratory of the California Department of Fish and Game. We also thank R. K. Wayne (University of California, Los Angeles) and anonymous reviewers for their many helpful comments. In memory of K. Levine, whose years of dedication to the Wildlife Forensic Laboratory ended far too early.

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*Keeping Northwest California wild since 1977*

*Sent via email on date shown below*

April 4, 2019

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**Dear Commissioners, Director Bonham, and Chief Lewis,**

On behalf of the Environmental Protection Information Center and the Friends of Del Norte (collectively “EPIC”), please accept these comments on the Draft Supplement Environmental Document for the North Coast Elk Management Unit (“SEIR”). After carefully reviewing the document and tiered associated documents, EPIC believes that the SEIR fails to take a hard look at the environmental consequences of increasing elk tags, and as such, the Commission should reject proposed changes to hunting tags and the Department should return to the Commission with a revised SEIR that adequately considers points raised in this letter.

### **SEIR Fails to Examine Reasonable Range of Alternatives**

The SEIR fails to analyze a reasonable range of alternatives by only considering maintaining the current level of hunting or increasing the total amount of hunting. In this manner, the SEIR is lacking and needs to be amended to consider a true range of alternatives—including alternatives that *reduce* the total amount of elk tags offered.

"CEQA requires that an EIR, in addition to analyzing the environmental effects of a proposed project, also consider and analyze project alternatives that would reduce adverse environmental impacts." *In re Bay-Delta Programmatic Environmental Impact Report Coordinated Proceedings*, 43 Cal.4th 1143, 1163 (2008); *see also* Guidelines, § 15126.6, subd. (a.) "An EIR need not consider every conceivable alternative to a project. Rather it must consider a reasonable range of potentially feasible alternatives that will foster informed decisionmaking and public participation. An EIR is not required to consider alternatives which are infeasible. The lead agency is responsible for selecting a range of project alternatives for examination and must publicly disclose its reasoning for selecting those alternatives. There is no ironclad rule governing the nature or scope of the alternatives to be discussed other than the rule of reason." *Watsonville Pilots Assn. v. City of Watsonville*, 183 Cal.App.4th 1059, 1086 (2010) (internal citation omitted.) In evaluating whether a decisionmaking is capable of making an informed decision, courts will often examine whether the alternatives presented "represent enough of a variation to allow informed decisionmaking." *Mann v. Cmty. Redevelopment Agency*, 233 Cal.App.3d 1143, 1151 (1991).

The Supplemental EIR fails to present a reasonable range of alternative by only examining whether alternatives that *increase* elk hunting, either by a little or a lot. Unconsidered by the SEIR is whether elk hunting should *decrease*—a reasonable suggestion, given changes to forage from global climate change, recovering gray wolf populations in the state, and the obligations of the Department and Commission.

The Department makes no explanation of why it did not consider a reduction in elk hunting. Presumably, the reason is similar to why the Department rejected Alternative 3, which would increase hunting tags by 10 tags: the alternative would "not optimize public hunting opportunities or alleviation of conflicts on private property." The Commission, however, has no obligation to issue the maximum number of hunting tags or to "optimize" hunting opportunities. As the Department admits, the Legislature has given the Commission substantial power to consider a wide range of considerations, including "populations, habitat, food supplies, the welfare of individual animals, and other pertinent facts," when setting tag numbers. The Commission *must* consider non-hunting recreational opportunities associated with elk and balance consumptive versus non-consumptive uses.

The Supplemental EIR examines four potential alternatives, including the "No Project" alternative. The Proposed Project would "[i]ncrease the tag quota range for the Northwestern Elk Zone by 20 tags," SEIR at 6, for a total of 108 elk tags issued. *Id.* at 19. Alternative 1, or the "No Project" alternative, would result in "[n]o change from the 2018-19 hunting regulations," *id.*, or stated another way, Alternative 1 would authorize the issuance of 88 elk tags. Alternative 2 would "[i]ncrease the tag quota range for the Northwestern Elk Zone by up to 60 tags." *Id.* Alternative 3 would also increase the number of elk tags issued by 10 tags. *Id.* In short, all the action alternatives analyzed only consider additional hunting.

In this manner, the alternatives analysis is comparable to the seminal case *California v. Block*, 690 F.2d 753 (9th Cir. 1982), which examined alternatives analysis under the substantially similar National Environmental Policy Act. In *Block*, the Forest Service was tasked with considering future potential additional Wilderness Areas. In doing so, the Forest Service

analyzed eleven alternatives—which is, by NEPA and CEQA standards, a large number of alternatives—but the Forest Service never examined any alternative that designated more than 33 percent of inventoried roadless areas to Wilderness. The Ninth Circuit found that the Forest Service’s analysis failed to provide a reasonable range of alternatives. As the court found important, the Forest Service was forced to weigh competing values—more wilderness or less—but in drawing a line at 33% and by not considering alternatives that considered *additional* acres of Wilderness, the Forest Service failed to examine information necessary to form a “reasoned choice.” This “trade off,” the court reasoned, “cannot be intelligently made without examining whether it can be softened or eliminated by increasing resource extraction and use from already developed areas.” Further, the court noted that “[w]hile nothing in NEPA prohibits the Forest Service” from adopting an alternative that added less Wilderness and not more, it was nevertheless “troubling that the Forest Service saw fit to consider from the outset only those alternatives leading to that end result.”

Here, the Commission cannot make a “reasoned choice” because it was only given alternatives that examined additional hunting. It never considered how less hunting impacts herd populations, non-lethal recreational opportunities, animal welfare, or the myriad of other things that the Commission is charged with considering. In the same manner, the Department’s analysis appears to predetermine a set outcome—more hunting—instead of grappling the hard trade offs that must be made.

### **Hunting Places Reproductively Stressful Pressures on Populations when Paired with Predation**

Hunting, together with predation, can affect herd population dynamics. Wolves have returned to California, although not to the Northwest EMU yet. That said, it is a matter of time before wolves return to the area. For example, the first wolf in approximately 100 years traveled through Del Norte County in 2019.

Wright et al. 2006 show that in a survey of antlerless elk, a large majority of the elk taken were considered to be at a “reproductively prime age.” That is, between the ages of 2-9 years. Wright then goes on to show that in the study, the combined influence of hunters taking out median ages, and predators taking out individuals at either extreme, herd numbers and viability began to decline. Please consider Wright, G. J., Peterson, R. O., Smith, D. W., & Lemke, T. O. (2006). Selection of Northern Yellowstone Elk by Gray Wolves and Hunters. *Journal of Wildlife Management*, 70(4), 1070-1078 in your final Supplemental EIR.

As reported by Hebblewhite (2005), wolf presence together with inclement weather (associated with a changing climate) produced more dramatic decreases in elk population growth rate than just inclement weather alone. *See* Hebblewhite, M. 2005. Predation by wolves interacts with the North Pacific Oscillation (NPO) on a western North American elk population. *Journal of Animal Ecology* 74:226-233. Further, changing weather can increase wolf predation rates. EPIC and the Department admit uncertainty over how these stressors will impact elk populations in real life. But it is this uncertainty that counsels that more analysis, through a larger range of alternatives, is more necessary to inform decisionmaking.

## **The SEIR Fails to Appreciate Risk from Vehicle Strikes**

The Supplement EIR's discussion on impacts from vehicle strikes is short and conclusory. It read, in total:

The number of elk killed by vehicles is not well documented. Unlike deer, very few elk in California appear to be killed by automobiles each year. Vehicle-caused elk mortalities have been reported (specifically with Roosevelt elk in Del Norte and Humboldt counties and tule elk in the Owens Valley and at Cache Creek) since 1990. Unreported incidents cannot be quantified. However, the [Department] believes effects of vehicle-caused mortality on statewide and localized elk populations are minimal.

The Department does not appear to be aware that increased vehicle strikes, perhaps together with increased poaching, likely caused the extirpation of an important herd of Roosevelt Elk. The Boyes elk were first documented in Boyes Meadows in 1937. By the late 1940s, their population ballooned to around 100, taking advantage of the newfound forage to jump in size. Over time the population settled; between 1950 to the late 1990s, the population fluctuated between 20-60 individuals. In 1998, there were 30 elk. By 2011, the herd was extirpated.

In 1984, Caltrans began planning for a bypass around the old-growth of the park—today, we call the original road the “Newton B. Drury Bypass.” This “improvement” came at a cost. The new road opened in 1992. Construction of the road created meadows and clearings, which were soon utilized by elk. Increased road kill soon followed. In places, the road is quite steep. Cars heading downhill (southbound) may find it difficult to stop or evade elk in the roadway. Similarly, elk may find avoiding humans more difficult. In 2003, Caltrans installed a barrier to separate north and southbound lanes. The barrier, intended to keep cars from cross lanes, was also likely effective in limiting elk mobility, making attempts by elk to evade or avoid vehicles more difficult. Elk and other ungulates have a difficulty assessing vehicle speeds and distance, perhaps making last minute maneuvers, and things that inhibit that flight response, more important. Furthermore, these elk were habituated to humans, and the elk may have had difficulty determining which vehicles detected them and wanted to slow to observe and which vehicles did not detect them or wanted to poach them.

Del Norte County provided records within their letter to the Department containing additional instances of elk strikes known to the county. Please consider these accounts and attempt a more meaningful investigation of potential impacts instead of relying on conclusory statements.

## **The Supplemental EIR Likely Downplays Impact of Poaching**

The Supplemental EIR appears to downplay the real danger that poaching plays on local elk populations in finding that poaching will not have significant adverse cumulative effects. To support this conclusion, the Supplement looks to, among other things, citation data from 1997, 1998, 2000 and 2001.

Since 2017, there have been six reported cases of poaching in the Northwestern EMU, including one pregnant elk:

- <https://lostcoastoutpost.com/2017/feb/8/dismembered-elk-found-redwood-national-park-ranger/>
- <https://lostcoastoutpost.com/2018/dec/14/four-roosevelt-elk-one-pregnant-killed-near-blue-l/>
- <https://lostcoastoutpost.com/2018/nov/1/elk-illegally-shot-death-arrows-north-orick-park-r/>

It is strange that EPIC, through a simple Google search, is able to turn up more recent data than the Department.

EPIC agrees with the Department that “[i]llegal harvest of game mammals is difficult to quantify.” As one article mentions, there had appeared to be an attempt to hide evidence of poaching. As most wildlife experts agree, most cases of poaching are not discovered and only one to five percent of poachers are caught. The Department, however, does not appear to be interested and dismisses poaching impacts by concluding, without evidence, that poaching is unlikely to have a significant cumulative effect.

### **The Supplemental EIR is Contingent on the “Elk Pop” Model, Yet the Model Appears Flawed and Lacks Indicia of Scientific Integrity**

EPIC is concerned about the Department’s reliance on the “Elk Pop” model, Smith, D. and D. Updike. 1987. Elk Pop, unpublished computer population simulation model. Department of Fish and Game, 1416 Ninth Street, Sacramento, California 95814. According to the Supplement, the model was produced by the Department and was released in 1987.

EPIC is concerned with the Department’s reliance on a model completed by itself over three decades ago used to justify the Department’s own decision. Additionally, there are other factors that call into question the reliability and integrity of the Elk Pop Model. Based on EPIC’s review of multiple scientific databases, it appears that the Elk Pop model was: (1) never been peer reviewed; (2) never validated by on-the-ground counts, or if validated, the data been made available. Given these issues, it is not sound for the Department to be reliant on the Elk Pop model.

Model results published in the appendix to the Supplement shows the number of elk killed by “non-hunting causes.” Presumably, this accounts for all other potential causes of mortality, such as vehicle strikes, poaching, starvation, predation, etc. The model assumes a rate of 23.5% of bulls lost to non-hunting causes and 11.9% of cows. It is not clear where these numbers come from. Again, a lack of validation concerns EPIC. Furthermore, we are concerned that the Department treats these numbers as static, despite a changing world. Assuming that the Department arrived at these mortality rates from observation in 1987, these represent a snapshot of conditions in that year. As the Supplement acknowledges, elk face a variety of population stressors, but that these stressors change from year to year, whether it is drought or poaching. Furthermore, as discussed above, climate change and new predators might increase the non-hunting mortality rate above historic levels.

**Conclusion: The Commission Should Reject the Draft SEIR as Incomplete and Request Revision from the Department**

Based on the concerns outlined above, EPIC requests that the Commission reject the Draft SEIR as incomplete and ask for revisions to ensure that the Commission can take a hard look at the likely environmental impacts of the proposed actions.

Should the Department or the Commission have questions regarding this letter, please do not hesitate to contact our organizations at [tom@wildcalifornia.org](mailto:tom@wildcalifornia.org) or (707) 822-7711.

Sincerely,

A handwritten signature in black ink that reads "Thomas Wheeler". The signature is written in a cursive, slightly slanted style.

Thomas Wheeler, Executive Director  
Environmental Protection Information Center

STATE OF CALIFORNIA  
FISH AND GAME COMMISSION  
INITIAL STATEMENT OF REASONS FOR REGULATORY ACTION

Amend Section 708.6  
Title 14, California Code of Regulations  
Re: Tag Countersigning and Transporting Requirements

I. Date of Initial Statement of Reasons: November 15, 2018

II. Dates and Locations of Scheduled Hearings

(a) Notice Hearing:           Date:           December 13, 2018  
  Location:       Oceanside, CA

(b) Discussion Hearing:       Date:           February 6, 2019  
  Location:       Sacramento, CA

(c) Adoption Hearing:        Date:           April 17, 2019  
  Location:       Santa Monica, CA

III. Description of Regulatory Action

(a) Statement of Specific Purpose of Regulation Change and Factual Basis for Determining that Regulation Change is Reasonably Necessary:

Critical to the management of California’s game populations is the countersigning of deer and elk tags indicating that the animal has been legally taken and transported from the hunting area. Countersigning is done by an authorized person who physically signs their name to the tag attached to the deer or elk carcass. In subsection 708.6(c) it is necessary to clarify for the public and law enforcement that “firefighters employed on a full-time basis” are authorized to countersign, in addition to the other authorized persons listed in 708.6. Part time, volunteer, or other fire station personnel are not included and cannot countersign the tag.

The terms “validate” and “countersign” are currently used interchangeably throughout this section. Countersigning deer and elk tags involves having a designated person physically sign their name to the actual tag attached to the deer or elk carcass. The statute in 4341 FGC specifies that:

*“Any person legally killing a deer in this state shall have the tag countersigned by ... a person designated for this purpose”.*

Section 708.11, Title 14, CCR, specifies that

*“... Elk tags shall be countersigned before transporting such elk, except for the purpose of taking it to the nearest person authorized to countersign the license tag....”*

Deer and Elk License Tags also specify, respectively, that

*“Hunter must have tag countersigned” and “Elk tags must be countersigned”*

For this reason, the proposed amendments clarify that “countersign (-ed, -ing, etc.)” is the required action, and removes text references to “validate (-ed, -tion, etc.)”. Other minor edits and renumbering are also proposed.

Deer and elk hunting is a highly regulated activity by both statute and regulation. It serves the public to have control over the number of game tags authorized for hunters in certain zones and, once game are taken by hunters, to have them properly accounted for. The first tool wildlife managers use to account for game harvest is the countersign requirement per subsection 708.6(b). Wildlife officers who frequently conduct poaching investigations and need to differentiate between a poached and legally taken deer or elk will check for the proper use of tags. Poached game is rarely properly tagged and countersigned, so it can be an excellent piece of evidence during a poaching investigation. If the tag is countersigned by an authorized person, it can also be a vital piece of evidence in an investigation because there is a named potential witness to the poaching event.

The data collected by hunters and submitted via mandatory reporting, including having those tags, is critical to managing deer and elk populations year-to-year and contributes to the continued availability of deer and elk hunting opportunities.

The Department recognizes the challenge for a person who returns from a successful hunting trip and needs the tag countersigned and must take the game to the nearest person authorized to countersign the license tag on the route followed from the point where the game was taken. Section 708.6 provides a list of persons authorized to validate deer and elk tags. Those classifications of employees of various governmental and non-governmental employers presumes some form of accountability since the authorization is granted as a condition of their employment. There is a presumption that the employees will exercise that authority in accordance with regulation.

Under existing regulation, a certain classification of firefighter is authorized to countersign tags. Section 708.6(c)(1)(C)1. describes them as “County Firemen at and above the class of foreman”. Outside of Department of Fish and Wildlife employees and offices, fire stations are the most commonly known places for hunters to have game tags countersigned. For that reason, all California Department of Forestry and Fire Protection (CALFIRE) employees, regardless of rank or job duties, are authorized to validate tags.

Since this regulation was adopted (2011) there has been a long standing assumption by the public that all firefighters can countersign game tags regardless of rank, or whether they work for a county, city, or district. Unfortunately, current regulation does not authorize non-county firefighters to validate tags.

## Proposed Amendments to Regulation

- Subsections (a), and (c). The proposed amendments clarify that the authorized persons “countersign” as the required action. Reference to “validation” of the tags is removed. While the terms have been used interchangeably, the Fish and Game Code 4341 (deer) and Section 708.11, Title 14, CCR, (elk) and the license tags themselves all require that the tag be “countersigned”.
- Subsection (b) is deleted and rewritten as (d).
- Subsection (c) is deleted since it is repetitive of the next subsection (c)(1).
- Subsection (c)(1) is renumbered (c).
- Subsections (c)(1)(A), (B), and (C) are renumbered (c)(1), (2), and (3), with minor editorial changes. In (c)(3) the department acronym CALFIRE is added for clarity.
- Subsections (c)(1)(a)4. and 5. the outdated state job titles of Plant Quarantine Inspectors are deleted and replaced with (c)(1)(D) and the current job titles.
- Subsection (c)(1)(C)1. is deleted and changed to (c)(3)(A) adding “Firefighters employed on a full-time basis, only when the deer or elk carcass is brought to their fire station.”
- Subsection (d) is added.
- Authority and Reference. Deletes repealed or unnecessary sections, the remaining sections are more closely related to FGC authority; and making specific those provisions related to the subject of regulating deer and elk tags.

## Department Recommendation

The Department believes it is reasonable to expand the category of firefighter that can countersign game tags by amending the subsection to describe them as “firefighters employed on a full-time basis”. Describing them as firefighters updates the outdated use of the term “firemen” and expands the classification of ranks to include all firefighters employed on a full-time basis. It continues to exclude volunteer firefighters who may not have the same level of accountability as full-time firefighters which is consistent with current regulation. It maintains existing regulatory requirements that the authority be granted only to deer and elk brought to a fire station.

Wildlife managers and law enforcement officers from the Department believe expanding the authority to countersign tags to include all firefighters will make it easier for the public to follow the law and increase the number of reliable witnesses in the event of an investigation of poaching.

(b) Goals and Benefits of the Regulation:

Wildlife managers and law enforcement officers from the Department believe expanding the authority to countersign tags to include all firefighters will make it easier for the public to follow the law and increase the number of reliable witnesses in the event of an investigation of poaching.

(c) Authority and Reference Sections from Fish and Game Code for Regulation:

Note: Authority cited: Sections 200, 203, 332, and 4331, Fish and Game Code.

Reference: Sections 332, 4302, 4330, 4333, 4336, 4340, and 4341, Fish and Game Code.

(d) Specific Technology or Equipment Required by Regulatory Change: None.

(e) Identification of Reports or Documents Supporting Regulation Change:

A regulation change petition was submitted to the California Fish and Game Commission in October of 2016 – labeled 2016-028. The author of the petition, Sean Campbell, a firefighter who had been countersigning tags for 30 years, stopped providing this public service because there was confusion over the term “foreman”. Members of his fire department wanted to stay in strict compliance with the regulation and the petition was submitted to the Commission requesting clarification.

(f) Public Discussions of Proposed Regulations Prior to Notice Publication:

The regulation change proposal was reviewed by the Wildlife Resources Committee on September 20, 2018 and garnered no public opposition.

IV. Description of Reasonable Alternatives to Regulatory Action

(a) Alternatives to Regulation Change: None.

(b) No Change Alternative:

The regulation would remain the same authorizing county firemen to countersign but excluding other firefighters, which has caused problems with the public who assume their local fire department can perform this task.

V. Mitigation Measures Required by Regulatory Action

The proposed regulatory action will have no adverse impact on the environment; therefore, no mitigation measures are needed.

## VI. Impact of Regulatory Action:

The potential for significant statewide adverse economic impacts that might result from the proposed regulatory action has been assessed, and the following initial determinations relative to the required statutory categories have been made.

- (a) Significant Statewide Adverse Economic Impact Directly Affecting Businesses, Including the Ability of California Businesses to Compete with Businesses in Other States:

The proposed action will not have a significant statewide adverse economic impact directly affecting business, including the ability of California businesses to compete with businesses in other states. The proposed action expands the list of authorized firefighters able to perform a service for the public.

- (b) Impact on the Creation or Elimination of Jobs Within the State, the Creation of New Businesses or the Elimination of Existing Businesses, or the Expansion of Businesses in California; Benefits of the Regulation to the Health and Welfare of California Residents, Worker Safety, and the State's Environment:

The proposed regulation will not result in the creation or elimination of jobs within the state, cause the creation of new businesses or the elimination of existing businesses or result in the expansion of businesses in California, because it only expands the list of authorized firefighters able to perform a service for the public.

The Commission anticipates benefits to the health and welfare of California residents. Hunting provides opportunities for multi-generational family activities and promotes respect for California's environment by the future stewards of the State's resources. The Commission anticipates benefits to the State's environment in the sustainable management of natural resources, these provisions provide other opportunities for the public to comply with the regulation of hunting.

- (c) Cost Impacts on Representative Private Persons/Business:

The Commission is not aware of any cost impacts that a representative private person or business would necessarily incur in reasonable compliance with the proposed action.

- (d) Costs or Savings to State Agencies or Costs/Savings in Federal Funding to the State:

The proposed action will have no statewide economic or fiscal impact because the proposed action would implement a Departmental administrative process to increase efficiency that will only affect the work tasks of Department and Commission staff.

- (e) Other Nondiscretionary Costs/Savings to Local Agencies: No nondiscretionary costs are passed on to local agencies (city, district, or county fire departments) since the authorized action of countersigning the deer or elk tag is entirely discretionary to the local firefighter and department. No costs have been associated with the occasional public request to have a tag countersigned by the listed public officials.
- (f) Programs Mandated on Local Agencies or School Districts: None.
- (g) Costs Imposed on Any Local Agency or School District that is Required to be Reimbursed under Part 7 (commencing with Section 17500) of Division 4: None.
- (h) Effect on Housing Costs: None.

VII. Economic Impact Assessment:

The proposed action will have no statewide economic or fiscal impact because the proposed action would implement a Departmental administrative process to increase efficiency that will only affect the work tasks of Department and Commission staff. The proposed alternative process to set big game tag quotas would reduce the annual regulatory workload, and permit both the Commission and the Department to devote staff resources to achieve other core missions.

- (a) Effects of the regulation on the creation or elimination of jobs within the State:

The regulation will not affect the creation or elimination of jobs because the proposed action does not change the level of hunting activity in California.

- (b) Effects of the regulation on the creation of new businesses or the elimination of existing businesses within the State:

The regulation will not promote the creation of new businesses or the elimination of businesses within the State because the proposed action does not change the level of hunting activity in California.

- (c) Effects of the regulation on the expansion of businesses currently doing business within the State:

The regulation will not affect the expansion of businesses currently doing business in the State because the proposed action does not change the level of hunting activity in California.

- (d) Benefits of the regulation to the health and welfare of California residents:

The Commission anticipates benefits to the health and welfare of California residents. Hunting provides opportunities for multi-generational family activities and promotes respect for California's environment by the future stewards of the State's resources.

- (e) Benefits of the regulation to worker safety:

The proposed regulation would not affect worker safety.

- (f) Benefits of the regulation to the State's environment:

It is the policy of the State to encourage the conservation, maintenance, and utilization of the living resources. The Commission anticipates benefits to the State's environment in the sustainable management of natural resources, these provisions provide other opportunities for the public to comply with the regulation of hunting.

## Informative Digest/Policy Statement Overview

Critical to the management of California's game populations is the countersigning requirement of deer and elk tags by an authorized person who physically signs their name to the tag attached to the deer or elk carcass. In subsection 708.6(c), Title 14, CCR, Deer and Elk Tags, Persons Authorized to Validate, it is necessary to clarify for the public and law enforcement that "firefighters employed on a full-time basis" are authorized to countersign, an addition to the other authorized persons found in 708.6(c). Part time, volunteer, or other fire station personnel are not included and cannot sign the tag. The added text maintains the existing regulatory requirement that the countersigning may be done only for deer and elk brought to a fire station.

Wildlife managers and law enforcement officers from the Department believe expanding the authority to countersign tags to include all firefighters will make it easier for the public to follow the law and increase the number of reliable witnesses in the event of an investigation of poaching.

The amendment also clarifies that the authorized persons "countersign" as the required action; corrects outdated state job titles of Plant Quarantine Inspector; clarifies that the provisions apply both to deer and elk tags; and other minor editorial changes.

### Non-monetary Benefits to the Public

The Commission anticipates benefits to the health and welfare of California residents through the sustainable management of mammal populations. The Commission does not anticipate non-monetary benefits to worker safety, the prevention of discrimination, the promotion of fairness or social equity and the increase in openness and transparency in business and government. The Commission anticipates benefits to the State's environment in the sustainable management of natural resources, these provisions provide other opportunities for the public to comply with the regulation of hunting.

### Consistency and Compatibility with Existing Regulations

The Commission has reviewed its regulations in Title 14, CCR, and conducted a search of other regulations on this topic and has concluded that the proposed amendments to Section 708.6 are neither inconsistent nor incompatible with existing State regulations. No other State agency has the authority to promulgate hunting regulations.

## Proposed Regulatory Language

Section 708.6 is amended to read:

### **§ 708.6. Tag ~~Validation~~, Countersigning and Transporting Requirements.**

(a) Any person legally killing a deer in this state shall have the deer license tag ~~validated and~~ countersigned by a person authorized by the commission as described ~~below~~ in subsection (c) before transporting such deer, except for the purpose of taking the deer to the nearest person authorized to countersign the license tag, on the route being followed from the point where the deer was taken (refer to Fish and Game Code, Section 4341).

~~(b) No person may validate or countersign his/her own deer tag or tag.~~

(b) Any person legally killing an elk in this state shall have the elk license tag countersigned by a person authorized by the commission as described in subsection (c) before transporting such elk, except for the purpose of taking the elk to the nearest person authorized to countersign the license tag, on the route being followed from the point where the elk was taken.

~~(c) Deer and Elk Tags, Persons Authorized to Validate Countersign.~~

~~(1)(c)~~ The following persons are authorized to ~~validate or~~ countersign deer and elk tags:

~~(A)(1)~~ State:

~~1.(A)~~ Fish and Game Commissioners

~~2.(B)~~ Employees of the Department of Fish and ~~Game~~ Wildlife, including Certified Hunter Education Instructors

~~3.(C)~~ Employees of the California Department of Forestry and Fire Protection (CAL FIRE)

~~4.~~ Supervising Plant Quarantine Inspectors

~~5.~~ Junior, Intermediate and Senior Plant Quarantine Inspectors

(D) Plant Quarantine Inspector, Supervisor I, and Supervisor II

~~(B)(2)~~ Federal:

~~1.(A)~~ Employees of the Bureau of Land Management

~~2.(B)~~ Employees of the United States Fish & Wildlife Service

~~3.(C)~~ All Uniformed Personnel of the National Park Service

~~4.(D)~~ Commanding Officers of any United States military installation or their designated personnel for deer or elk taken on their reservation.

~~5. (E) Postmasters & Post Office Station or Branch Manager for deer or elk brought to their post office.~~

~~(C) (3) Miscellaneous:~~

~~1. County firemen at and above the class of foreman for deer brought into their station.~~

(A) Firefighters employed on a full-time basis, only when the deer or elk carcass is brought to their fire station.

~~2. (B) Judges or Justices of all state and United States courts.~~

~~3. (C) Notaries Public~~

~~4. (D) Peace Officers (salaried & non-salaried)~~

~~5. (E) Officers authorized to administer oaths~~

~~6. (F) Owners, corporate officers, managers or operators of lockers or cold storage plants for deer or elk brought to their place of business.~~

(d) No person may countersign his/her own deer tag or elk tag.

Note: Authority cited: Sections 200, 202, 203, 215, 219, 220, 332, 1050, 1572, 4302, and 4331, 4336, 4340, 4341 and 10502, Fish and Game Code. Reference: Sections 200, 201, 202, 203, 203.1, 207, 210, 215, 219, 220, 332, 1050, 1570, 1571, 1572, 3950, 4302, 4330, 4331, 4332, 4333, 4336, 4340, and 4341, 10500 and 10502, Fish and Game Code.

**Commissioners**  
**Eric Sklar**, President

Saint Helena

**Jacque Hostler-Carmesin**, Vice President  
McKinleyville

**Russell E. Burns**, Member  
Napa

**Peter S. Silva**, Member  
Jamul

**Samantha Murray**, Member  
Del Mar

STATE OF CALIFORNIA  
Gavin Newsom, Governor

## Fish and Game Commission



Wildlife Heritage and Conservation  
Since 1870

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March 22, 2019

### TO ALL INTERESTED AND AFFECTED PARTIES

This is to provide notice that the proposed regulatory actions relative to "Mammal Hunting Regulations" in section 362, 364, 364.1 and 708.6, identified in Title 14, California Code of Regulations, which appeared in the California Regulatory Notice Register on January 11, 2019, may be continued to the Commission's teleconference meeting on May 16, 2019.

The purpose of the continuation is to allow for additional public review of associated California Environmental Quality Act (CEQA) documents for bighorn sheep and elk (SCH #s 2018112036 and 2018112037) as filed with the State Clearinghouse on February 19, 2019. Please note that information in the original notice remain the same, including regulatory text, associated documents and noticed dates of the public hearings related to this matter.

At the Commission's April 17, 2019 meeting in Santa Monica, staff will recommend continuing public review of the CEQA documents for bighorn sheep and elk.

**NOTICE IS NOW GIVEN** that, if the staff recommendation to continue public review of the CEQA documents for bighorn sheep and elk is approved, any person interested may present statements, orally or in writing, relevant to the proposed regulatory actions at the Commission's teleconference hearing on Thursday, May 16, 2019, at 8:00 a.m., or as soon thereafter as the matter may be heard, in the Commission's conference room, 1416 Ninth Street, Room 1320, Sacramento, California or at one of three California Department of Fish and Wildlife (CDFW) offices: Arcata Field Office, 5341 Ericson Way, Arcata, CA 95521, CDFW Fairfield Regional Office, 2825 Cordelia Road, Suite 100, Fairfield, CA 94534, and CDFW San Diego Regional Office, 3883 Ruffin Road, San Diego, CA 92123.

Written comments are requested before the April 17, 2019 meeting; however, to be considered during preparation of the adoption hearing materials, comments should be submitted no later than May 3, 2019, at the address given below, or by email to [FGC@fgc.ca.gov](mailto:FGC@fgc.ca.gov). Any written comments mailed or emailed to the Commission office must be received before 12:00 noon on May 10, 2019 after which any comments must be received at the May 16, 2019 teleconference hearing. If you would like copies of any modifications to this proposal, please include your name and mailing address in your correspondence. Mailed comments should be addressed to California Fish and Game Commission, PO Box 944209, Sacramento, CA 94244-2090.

Sincerely,

Jon D. Snellstrom  
Associate Government Program Analyst