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Review: "Feasibility Assessment.... Sierra Nevada"
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It was difficult to review this document, largely because it falls so short of the goals of (1) justifying whether a reintroduction is a necessary conservation action and -- if the answer is yes, (2) deciding where the best location should be. There is no attention to whether reintroduction is an advisable alternative, compared to other alternatives. Then, as if reintroduction is a *fait accompli*, the document assumes another *fait accompli*: that the reintroduction should occur on one particular ownership, without evaluating the suitability of other ownerships. Forcing the reintroduction to occur at a location that is of substantially poorer predicted suitability than others seems short-sighted and irresponsible. The lives of the animals that will be released – and the future of subsequent, scientifically credible reintroduction efforts – are jeopardized by allowing a private landowner dictate to the government the terms of the reintroduction. In short, I strongly recommend expanding the process to: (1) evaluate the value of reintroduction compared to other tools for fisher conservation in the Sierra, and (2) if reintroduction is the consensus, then to consider *all* lands in the unoccupied zone for their suitability as an experimental release location. Furthermore, I think this expanded process must be coordinated with the comprehensive guidance being developed by the Fisher Biology Team, a group of state and federal agency representatives from CA, OR, WA and British Columbia, of which USFWS (Finley) and CF&G (Burkett) are also members. I suspect that the proposal outlined in the current document may be in variance with forthcoming guidance on reintroduction provided by the Fisher Biology Team, and the two may need to be reconciled.

1. Is reintroduction the preferred conservation option?

Where is the justification that suggests that fishers will not colonize this gap naturally over time? Where is the analysis that examines the habitat connectivity in the region of the 'edges' of the currently occupied areas? Where is the discussion of the nature of geographic ranges, and the fact that no geographic range is ever 100% occupied? The nature of geographic ranges is that they include gaps – unexplored in this document is whether reintroduction is justified to fill the gap. Why does the gap exist? Is reintroduction a valid option when the reason for the distribution gap may not be understood? To paraphrase my colleague, Steve Buskirk: If we allow fishers to colonize distributional gaps from adjacent areas via dispersal, we can reasonably conclude that they find the areas suitable. If, however, fishers are placed in the middle of gaps and provide some monitoring for a few years, what does that tell us? As the document states, on page 20: "An understanding of the connectivity and spatial arrangement of suitable habitat in California is critical to their conservation and necessary to evaluate the suitability of areas considered for reintroduction (Green et al. 2006)." I agree, and have been participating in such an exercise in the southern Sierra as part of the CBI-led fisher

effort. This same sort of exercise should occur in the northern Sierra as a precursor to considering reintroduction.

Transplantation has myriad incumbent risks: putting animals at risk of suffering and premature death, risking introducing diseases, and artificially creating new genetic mixtures in a state where there has, heretofore, been no artificial transplant or removals. The work of Wisely et al. (2004)¹ revealed significant genetic substructure over distances as small as 100 km. Thus, even moving animals from northwestern California to northern Sierra Nevada is a precedent-setting decision that forecloses options for natural dispersal of individuals with locally-adapted genomes. That a transplant of fishers in California is unprecedented makes the absence of justification for transplantation more conspicuous. It is undeniable that reintroduction is a powerful potential tool for the conservation of at-risk species, and it is an option that I think should be considered. The problem is that the document does not justify its use, when compared to alternatives.

2. Less-than-optimal selection of reintroduction location: Landscape suitability.

If the case can be made that reintroduction is justified, logic and the precedent set by most other reintroductions, dictates that it should occur at sites with the best probability of success. The proposed reintroduction plan is in direct conflict with the best available science in this regard. The models of Carroll and Davis et al. identify areas with highest landscape habitat suitability, yet these were not considered. Thus, the proposed project entails unnecessary risks to the individual fishers that will be moved, without justifying how this reintroduction will enhance sustainable fisher populations in California. And, perhaps more detrimental, is the impact that a short-sighted reintroduction effort will have on public opinion when a *bona fide* comprehensive reintroduction plan (should it be justified) is proposed in the future. The document refers to SPI as having ‘offered’ their lands for the reintroduction, but the reader is not told whether other landowners were contacted so that they too could offer their lands for this purpose. Were the owners/managers of land with higher landscape suitability value contacted and did they reject the offer to host a reintroduction?

The reason that SPI ownership is ranked so low in habitat suitability is that the SPI lands, when compared with many other areas, resemble places where fishers are absent more than they resemble places where fishers are present in California. Given that some of this is probably explained by habitat conditions, the model results would suggest that the candidate areas do not have the characteristics necessary to support fishers. These conclusions are based on the development and interpretation of models that are peer-reviewed and published (Davis et al. in press), and that represent the best available science. I, and others, can speculate one way or the other about the accuracy and veracity of these models but there is no available substitute for the systematic collection of field data and scientific analysis and interpretation represented by this work.

¹ Wisely, S. M., S. W. Buskirk, G. A. Russell, K. B. Aubry and W. J. Zielinski. 2004. Phylogeography and genetic diversity of the fisher (*Martes pennanti*) in a peninsular and peripheral metapopulation. *Journal of Mammalogy*. 85:640-648.

Furthermore, the argument (pg. 64) that the Carroll and the Davis et al. models are inappropriate for SPI ownership because they include an abiotic (topographic) predictor is specious. Undoubtedly, the topographic relief predictor was selected because it is correlated with some resource of value to fishers. Our suspicion is that this resource is associated with intact late-successional forests. Because of their inaccessibility, areas with topographic ruggedness have been protected from the most intense and consistent forms of timber harvest. Thus, companies interested in commercial timber harvest probably first acquired lands with the most gentle topography, and they altered forest conditions in these lands much more than forests in the less accessible areas. It is my opinion that this is one of the primary reasons for the relatively lower landscape suitability values on SPI ownership; the gentle topography made making a living cutting timber more profitable, but this could not happen without also reducing predicted habitat value for fishers.

3. No comparison of plot-scale habitat suitability within the unoccupied region.

A comprehensive assessment of candidate reintroduction locations should include evaluation of habitat at multiple scales. The document does a fair job of evaluating relative *landscape* habitat suitability, because it includes in the assessment lands outside SPI ownership. It does not, however, compare plot-level habitat suitability across ownerships. We are provided only plot data from SPI ownership. This is another case where the best available science has not been used. We produced a model that estimates relative habitat suitability at Forest Inventory and Analysis (FIA) plots in the southern Sierra (Zielinski et al. 2006)². Although, unavoidably, this model has not been tested with local data – given that there are no fishers in the region – it is the best available tool to evaluate and compare plot-scale resting habitat value across ownerships. The national FIA program is the best plot-scale metric for comparing plot-level habitat components among potential reintroduction locations. I'd be interested in finding out how many FIA plots are located on SPI ownership.

4. Misleading title and misleading effort.

If the agencies guiding this effort will not make this a comprehensive and credible reintroduction effort then, at the least, the motivations should not be obfuscated. This is not a feasibility assessment for reintroduction of fishers into portions of their historic range. This is an assessment of the best location *among SPI ownership*, which I'm guessing is probably < 25% of the fisher's historical range in the northern Sierra. This document does not explicitly consider the opportunities on the remaining 75%. Truth in advertising calls for including SPI in the title of the document, and including in the introduction a description of what is being considered in the document and what the document is not considering. Thus, it should plainly state that the goal of the enterprise was *not* to find the most suitable areas in the unoccupied area for the experimental release. Stating also, later in the document, that analyses revealed that there are better places than the candidate areas considered, would help the reader understand the shortcomings of the SPI-centric exercise and to contrast it with a comprehensive, fisher-

² Zielinski, W. J., R. L. Truex, J. R. Dunk, and T. Gaman. 2006. Using forest inventory data to assess fisher resting habitat suitability in California. *Ecological Applications* 16:1010-1025.

centric exercise (similar to the feasibility and implementation work conducted by Jeff Lewis and associates in Washington).

5. What about habitat management? What about links to the CCAA?

I did not find in the document a discussion of future plans for the management of timber, or other vegetation treatments, in each of the candidate areas. What assurances does the public have that SPI will protect the reintroduction location from deleterious forms of timber harvest in the near future? Furthermore, if the reintroduction site was on public lands there would be legislative support to protect habitat for fishers; what measures are guaranteed on SPI ownership to assure that the areas into which fishers are transplanted will be managed for their conservation? It makes no sense transplanting a species with published late-seral forest associations into landscapes unless there is also a long-term plan for the management of late-seral habitat components. Where, in this document, are the habitat conservation measures that will support the reintroduction effort?

Furthermore, I think the proposal should include a section that reveals to the reader the regulatory implications of an experimental release on SPI ownership as implied, directly or indirectly, in the CCAA document. It is assumed that the CCAA will provide to SPI legal assurance that their future activities will somehow be protected from new regulation, should the fisher be officially listed. It is my understanding that the CCAA may not apply if fishers do not occur on SPI ownership in the Sierra. Thus, SPI has a strong financial interest in an experimental release, regardless of its outcome. This is another reason why government should be dictating the conditions and location of the experimental release, based on the best interests of the fisher, not a private entity which must consider their best financial interests.

In summary, the document represents a good start down the road of exploring conservation options for fishers in California. It is well written and includes a number of useful analyses. These analyses, however, should be broadened to consider the outcomes when the landscape and plot-level habitat suitabilities of *all* areas in the unoccupied zone, not just SPI ownership, are considered. I would enjoy the opportunity to work with CF&G and USFWS if they choose to use this document as a starting point for a more comprehensive approach that uses all available scientific tools and expertise. Along these lines, I'll share an example of some of the work that could contribute to a more comprehensive approach. I am particularly anxious to continue working with colleagues at the USFWS and HSU to develop a regional habitat model for the eastern Klamath region. Cooperative systematic surveys conducted in this region in 2004 and 2005 have resulted in detection data that can be used to build a regional landscape suitability model. Given the close proximity of this region to the unoccupied zone in the Cascades and northern Sierra, it is likely to identify a set of predictors that may be more applicable to the northern Sierra than the models that have been developed using data from the western Klamath region or southern Sierra. This may result in different, and perhaps better, understanding of potential suitability in the unoccupied zone. This effort dedicated to this project has languished, but expanding the scope of the reintroduction discussion might stimulate the completion of this important new planning tool.