Meeting Report
Wolf Conservation Stakeholder Subgroup
June 17, 2014

CDFW Wildlife Branch
Conference Room
1812 9th Street
Sacramento, CA 95811

Photo courtesy of Bruce Bohlander

California Department of Fish and Wildlife

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1.0 Introduction

On June 17, 2014 the Wolf Conservation Subgroup (WCS) of the California Wolf Stakeholder Working Group (SWG) convened in the Conference Room of the California Department of Fish and Wildlife's Wildlife Branch office. This was the sixth meeting of the WCS, which was established to help the California Department of Fish and Wildlife (CDFW, Department) develop a consensus-driven framework of strategies for wolf conservation and management in California.

2.0 Meeting Objectives and Mechanics

The purpose of the meeting was to continue discussion of potential topics for inclusion in a Wolf Conservation chapter in the California Wolf Plan.

Objectives of the meeting as initially planned were:

- Discuss CESA listing implication for the SWG and Wolf Plan
- Continue development of Conservation chapter with focus on operating assumptions

The meeting was attended in person by the meeting facilitator Sam Magill, seven stakeholders, and five CDFW staff, with one additional stakeholder attending via conference line. Appendix A provides a list of participants, their affiliations, and their contact information. In addition, one legislative representative attended via conference line. Appendix B provides that individual's name, affiliation and contact information. Appendix C contains the meeting agenda.

3.0 Meeting Outputs

Updates/Housekeeping

- Ms. Amaroq Weiss will present the Conservation Subgroup's update at the June 25 SWG meeting
- Edits suggested for the May 27 Conservation Subgroup meeting report included:
    - The second bullet on page 6 should say 6 breeding pairs
    - An error on page 6 under general discussion should say "non-zonal"
- The next Conservation Subgroup meeting was scheduled for July 21st from 1-4pm in Redding.

Discuss CESA Listing Implications

The California Fish and Game Commission decided at their June 4, 2014 meeting in Fortuna, to list the gray wolf as endangered under the California Endangered Species

Act. To discuss some implications of this action, Mr. Stopher displayed the California Wolf Plan Scenarios document (see slide 2 of Appendix F) which was developed for a past meeting to list for the stakeholders what management components the Department would be responsible for under various wolf listing scenarios. The scenarios most relevant to the Department today are those in which the species is listed under both the federal (ESA) and state (CESA) Endangered Species Acts (Scenario II), and in which the species is listed under CESA and – because it has been proposed by the U.S. Fish and Wildlife Service – delisted under ESA (Scenario IV). Mr. Stopher reminded the group that as long as wolves remain listed under ESA, the federal Act takes precedence over any strategies that the Department develops, however the plan should include strategies that can be implemented upon federal delisting, and upon possible statutory updates in California that address wolves.

The suggestion for statutory changes to address wolves derived from the fact that there are no specific regulations pertaining to wolf management in California due to the species' long absence from the state. One stakeholder suggested that a statutory framework does exist for mountain lions which addresses concerns for native ungulates[1], livestock, and human safety, and that this may be a good starting point for considering language for wolf regulations.

Other questions/comments from stakeholders included the following:

- The last Wildlife Resources Committee was discussing reorganizing predator regulations; is this still being discussed and could this be tied in with adding wolf-related language?
- Does the listing under CESA imply an obligation for the Department to recover wolves?
- How will California Environmental Quality Act (CEQA) come into play relative to wolf listing?
- We should put strategies into our plan that account for the potential loss of federal protections in the event that they delist under ESA.

In terms of updating predator regulations, Department staff acknowledged that they are outdated and no longer reflect how the public and the Department value predators, however updating would require significant effort. In terms of recovery, Department staff explained that CESA does not require the development of a recovery plan for listed species, but it establishes an obligation to conserve them. With respect to CEQA, the listing of wolves invokes the thresholds of significance under a CEQA analysis, in that it focuses attention on the numbers and distribution of listed species, and requires

[1] Fish and Game Code section 4801 restricts this to "an imminent threat to the survival of any threatened, endangered, candidate or fully protected sheep species".

mitigation for impacts found to be potentially significant. For wolves the only impacts that have reached that level of concern was when a project has affected a den or rendezvous site.

Review/Discuss Chapron Paper

The paper by Chapron et al. 2003, titled "Conservation and control strategies for the wolf (*Canis lupus*) in western Europe based on demographic models" was presented for discussion at a previous meeting. It was of interest because of its comparison of zonal versus adaptive (non-zonal) approaches to wolf management and their implications to wolf conservation. Today Mr. Stopher summarized the paper for the group by defining the terms "zone" and "adaptive management" as used by Chapron et al. 2003; listing the parameters used by the authors to develop a sensitivity model for wolf extinction under the two management approaches; displaying the results of the model under different scenarios; and listing the key findings of the study (see slides 3 – 7 of Appendix F). Mr. Stopher stressed that the most important key finding is the importance of the alpha individuals to the viability of the population. Any long-term goals for wolf conservation will require an understanding of these characteristics and a nuanced approach to management. In addition, an management strategy that would include lethal take may also likely require a larger population of wolves if their long-term viability is to be maintained.

Review/Discuss Utility of Population Viability Analysis and Minimum Viable Population for California's Wolf Plan

This portion of the meeting involved discussing the topics of minimum viable population (MVP), and population viability analysis (PVA). MVP "for any given species in any given habitat is the smallest isolated population having a 99% chance of remaining extant for 40 generations[2] despite the foreseeable effects of demographic, environmental, and genetic stochasticity, and natural catastrophes." Other criteria are used by other researchers. The related PVA is a species-specific method of risk assessment used to determine the probability that a population will go extinct within a given number of years. Some stakeholder members submitted papers on these topics out of concern that the Department use scientific methods for determining appropriate population objectives for wolves. Mr. Stopher explained that these approaches are useful for general planning purposes, but that they do have some limitations. For example, assumptions made by one author [3] were that there would be no loss of habitat during the projected timeframe, and that individual populations are discrete and isolated. While these assumptions may be true for some species, they are not true in the case of wolves. Mr. Stopher reminded

[2] Reed et al., 2003.
[3] Ibid.

the group of one of the group's operating assumptions, which is that a California wolf population will be connected to Oregon's population, and which is in turn connected to populations in other states, so estimating a minimum viable population for California may not be necessary, useful or valid.

Review/Discuss Revised Operating Assumptions

The version of the Operating Assumptions document (Appendix D) presented at today's meeting was updated from the prior version to include the following changes:

- Number 14 is a new assumption
- Seven items were added as points from "Wolf Population Dynamics" by Fuller, Mech, and Cochrane (2003)

Stakeholder comments and questions included:

- Do we know for certain that management in Oregon won't change significantly during the 15 years of our phase 1?
- Consider adding language to reflect the likelihood that wolf packs whose territories span the border with Oregon may be impacted by Oregon's wolf management policies
- Add language to reflect the different human, agricultural, and wildland densities in California as compared to other western states
- Remove the word "currently" from item 17 as it implies a plan to change

General Discussion on Alternative Strategies

This document (Appendix E) was developed from a discussion at the last meeting, in which two alternative approaches for Phase 1 were proposed: dividing California into zones, each with its own set of wolf population objectives and incorporating adaptive management; or wolf population objectives for the state as a whole and incorporating adaptive management. Parameters for concluding Phase 1 under each approach were incorporated into a table for ease of comparison, and were presented today for discussion. Planning for Phase 2 would begin when the state has 3 successful breeding pairs or on January 1, 2027, whichever comes first.

Questions/comments included:

Why choose goals for changing management strategies, i.e. moving into Phase 2, in such a short time/low population threshold?

- *The choice of figures for population objectives/timeframe are based on the Oregon's experience. That is, the Oregon population reached six successful breeding pairs approximately fifteen years after wolves were documented in*

the State. For various reasons, establishment of wolves in California will likely take somewhat longer to reach similar population levels.

Under lethal control for management it says “primarily for chronic livestock depredation.” What other purposes might there be for using lethal control?

- *If a small wild ungulate population is being heavily impacted by wolves the Department could consider taking such management actions*

Do we need another column in this table to consider the implications to the Department for each approach; e.g. costs for each?

- *Excellent idea*

Conclusion

The meeting concluded with discussion about due dates for comments on today’s documents, and for questions pertaining to implications of wolf listing by the Fish and Game Commission, which will be presented for discussion at next week’s full SWG meeting.

Action Items:

- Identify questions that arise from the CESA listing for an FAQ (due to Sam Magill by Friday, June 20).
- Send comments on the Alternative Conservation Approaches table to Mark Stopher by Friday, July 11th.

APPENDIX A
WORKSHOP PARTICIPANTS

Name	Affiliation	Email
Stakeholders		
Noelle Cremers	California Farm Bureau	ncremers@cfbf.com
John McNerney	The Wildlife Society – Western Section	jmcnerney@cityofdavis.org
Jerry Springer	CA Deer Association	jerry@westernhunter.com
Lesa Eidman	CA Woolgrowers Assn	lesa@woolgrowers.org
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Damon Nagami	Natural Resources Defense Council	dnagami@nrdc.org
Pamela Flick	Defenders of Wildlife	pflick@defenders.org
California Department of Fish and Wildlife Staff		
Karen Converse	Environmental Scientist – Lands Program	karen.converse@wildlife.ca.gov
Mark Stopher	Senior Policy Advisor – CDFW	mark.stopher@wildlife.ca.gov
Karen Kovacs	Wildlife Program Manager – Region 1	karen.kovacs@wildlife.ca.gov
Eric Loft	Wildlife Branch Chief	eric.loft@wildlife.ca.gov
Erin Reddy	Scientific Aid	erin.reddy@wildlife.ca.gov

APPENDIX B
PUBLIC PARTICIPANTS AND COMMENTS

Legislative Representatives		
Name	**Affiliation**	**Email**
Catherine Bird	Senator Ted Gaines's Office	catherine.bird@sen.ca.gov

No comments were offered

APPENDIX C - AGENDA

Conservation Objectives Subgroup
9-12 June 17, 2014
Conference Room, 1812 Ninth Street, Sacramento
Teleconference Line 888-379-9287, Participant Code: 476990

PROPOSED AGENDA

Objectives:

- Discuss CESA listing implication for the SWG and Wolf Plan
- Continue development of Conservation chapter with focus on operating assumptions

1. Introductions and Logistics (5 minutes)

2. Updates/Housekeeping (10 minutes)
    a. Identify Stakeholder member for update at next SWG meeting
    b. Review, discuss, and revise May 27 meeting report
    c. Discuss Conservation Objectives Subgroup Scheduling

3. Discuss CESA listing implications (15 minutes)
    a. DFW perspective on listing
    b. Implications of listing on Plan development

4. Review/discuss Chapron paper provided May 14 for implications regarding management units and population objectives. (20 minutes)

5. Review/discuss utility of Population Viability Analysis and Minimum Viable Population Size for CA Wolf Plan (20 minutes)

6. BREAK (5 minutes)

7. Review and Discuss revised operating assumptions for CA wolf conservation planning (60 minutes)

8. General discussion and feedback on alternative strategies provided by CDFW (30 minutes)

9. Public questions (10 minutes)

10. Wrap up and action item review (5 minutes)

APPENDIX D
OPERATING ASSUMPTIONS FOR
CA WOLF CONSERVATION PLANNING (06-16-2014)

Operating Assumptions for CA Wolf Conservation Planning – near term (now through 2030)

1. As a wolf population becomes established in CA, we can expect a continued exchange of individual animals with the Oregon population
2. Net positive immigration from Oregon into California is likely over the near term.
3. Management practices in Oregon, with respect to wolves will change little during this period
4. Oregon population data reflect recent annual wolf population growth in that state
    - 2010 50%
    - 2011 38%
    - 2012 58%
    - 2013 39%
5. Immigration from Idaho will be become an increasingly less important contributing mechanism for growth in Oregon's wolf population over time, compared to intrinsic growth based on reproduction in Oregon wolf packs.
6. When wolf packs become established in CA their distribution will generally be based on these factors:
    1. Positively correlated with:
        1. proximity to Oregon
        2. higher wild ungulate density (particularly with respect to elk)
        3. with higher forest cover
    2. Negatively correlated with:
        1. human density
        2. domestic livestock density
        3. non-forested rangeland and intensively managed agricultural lands
        4. road density
7. Existing information is not sufficient to confidently estimate the long-term carrying capacity for wolves in CA
8. Existing information is sufficient to predict those geographic areas most likely to provide suitable habitat for wolf packs in the near term
9. Due to the absence of large refugial areas, mix of public and private lands, relatively low elk populations, fragmented habitat, restricted sources for immigration and reliance on natural dispersal for initial recruitment into CA, the wolf population in CA is likely to grow at a slower rate than observed to date in OR or WA.
10. The extent to which wolf populations can or will establish in areas where mule deer are the primary wild ungulate prey, in CA, is unknown.
11. For the same reasons listed in #9, the wolf population is likely to be smaller, both in the near and long-term than in Oregon or Washington
12. Table 4, Chapter 3, in the WA Wolf Plan reflects a reasonable projection for planning purposes of the relationship between wolf numbers, packs and successful breeding pairs.
13. Based on the OR experience, and assumption that CA wolf population will grow relatively more slowly, the near term population of wolves in CA wolf will likely not exceed 6 successful breeding pairs.

14. In the near-term, the CA wolf population will become established by immigration and will then grow though both continued immigration and reproduction.
15. Based on OR and WA experience:
    1. We should expect that successful breeding pairs will become established in southern OR before CA.
    2. It's unlikely that we will see near-term immigration into CA from NV
16. The NRM wolf population was established by translocation, which will not occur in CA. Therefore the rates of population growth in WY, MT and ID are not useful as examples we should expect to occur in CA.
17. Sport hunting and commercial trapping of wolves by private entities is currently not lawful in CA.

Points from "Wolf Population Dynamics" by Fuller, Mech and Cochrane, 2003.

1. Wolf density is mostly explained by the availability of prey. More specifically, by "vulnerable prey". In California the existing ungulate fauna is not equally vulnerable. For example, wolves rarely kill pronghorn antelope. Elk, where they exist are vulnerable to wolf predation, but elk numbers are (relatively) low in California and distributed unevenly. Mule deer are widely distributed. Wolves certainly kill and eat mule deer but wolves in other western states prefer elk and have generally not occupied habitat, or are present in low densities, where they rely primarily on mule deer.
2. Wolf packs occupy territories which are defended against other wolves. Prey density and territory size are inversely correlated. That is, where prey density is low, territories are larger, and those territories are defended against other wolves.
3. Wolf pup survival is directly related to prey biomass.
4. Where wolves are persecuted by humans they do not survive where road densities exceed 1 km/sq. km.
5. Wolf populations have a very high intrinsic potential to increase and are resilient to high rates of mortality, including that caused by humans. Numerous studies document sustainable populations where mortality ranged between 20 and 50% annually. In one study from Quebec, annual human caused mortality of wolves was reported as 74%. The wolf population was stable and was probably augmented by immigration. The National Research Council concluded that wolf control is likely to be successful only if, "wolves are reduced to at least 55% of the pre-control numbers for at least 4 years". The two main sources of natural wolf mortality are starvation and wolves killing other wolves, both of which are density dependent. Human caused mortality can compensate for some natural mortality.
6. Mortality impacts on wolf population productivity will vary depending on which wolves die. Mortality of pups, juveniles, post-reproductive and dispersing animals will have less effect than the death of the alpha animals.
7. The authors of this paper conclude that PVA models for wolves have "proved unsatisfactory or misleading". Since estimates of MVP depend on PVA models, this suggests the science is not yet very useful for predicting a California MVP.

APPENDIX E
PHASE 1 ALTERNATIVE CONSERVATION APPROACHES, OBJECTIVES AND MANAGEMENT CONCEPTS (06-12-2014)

Phase 1 Alternative Conservation Approaches, Objectives and Management Concepts

	Zone Adaptive Management Approach	**Statewide Adaptive Management Approach**
Parameters for Concluding[1] Phase 1	• Through December 31, 2030, or • Three successful breeding pairs in Zone 1 for two successive years, and • Three successful breeding pairs in Zone 2 for two successive years	• Through December 31, 2030, or • Six successful breeding pairs anywhere in CA, for two successive years
Landscape Distinctions	Zone 1 – (aka Northwest)– bounded by I-5 on the east and I-80 on the south Zone 2 – (aka Northeast) bounded by I-5 on the west and I-80 on the south Zone 3 - Balance of state	Entire state
Lethal control for human safety	Allowed when authorized by CDFW and carried out by CDFW or its agent. No limit on how many wolves can be removed for public safety[2].	Same
Use of lethal control for management (if authorized by statute). Primarily for chronic livestock depredation when non-lethal methods have been implemented and are not effective. Allowed when authorized by CDFW and carried out by CDFW or its agent. Any human caused mortality[3] counts against any established limit.	Managed by individual zone 1. For Zone 1 or 2, allowed when the zone population increased by at least 5% and included three successful breeding pairs in the preceding year 2. Capped at 10% of the minimum number of wolves documented in specific zone, the previous year, but not to exceed two animals total in any year/zone 3. Restricted to animals in packs confirmed by CDFW to have depredated livestock 4. For control of livestock depredation, no killing of alpha male or female 5. Not allowed in Zone 3	Managed over the entire state 1. Allowed when the zone population increased by at least 5% and included five successful breeding pairs in the preceding year 2. Capped at 10% of the minimum number of wolves documented in previous year 3. Restricted to animals in packs confirmed to have depredated livestock or animals determined by CDFW to present a human safety risk

[1] Commence development of Phase 2 when either: 1. California has three successful breeding pairs, or 2. January 1, 2027; whichever occurs first

[2] Anticipated to be an extremely rare occurrence

[3] Human caused mortality includes public safety take, poaching, vehicle accidents, accidental death from trapping or hunting

APPENDIX F
POWERPOINT SLIDES PRESENTED

Slide 1

Wolf Conservation Subgroup

June 17, 2014

Slide 2

CA Wolf Plan Scenarios

Scenario	Criteria	DFW management components
I (Current Status)	Wolf is listed under Federal ESA Wolf is not listed under CESA	1. Support USFWS in the lead agency / for decisions on wolf management 2. Exercise appropriate FGC authority 3. Develop wolf plan 4. Monitor wolf recovery
II	Wolf is listed under Federal ESA Wolf is also listed under CESA	1. Continue Scenario I actions 2. Enforce CESA authorities • Take Prohibition • Permit Exceptions
III	Wolf is not listed under Federal ESA Wolf is not listed under CESA	1. DFW is lead management agency for wolf 2. Exercise appropriate FGC authority 3. Develop wolf plan 4. Monitor wolf recovery
IV	Wolf is not listed under Federal ESA Wolf is listed under CESA	1. DFW is lead management agency for wolf 2. Exercise appropriate FGC authority 3. Develop wolf plan 4. Monitor wolf recovery 5. Enforce CESA authorities • Take Prohibition • Permit Exceptions
V	Wolf delisted from Federal ESA Wolf is delisted from CESA after meeting standards under FGC 2061	1. DFW is lead management agency for wolf 2. Exercise appropriate FGC authority 3. Monitor wolf recovery 4. Review need to revise wolf plan

Slide 3

Chapron et al, paper

- "Zone" approach means partitioning landscape into areas where wolves will be maintained and areas where wolves will not be allowed to establish.
- Adaptive management means accommodating wolf populations and managing those populations based on population information.

Slide 4

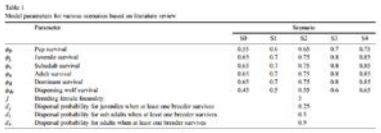

Table 1
Model parameters for various scenarios based on literature review

Parameter	Scenario				
	S0	S1	S2	S3	S4
ϕ_p Pup survival	0.55	0.6	0.65	0.7	0.75
ϕ_j Juvenile survival	0.65	0.7	0.75	0.8	0.85
ϕ_s Subadult survival	0.65	0.7	0.75	0.8	0.85
ϕ_a Adult survival	0.65	0.7	0.75	0.8	0.85
ϕ_d Dominant survival	0.65	0.7	0.75	0.8	0.85
ϕ_{dg} Dispersing wolf survival	0.45	0.5	0.55	0.6	0.65
f Breeding female fecundity			3		
d_j Dispersal probability for juveniles when at least one breeder survives			0.25		
d_s Dispersal probability for sub-adults when at least one breeder survives			0.5		
d_a Dispersal probability for adults when at least one breeder survives			0.9		

Slide 5

Zoned

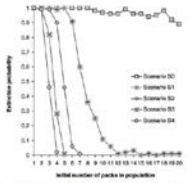

Fig. 5. Extinction probabilities calculated when population (in packs) is prevented for exceeding its initial size. This corresponds to a zoning management strategy.

Under S4, the probability of extinction in 50 years, measured from the point when there are 4 packs, is I in 50 (i.e. 0.02)
Under S1, at least 12 packs are required for approximately the same extinction probability..

Slide 6

Not zoned

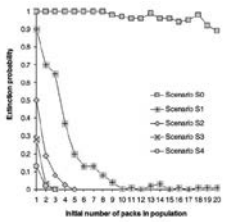

Fig. 4. Extinction probabilities as a function of initial population size (in packs). Carrying capacity is 20 packs.

Extinction probability for S4 is essentially zero for 50 years with 3 packs

Slide 7

Key Findings

- Dominant (alpha) survival is most important to keeping extinction probability low
- Survival of dispersing and non-breeding adults is least important to keeping extinction probability low
- Adaptive management requires current population information
- Wolf populations can be managed while keeping extinction probabilities low
- Extinction probabilities for zoned populations are always higher than those that can disperse

Slide 8

- The Chapron paper is structured as a population viability model using published information, and is not related to a particular landscape.
- It's useful to help understand the relative importance of different population characteristics
- It cannot be used to predict California wolf population viability with any precision.

Slide 9

Phase 1 Alternative Conservation Approaches, Objectives and Management Concepts

Parameters for Concluding Phase 1	• Through December 31, 2030, or • Three successful breeding pairs in Zone 1 for two successive years, and • Three successful breeding pairs in Zone 2 for two successive years	• Through December 31, 2030, or • Six successful breeding pairs anywhere in CA, for two successive years
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Slide 10

Table 4. Range of numbers of packs, lone wolves, and total number of wolves that might correspond to numbers of successful breeding pairs at different recovery stages in Washington.

	Endangered to threatened	Threatened to sensitive	Sensitive to delisted
No. of successful breeding pairs	6	12	15
Estimated equivalent no. of packs	7-17	14-33	17-42
Estimated no. of wolves in all packs combined	36-124	71-241	87-307
Estimated no. of lone wolves	4-22	8-43	10-54
Total estimated no. of wolves present	40-146	79-284	97-361
Total estimated no. of wolves present, using 14 wolves per successful breeding pair	84	168	210

Slide 11