

## Comments by Becky Pierce on Oregon Draft Plan

In reviewing the 2005 Oregon Cougar Management Plan I find several conceptual faults for the justification of the proposed management actions.

1. Calve:cow ratios are repeatedly stated to be a reliable index to the cougar population. This is a false assumption. There is an abundance of numbers provided demonstrating that in some studies cougars are responsible for a large percentage of mortality for both adult and young ungulates. This data is presented in the absence of any data on where those populations were in relation to  $K$  and therefore the impact of cougar predation is completely unknown. In several of the zones it is acknowledged that ungulate populations may have exceeded  $K$  yet increasing ungulate populations is still used as a justification for cougar removal. In one Zone it is proposed that a decline in habitat quality could lead to a decrease in prey numbers and therefore cougars could become a limiting factor needing reduction. This makes no sense.
2. Pages 10 & 11. The citation for Harrison 1989 demonstrating that cougars limited a Sierra Deer population is obscure and unreliable and should be removed. The citation of Wehausen 1996 is inappropriate because cougars in that paper were not implicated in reducing and then limiting bighorn but were hypothesized to have caused a habitat shift: a completely different topic than the one being addressed in that paragraph.
3. It is stated in the document that population is the best indication of herd health. This is false. The adaptive management strategy in relation to determining the effect of cougars on prey populations should include collection of data from the ungulate population. More specifically, all possible life-history characteristics outlined in Table 2.1 of the Cougar Management Guidelines. Anywhere increases in ungulate population numbers is stated as a management goal, the incorporation of information on those characteristics of the ungulate population is a must. Simple calve:cow ratios and predation mortality does not suffice because it tells the manager nothing about the impact of cougar predation on the growth of the prey population in the absence of those life history data.
4. Models are used to determine population numbers, trends and densities. Those models are of questionable reliability. There is no sensitivity analysis reported for the models used in the document. As pointed out by the authors, models are only as good as the data put into them. What was the quality of bounty data from 1924? Deterministic models should only be used over short time periods. Density estimates are strongly inversely related to study area size and should not be extrapolated over large areas. Harvest and non-hunter take are notoriously bad indices to population size yet this document relies heavily on those data for population estimates.

5. The density estimates provided are surprisingly high. As the authors point out, a cougar population subjected to a large removal has the ability to rebound in a matter of several years. This suggests that cougar populations can grow to  $K$  fairly quickly, yet we are led to believe that there has been a steady increase in cougar numbers in Oregon since 1961. It seems more plausible that increases in cougar/human interactions is a result of other factors and is not a good index to cougar population size. Harvest as mentioned in #4 is also a poor index.
6. Research suggests that high harvest levels can disrupt the social structure of cougar populations by affecting the age distribution. High harvest can lead to an abundance of younger animals, possibly more prone to depredation and likely to tolerate higher densities. Increases in harvest levels may be a result of this as pointed out the average age of animals has declined in those areas.
7. Protection of kittens is mentioned as a management goal but no action describes how that would occur.
8. There is little evidence that sport hunting decreases human/cougar interactions and it is unlikely that the management strategy outlined in the document will lead to the stated management goals.
9. I see nowhere in the document recognition that population fluctuation of both ungulate and carnivore populations is the norm. A range of MOs that incorporate changes in annual weather conditions, habitat changes, and hunter effort might be more realistic as management goals.

There are a number of locations where Zone A is referred to although it is not the Zone being discussed. It appears that the authors cut and pasted sections and forgot to change descriptions, locations and the Zone title.

This plan in its current form relies far too heavily on harvest and depredation numbers. It makes poor assumptions about the relationship of predation to ungulate population health and growth while ignoring other factors. While cougar harvest may be the only tool available for managers this plan relies far too heavily on cougar harvest to meet objectives that may not be realistic or may not be affected very strongly by cougar harvest levels.