State of California
Department of Fish and Game

M e m o r a n d u m

Date: June 9, 2010

To: John Carlson, Jr.
Executive Director
Fish and Game Commission

From: John McCamman
Director
Department of Fish and Game

Subject: Agenda Item for June 23-24, Fish and Game Commission Meeting Re: PURSUANT TO FISH AND GAME CODE SECTIONS 2075 AND 2075.5 CONSIDERATION AND POSSIBLE ACTION ON THE PETITION AND THE DEPARTMENT'S ONE YEAR STATUS REPORT/RECOMMENDATION ON THE PETITION TO LIST THE PACIFIC FISHER (*Martes pennani*) AS A THREATENED OR ENDANGERED SPECIES AND ADOPTION OF COMMISSION FINDINGS.

On May 5, 2010, the Department of Fish and Game took the unusual step of releasing its February 2010 Status Review of the Pacific fisher for additional scientific review, indicating it would accept comments received by May 28, 2010. (See Fish & G. Code, § 2074.6.) The Department encouraged this review as part of its effort to ensure that the Commission's final listing determination for the species under the California Endangered Species Act (CESA) is based on the best available science. (See also Cal. Code Regs., tit. 14, § 670.1, subds. (f)(2), (g)-(i).) I emphasize at the outset as Department Director that our earlier recommendation remains unchanged by the scientific information received in response to the notice; the Department does not believe based on the best available science that the petitioned action is warranted.

In terms of response to the notice, the Department received 16 letters on or before May 28, 2010. The Department's evaluation and response to the scientific information received in response to the notice is summarized in the table transmitted with this memorandum. The Department will be prepared to discuss the scientific information relevant to the petition at the upcoming Commission meeting on June 23-24, 2010.

A number of the letters received in response to the notice go beyond or have little to do with the best available science related to Pacific fisher. The Department is always interested in hearing concerns about and suggestions regarding improvements to the CESA listing process. The Department, in turn, is a strong proponent of robust policy, scientific, and legal debate. My principal focus here, however, as Department Director, is to provide the Commission with an objective evaluation and a related recommendation based on the best available science. (Fish & G. Code, §§ 700, 2074.6.)

If you have any questions or need additional information, please contact

Sonke Mastrup by telephone at (916) 653-4673.

Attachment(s)

Fisher Status Review

Evaluation of Additional Comments Received on the Scientific Information during the Supplemental Comment Period (ending May 28, 2010).

	SUMMARY OF COMMENT	COMMENTOR	DFG RESPONSE (page numbers in Status Review indicated as shown)
1	The greatest threat is forest management practices that have resulted in the significant alteration or loss of the majority of high quality, suitable fisher habitat.	CSERC	The potential threat from forest management is identified, or inferred, in the review on pages xi, 37, 38, 39, 40, 41, and 65-71. Also, DFG described some of the practices of the past are no longer part of current forest management (e.g., p. xii, 75).
2	Fisher are forest specialists that require late seral forests or late seral forest characteristics (such as habitat for denning, resting, and a dense canopy cover) for survival.	CSERC	The review included findings consistent with this comment, in particular as it relates to late seral forest characteristics (e.g., see p. 19-24)
3	Status review is seemingly contradictory to the hypothesis that the Sierra Nevada gap in fisher occurrence is influenced by timber harvest.	CSERC	Hypotheses about the gap as described in the review, have not been tested. As indicated in the review, trapping is considered the primary reason for the extirpation of fisher from the Sierra Nevada and was the focus of Grinnell et al., Dixon, and Hall's published papers. According to these scientists, the near extirpation of fisher from the Sierra occurred prior to the intense period of modern timber harvesting, including since 1945 and since the 1960-93 period cited by the commentors. Current thinking (e.g., R.Barrett, May 2010) is that even in Yosemite NP, fisher are considered absent north of the Merced River. Note this is despite many decades of protection from timber harvest activities in that area of the park. A test of the hypothesis will be whether current and/or future translocation efforts prove successful in managed landscapes of the northern and possibly the central Sierra Nevada.
4	It is absolutely certain that clearcutting for decades on national forest lands and the targeting of large trees and clearcutting on private forest lands have significantly diminished available prime habitat for fisher.	CSERC	The review agrees that decades of timber harvest have modified forest habitats (pages x, xi, xii, 11, 12, 37-41). What remains unknown however, is whether that history is currently preventing (limiting) fisher populations from increasing or from expanding into historic ranges; or whether it is further depressing the populations. These aspects remains untested scientifically as is indicated in the review on page xv, 37-40.

5	The systematic removal of large snags and the practice of cutting trees before they become large on private lands combine to result in far fewer available large snags and large down logs -- structural attributes that are clearly extensively used by fisher.	CSERC	The review agrees that decades of timber management modified forest habitats and removed snags/down logs (see above response and page 20-24 for attributes). Additionally, change in management direction over the past 2-3 decades at both the state and federal levels have increased protections for snags and associated structural features that fisher rely on. What remains unknown however, is whether a lack of snags is currently preventing (limiting) fisher populations from increasing or expanding into historic ranges. This latter aspect remains untested scientifically.
6	There is substantial evidence to indicate that the fisher has suffered from decades of widespread timber harvesting or the long-term decline in late successional habitat.	CSERC	As described in the review (comments #4 and #5 above), there is substantial evidence to indicate that widespread timber harvesting has occurred. There is not substantial evidence that the fisher population "suffered" because of it. In particular, DFG is not aware of any recent scientific or experimental information to confirm the relationship (cause-and-effect) between the trend in timber harvesting and the trend in fisher populations. This is primarily because there is no information in CA on the trend in populations. DFG also indicates that forest management practices have changed in the past 20-30 years and favorably for the fisher.
7	There have been significant negative cumulative impacts from decades of Forest Service conversion of large, mature forest stands to young tree plantations combined with recent decades of private lumber company eliminating large conifers and large snags. Yet instead of acknowledging the importance of continuous, high quality habitat for the fisher, the Status Review attempts to dismiss the value of habitat for the continued survival for the fisher.	CSERC	Pages 19-24 of the status review describe the habitats necessary for survival of fisher.
8	The Status Review admits that the state's Forest Practice Rules lack specific protections for the fisher. But as shown below, the Status Review authors then diminish the seriousness of those impacts to fisher habitat by discounting the impacts due to a lack of monitoring to PROVE that habitat loss actually harms the fisher.	CSERC	The review describes that FPR lack specific protections for fisher (p. 66), but does not diminish the seriousness of any impacts, however the significance of them are largely unknown; rather, the review describes the significance of such impacts as uncertainties lacking scientific study or monitoring information upon which to draw meaningful conclusions. The review contains discussion of FPRs as well as uncertainties regarding drawing conclusions (e.g., pages xii, xv, 66-74). Even without adequate monitoring data, the review recommends revisions to FPRs (page 82-83) to benefit fisher.

9	The Status Review attempts to claim that use of unsuitable habitat on industrial lands (that may be used by some fishers) is somehow justification for assuming that fishers don't need suitable habitat.	CSERC	Nowhere does the review claim that fisher use unsuitable habitat or infer fisher do not require suitable habitat. Rather, if fisher are using habitats and successfully so, they are considered suitable (e.g., section on Habitat Necessary for survival, threats from timber harvest, and 39, 40, 86). The review focuses on what is considered suitable fisher habitat based on information from recent years that indicates fisher inhabit ranges that previously were not considered suitable or optimal habitat (e.g., privately managed forestlands). Consequently, the range of acceptable habitats is from suitable to optimal; this applies to all species, as the DFG is unaware of any species fortunate enough to have optimal habitats available in their entirety.
10	According to the following research cited other places in the Report, fisher mortality is directly correlated with current timber harvesting practices taking place in fisher habitat.	CSERC	The review (e.g., p. 39) cautions the reader on interpreting the results of a particular study conducted at a localized level. Where fisher were found dead in a particular study does not in itself indicate that the habitat was unsuitable. References indicating fisher use, as well as fisher avoidance, of intensively managed lands indicates the understanding of their impacts is unresolved.
11	There can be no doubt that the fisher would greatly benefit from being listed as a threatened or endangered species under CESA.	CSERC	Comment is related to regulatory actions rather than information on the scientific aspects of the status review.
12	Both populations are at risk for extirpation due to low population size and reduced habitat range. Both are described as vulnerable to stochastic events (especially the southern Sierra Nevada population) such as drought, catastrophic fires, and further habitat loss and fragmentation.	CSERC	Model simulations and some fisher scientists predict risk of extirpation for the fisher, more so in the southern Sierra Nevada population than in northern California. However, it is our understanding that the models do not take into account the current active on-the-ground management and conservation activities for both the fisher as well as the habitats upon which they depend. These changes in management strategies and practices began in the 1940s with the elimination of trapping, and now include changes in management of forest communities on both public and private lands.
13	Even though the fisher was already determined to be deserving of protection in 2004 and current forest management practices are continuing to negatively impact the fisher, the Department is now recommending that designation of the fisher in California as a threatened/endangered is not warranted (page 88).	CSERC	Comment is related to regulatory actions rather than information on the scientific aspects of the status review. The 2004 designation was by the USFWS and included OR and WA where the fisher had essentially been extirpated. That did not (has not) happened in CA. CA fisher population has been considered a source population by some.

14	If the fisher is not listed as a threatened or endangered species under CESA, the motive behind the decision will be clear. One that favors the same outdated forest management (logging) practices that are largely responsible for the need to now protect this species.	CSERC	Comment is related to regulatory actions rather than information on the scientific aspects of the status review.
15	take action to not just encourage voluntary forest management policies to aid the fisher, but that the Commission requires "NO NET LOSS" of suitable fisher habitat on private timberlands of the State (as 37% of fisher range is privately owned (page 16)).	CSERC	Comment is related to regulatory actions rather than information on the scientific aspects of the status review.
1	The Final Status Review changed from the Draft Status Review in ways inconsistent with the peer review comments received by the Department on the Draft, which undermines the integrity of the peer review process.	CBI	Comment on process. DFG responded to R. Barrett's concerns about the document and information that was moved or eliminated as speculative. Most of the information was moved elsewhere and the DFG was more careful about distinguishing certainties from uncertainties based on the scientific information.
2	Questioned the DFG statement that managed forests are "sustaining the animals". There is no supporting evidence that managed forests can sustain fisher populations.	CBI	DFG is of the understanding that the northern California population and much of the southern Sierra population occur in managed forests and have successfully been sustained for many years. Not all habitat in a region such as the Sierra Nevada is actively managed, nor actively protected (see M. North peer review comment on patches of suitable habitat). DFG is unaware of specific information or studies on fisher, particularly in California, that have reported fisher populations are not being sustained because of managed forest conditions. The best scientific information available is that the populations are being sustained in these managed forests.
3	Did not appropriately weigh differences in scientific validity of sources of information—ie, use of both peer-review and non-peer reviewed information.	CBI	Peer reviewed scientific information was used throughout to describe fisher habitat relationships, requirements for foraging, denning, and resting; and for other important aspects of fisher ecology and life history. Much, or most of this science occurred on public lands administered by the US Forest Service. Information was also received from the private landowners and timber companies in the form of observations, locations, sightings, and habitat relationships—mostly monitoring/survey information. The DFG compiles all of this information in the status review per regulation/statute for the FG Commission to evaluate. Certainly, peer-reviewed scientific information carries more weight with the DFG and with the Commission; however when there is little peer-review information as in the case of fisher population response in relation to timber harvest practices, the DFG provided the best information available.

4	Considers most of the CBI modeling work to have been ignored. One reference was considered taken out of context and seemingly implied the population is not at risk of extirpation.	CBI	The Spencer work was cited 8 times in the review and the population model results were used as the basis for the southern Sierra Nevada analysis. The text considered out of context is from page 34-35 of Spencer et al. (2008) and was cited in the population trend section for the Sierra Nevada. The DFG status review document captured the modeled risk of extirpation for the southern Sierra Nevada population specifically from the Spencer/CBI work in the threats portion of the document on page 43, 44, and 47. DFG apologizes if the authors feel this treatment of their work is out of context.
5	Questions logic used to make final findings. Status review summarizes scientific information demonstrating threats, but concludes listing is not warranted. Fails to address CESA listing requirements to consider “significant portion of its range” in the review.	CBI	On pages xiii-xvi and 84-88, the DFG provides conclusions regarding the scientific information and logic used to arrive at the final recommendation. In the review, DFG considered the fisher populations in northern California, the Sierra Nevada, as well as statewide. Consequently, listing was considered for any/all of the fisher populations in the state.
6	Comment disagreeing with DFG’s conclusion there is a lack of “empirical” information to extrapolate population in Southern Sierra Nevada; considers the DFG use of <500 animals in the southern Sierra Nevada to be misleading.	CBI	DFG does not consider focused study areas and extrapolations rangewide, simulation models, or theory to constitute rangewide, unbiased, objective, and repeatable population assessments and trend over time, especially for such an elusive species. Such would constitute the empirical evidence needed to infer populations and trend and such efforts are needed (they are used in management of many of our large mammal species for example). Retrospectively working to create population estimates out of studies that were not intended to assess rangewide population status would be, and is, inappropriate – this is why the DFG refers to such population assessments as preliminary or best available whether in northern California or in the southern Sierra Nevada. The DFG report indicated that “…estimates that do exist…” DFG repeatedly indicated “fewer than 500” as the estimated number of fisher in the southern Sierra Nevada. DFG provided all the estimates and ranges reported from known studies and analyses (p. 25-36). These estimates ranged between 0-500 and all are specifically mentioned for consideration by the reader. Also, there is some confusion and inconsistency among the estimates about whether they all include only adults, or juveniles as well. Using “fewer than 500” animals was considered an accurate and non-inflammatory statement. DFG encourages peer-reviewed scientific information describing fisher population and trend from throughout the southern Sierra Nevada.

7	Comment on Self et al. population density estimates as flawed	CBI	The Self et al. analysis was included in the review as were several of the other unpublished analyses of fisher populations, flawed or not. The DFG indicated the preliminary nature (p. 27) of this analysis and cautioned (p. 28) about it; as were any of the other population models and estimates. It is DFG's understanding that the southern Sierra estimates rely on modeled occupied habitat as well as observed occupied habitat. DFG is of the understanding that each model has its own assumptions, flaws and limitations.
8	Status Review mischaracterizes scientific information; abundance estimate is at odds with reality and is misleading. Questions what DFG is looking for in terms of population information.	CBI	DFG does not disagree with the methodologies cited, nor the citations referenced or presented. DFG is primarily looking forward to reliable, survey/monitoring data upon which trend estimates in the southern Sierra Nevada over time can be developed. Other reviewers considered this section to be adequate. See response to CBI #6 above.
9	Clarification on DFG's notation that the methodology for population monitoring is intended to only detect declines.	CBI	DFG appreciates the clarification, and understands the reasons for it; and only questions that if monitoring is only set up to detect declines, how could it possibly detect increases.
10	Population size is not sustainable	CBI	DFG believes it remains unclear what the capacity for increase exists in the southern Sierra Nevada; DFG considers moving fisher north of the Merced River the most viable option to ensure population sustainability. Population has evidently sustained itself until 2010. Lamberson model predicted extirpation in 2000. DFG does not question that population models and extinction risk consider this population of less than 500 animals to be at risk. Gray wolf, bighorn sheep, tule elk, sea otter, elephant seal, and bison are other mammal species for which there were perhaps even lower numbers in the USA, and for which management intervention succeeded in restoring the numbers and prevented extinction. Consequently, the models do not accurately account for the intensive and ongoing management efforts over the past decades to stop trapping, stop poisoning of prey and of fisher, translocate fisher, study threats to fisher, and to protect late successional attributes of forests as well as late seral stands and reduction of fire risk.
11	Review failed to address CBI's habitat suitability model that fisher are associated with areas having the largest trees.	CBI	DFG does not dispute this information. Beginning on page 19 and in Appendix E, the status review indicates the importance of large, old trees and late seral forest and its attributes for denning, resting, and cover aspects.

12	Multiple field studies have concluded that resting and denning features and habitats are especially limiting to fishers in California.	CBI	DFG does not believe there are any scientific results/evidence (versus opinion, hypotheses, or theory) or experimental evidence that demonstrates resting and denning features are limiting the fisher population (preventing the population from increasing) in either the Sierra Nevada or in northern California. DFG is interested in this research area if it exists. DFG considers it could be true if the populations are indeed limited now (note R. Barrett comment letter of March 26, 2010 [p. 13] regarding knowing whether the population is increasing or decreasing). Clearly, there is ample evidence that fisher rely on these features and that forests in California have been significantly altered. Both of these are indicated in the status review. What remains lacking is the link to the fisher population (taking into account the historical impact of trapping and active poisoning of wildlife --predators as well as prey) and whether addition or elimination of these habitat features will in turn result in the anticipated increase or decline in the population.
13	Comment on process of peer review	CBI	Comment noted as one related to regulatory actions rather than information on the scientific aspects of the status review. See also CBI #1.
1	Pages 1-3 Comment on process of peer review	CBD	Comment noted as one related to regulatory actions rather than information on the scientific aspects of the status review. See also CBI #1.
2	Pages 4-5, Disagrees with DFG interpretation of Grinnell work and implication of trapping as opposed to timber harvest as a factor affecting fisher populations. Points to DFG claim “that everything must be fine”; states that credible arguments must explain other threats; states that DFG management pretend that trapping is the only issue.	CBD	DFG also referred to work by Dixon (1925)and Hall (1942) that corroborate the DFG interpretation of the Grinnell led work related to the impact of trapping (see also Fig. 12 and 13). The status review did not indicate that everything is fine. Rather, the status review provides information on the many potential threats to fisher. Management recommendations listed on pages 81-84 are demonstrative that improvements can be made. DFG did not indicate trapping is the only issue; the report describes the numerous issues and potential threats to fisher.
3	Status review is not based on the best available science. DFG asserts there has been an apparent recovery of the species. DFG is asking for science that does not exist rather than relying on the best available (p.5-6)	CBD	DFG solicited additional scientific input in addition to the input received during the draft peer-review. Cautions from the peer-review were incorporated. The reviewers felt that most of the relevant science was present and considered. This same scientific information was retained for the final status review. DFG has not received any significant new scientific evidence that demonstrates the fisher population is in jeopardy.

4	Status review ignores cumulative impacts and fails to discuss whether fisher is threatened in a significant portion of its range; disregards Distinct Population Segments (p. 7-8)	CBD	Cumulative effects were considered in the review (e.g., pages xii, xvi, 50, 71, 74, 80, 87). Cumulative impacts are largely unknown because the singular impacts of threats are largely unknown. Distinct Population Segments (DPS) is a federal term used in listing evaluations. The DFG considered the two populations of fisher in CA both independently as well as statewide.
5	Status review ignores differences between forest types and how historical impacts have shaped present condition (p. 8-11).	CBD	p. 19-24 of the review describes habitats for fisher and p. 37-40 discuss habitats as affected by timber harvest. Historical impacts are also mentioned in the distribution and range section of the review (p. 9-18).
6	Comments on DFG response to comments from individuals critical of the review process (p. 11-15).	CBD	Process comment. These comments are on the DFG response to comments rather than on the scientific aspects of the status review.
1	Using Grinnell era information as baseline is not reasonable foundation for comparison or development of a trajectory.	JORDAN	DFG agrees use of this information is tenuous and identified it as “rough” as well as “crude”, however, there is no other scientific information or basis with which to compare (e.g., pages 25, 26). Additionally, the basis of the UC Berkeley scientists-- Grinnell, Dixon, and Hall era conclusions that fisher were near extirpation was the statewide dataset on annual trapping. Present day trapping of fisher for study purposes is reasonably more productive by a handful of scientists than trapping for a living by many trappers during the 1920-40s as reported by the above authors. Using the commentors term, the trajectory in fisher numbers in California since the 1920-40s era is either the same, increasing, or decreasing. The only scientific information available, as well as consideration of any other information available to the DFG, indicates there are likely more fisher in CA today than during the earlier period.
2	Estimate of 500 animals in southern Sierra Nevada alone is sufficient to warrant listing	JORDAN	Neither the statute nor regulation indicate a population size as a threshold to warrant listing. DFG is aware that fewer than 500 animals in the southern Sierra Nevada is not a large population, and so indicated the potential threats based on this estimate (p. xi,xv, 31, 87).
3	Southern Sierra Nevada is comprised of sub-populations separated by river drainages; contributing to reduced genetic diversity.	JORDAN	This information was indicated and considered in the status review (e.g., page xiv, 6, 43, 45, 46, 82, 85, App. C). DFG is of the understanding that genetic diversity may be higher than thought as additional sampling has occurred (App. C).
1	Status review of the fisher has been a rigorous scientific process. We concur with their recommendation not to list.	CFA (California Forestry Assoc.)	Process comment. No response necessary. See also CBI #1.

2	Scientific studies in the eastern Klamath province, cited in the status review, suggest that fisher are persisting in landscapes which have been subject to historic trapping, numerous wildland fires, historic and current timber harvesting and extensive road building	CFA	Addresed in status review (e.g., p 38-39, 44). (Farber and Franklin 2005, Farber and Criss 2006, McKnight 2008, Farber et al. 2008)
3	Preliminary results of on-going fisher genetic research (Farber et al. 2010), conducted with the Department of Fish and Game, U.S. Fish and Wildlife Service and Rocky Mountain Research Station, indicate that, in the Klamath Province, Fisher are all genetically related, contrary to claims made by the petition that fisher populations are fragmented and genetically isolated.	CFA	DFG appreciates the update. The essence of this comment is included on p. 6 of the status review.
4	increasing lambda estimate and the shift in age structure towards a slightly higher proportion of adult animals in the Hoopa Study coupled with an increasing female to male ratio all indicate that the population is showing signs of stability or increase	CFA	Page xi, xv, 33, 34, 36 Status review. (Fisher habitat use and population monitoring on the Hoopa Valley Reservation, California Final Report USFWS TWG U-12-NA-1, 31 March 2009, p. 22)
5	There is a 3 year joint project to locate 40 fishers in Butte County	CFA	Translocation is discussed in status review. (see also March 26, 2010 letter to F&G Commissioners from Sierra Pacific Industries)
6	A reasonable conclusion is that fisher population in the southern Sierras is stable to increasing.	CFA	(Southern Sierras Fisher Telemetry Research Findings) (e.g., page 31,35,36)
7	Fishers occur in a variety of habitats, not just conifer old growth. Chris Carr, Morrison/Forrester provided an excellent summary of the abundance of fisher habitats across public, industrial and non-industrial lands in their March 6, 2008 letter to you (pp. 5-8). Further, they provide a synthesis of statutory and regulatory processes in-place both for public and private lands that will continue to provide abundant fisher habitat.	CFA	The information is part of the record and habitats are considered (e.g., page 19-25).
8	In Green Diamond Resource Company's March 26, 2010 letter to you, they point out that studies in Redwood National Park and in second growth lands (Slauson et al., 2003) show more fisher than expected in second growth and less than expected in old growth. This is likely due to a higher abundance of prey (wood rats) in the second growth habitat.	CFA	DFG appreciates this information.

9	We have incorporated our May 6, 2008 letter to you (prepared by Christopher Carr, Morrison/Forester) by reference because we continue to find all of the information and conclusions within that document as still being valid. We also include Green Diamond Resource Company's March 26, 2010 letter, Timber Products Inc. March 25, 2010 letter and Sierra Pacific Industries March 26, 2010 letter to you by reference as we find they also have a wealth of information pointing to an abundance of habitat and stable to increasing populations of fisher on the North Coast, in the Klamath Province and in the southern Sierras.	CFA	The information is part of the record.
10	May 6, 2008 letter includes a section on "Existing Regulation and Management for the Fisher are Adequate" which includes discussion about how additional voluntary measures under consideration including potential translocation programs, would "be frustrated" by listing the fisher. "Listing the fisher would frustrate implementation of a translocation program for SPI lands, as well as any possible multi-landowner translocation program to expand current fisher range. It would also frustrate any efforts by landowners with HCPs that do not currently cover fisher, such as Green Diamond, to work constructively with the Service to update their HCPs to include fisher as a "covered species." Indeed, it might be said that listing represents the greatest threat to the fisher."	CFA	Comment noted as one related to regulatory actions rather than information on the scientific aspects of the status review.
11	Based on the key points listed and our prior conclusions from May 6, 2008, CFA encourages the Fish and Game Commission to support the Department's recommendation to not list fisher under the California Endangered Species Act.	CFA	Comment noted as one related to regulatory actions rather than information on the scientific aspects of the status review.
12	Attached for your information is our correspondence to the California Fish and Game Commission on this subject, in case you have not already received it	CFA	Attachment had been received.
13	We believe the department did a very good job of collecting, evaluating and summarizing the current commercial and scientific information on this species. We concur with the department's recommendation to the commission that the Pacific fisher does not warrant listing as threatened or endangered pursuant to the California Endangered Species Act	CFA	No response necessary

1	We respect and appreciate the thorough and deliberative evaluation of the petition undertaken by the Department of Fish and Game and the Commission. Our comments on the “Status Review” are limited to two instances where we can contribute additional information.	Green Diamond	Process comment. No response necessary. See also CBI #1.
2	We believe it should be intuitive that if fishers have persisted on an intensively managed landscape without any conservation planning, the species will certainly have a high probability of persisting with conservation planning directed at fishers. GD is working closely with FWS on the development of a new terrestrial “Forest HCP” that will provide several measures for the conservation of the fisher including a formal and enforceable commitment by GD to implement the Terrestrial Deadwood Management Plan on its California Timberlands.	Green Diamond	The Status Review (pp 73-74) describes fisher conservation on Green Diamond property under its Northern Spotted Owl HCP, Aquatic HCP, and its Terrestrial Deadwood Management Plan. Status review indicates that fisher inhabit these managed landscapes. DFG indicated that forest and fisher management activities have improved in recent decades (e.g., p xii, 61, 62, 69, 75)
3	The Status Review (pp 85-86) offers a hypothesis that fishers prefer late seral forest habitat and that fisher density (abundance) is lower in intensively managed forests than it is in late seral forests. While this may be true in some portions of the fisher’s range in California, the existing data suggest that the opposite is true in the north coastal California.	Green Diamond	DFG appreciates this information. See p. 85-86 status review
4	Status Review did not mention one of the most important conclusions from Slauson et al. 2003 regarding fisher track plate detections in old growth and second growth.	Green Diamond	DFG appreciates this information. See p. 14, 29, Figure 1 Status review
5	Thompson 2008 MS was not reported in the Status Review. It found the highest fisher density reported for the west coast region on land immediately to the east of Redwood National Park (Green Diamond ownership).	Green Diamond	DFG appreciates this information. Page 29 Status review
6	Even though we do not know the reasons, it is clear that the data do no support the hypothesis that fishers are in low abundance on intensively managed timberlands.	Green Diamond	Comment noted. DFG indicates the desire for more comprehensive information on fisher population densities and trends throughout their CA range (e.g., p. xv, xvi, 27-36)
7	During the two years since the petition was filed in early 2008, the Department has done an extraordinary job of gathering and analyzing the best available scientific information concerning the fisher.	Green Diamond	Comment noted. No response necessary.

8	The key conclusions reached by the Department which relate to the Commission's decision whether to list the fisher under CESA are as follows…	Green Diamond	Process comment. No response necessary.
9	fishers in California cannot possibly be considered to qualify as either "endangered" (i.e., "in serious danger of becoming extinct throughout all, or a significant portion, of its range") or "threatened" (i.e., likely to become endangered in the foreseeable future).	Green Diamond	Process comment. No response necessary.
10	Given recent history with CESA listing petitions, should the Commission agree with the Department and decide that listing the fisher is not warranted, there is a substantial possibility that petitioners will seek judicial review. In our view, the legal defensibility of prior Commission decisions on CESA listing petitions has been significantly compromised, not because the decision itself was flawed, but because the Findings document was flawed.	Green Diamond	Process comment. No response necessary.
11	We therefore strongly recommend the Commission prepare and then adopt a thorough and complete set of Findings which explain in detail the Commission's factual findings, its reasoning, and its conclusions. We believe this is the best way for the Commission to both minimize the chances of litigation, and to maximize the chances of prevailing should such litigation occur.	Green Diamond	Process comment. No response necessary.
1	None of the listed pathogens or their respective disease is believed to constitute a significant source of mortality due to the inadequacy of complete transmission routes and solitary behavior of fishers. The concern with this statement is that many of the pathogens that are known to be either fitness-limiting or causes of mortality in mustelids, and more specifically *Martes*, can be transmitted by several mechanisms, including infected fomites and other host species within the community. There are several generalist pathogens that infect a wide variety of carnivore species and still have the ability to affect low density or solitary animals. Susceptible host species that are in higher densities, have larger or overlapping home ranges and cosmopolitan distribution can cause interspecific spillover to rare species of concern (Woodroffe 1999, Daszak et al 2001)	Gabriel	Comment appreciated. DFG expressed caution and uncertainty regarding the effects, or threats, of disease on fisher individually or at the population scale. (e.g., ix-x, xi, xiv, 37, 52, 58, 83, 85)

2	One of several generalist pathogens currently being investigated among several of the California fisher projects is parvovirus, for which preliminary evidence suggests that its etiology may cause malabsorbtion and potential morbidity (M.W. Gabriel unpublished data). In particular, this pathogen is highly resistant to environmental degradation and can persist and remain infective for months, possibly years, in the environment (Barker and Parrish 2001). Therefore even solitary animals are susceptible to pathogenic exposure.	Gabriel	DFG expressed caution and uncertainty regarding the effects, or threats, of disease on fisher individually or at the population scale. (e.g., ix-x, xi, xiv, 37, 52, 58, 83, 85)
3	Distemper virus, another generalist pathogen which causes morbidity and mortality in fishers (S.M. Keller and M.W. Gabriel unpublished data) as well as other *Martes* species (Van Moll et al 1995), can be transmitted not only by contaminated fomites, but through direct contact with multiple carnivore species. Therefore, fishers can potentially be exposed in multiple ways, contrary to their understood life history, to generalist pathogens that are fitness-limiting or cause mortality.	Gabriel	DFG expressed caution and uncertainty regarding the effects, or threats, of disease on fisher individually or at the population scale. (e.g., ix-x, xi, xiv, 37, 52, 58, 83, 85)
4	The specific numbers of predated fishers each species of predator is responsible for is known for each of these fisher research projects, but is not indicated in the review. Though it isn't stated, bobcat is the most frequent predator of fishers on two of these projects, and a significant predator on the third. Specifically, for the SNAMP project's cited 10 fisher predation events, the predator species have been molecularly identified by detecting DNA from the saliva of the predators (Wengert et al. unpublished data). These analyses resulted in at least six fishers killed by bobcats, two by mountain lions, and one by coyote (Wengert et al. unpublished data). Using similar methods for the Kings River Fisher Project, we have identified four fishers killed by mountain lions, two by bobcats, and two by coyote (Wengert et al. unpublished data). Among the fishers killed on the Hoopa fisher project to date, we have verified that at least four were killed by bobcats, as determined through genetic methods	Gabriel	As these studies related to disease investigations are in progress, DFG anticipates the final results and findings before DFG would suggest the significance of such mortality factors to the fisher population(s). Additionally, more detailed information on mortality factors and their contribution to population status is needed.

1	Asked the Department to retract his evaluation of the draft fisher Status Review. Has not had time to evaluate the final Status Review.	R. Barrett	The status review is not anticipated to be revised as it is a public document.
2	Expressed disappointment that the Department did not ask for a peer review of the final Status Review by new senior fisher experts.	R. Barrett	The review opportunity addressed here resulted in comments from eight (8) individuals who are considered scientists/experts on the fisher and its habitat. See also CBI #1.
3	Provided a draft progress report dated May 27, 2010, suggesting fishers no longer occur north of the Merced River as was the case in 1994.	R. Barrett	The report suggests fishers no longer occur north of the Merced River in Yosemite National Park. Fishers were present in that area in 1994. Dr. Barrett stated additional surveys are needed to test his hypothesis that the range of fishers in the southern Sierra has been retracting southward for several decades. DFG agrees additional surveys would be needed to verify that fishers are currently absent north of the Merced River in Yosemite National Park.
4	Stated there is clear biological evidence that the southern Sierra fisher population is threatened and recommended the Commission list that population alone.	R. Barrett	This conclusion appears to have been based on Dr. Barrett's draft progress report dated May 27, 2010. No biological evidence was provided to conclude the southern Sierra fisher population is threatened and should be listed.
1	The Department's request for "additional scientific review" is not equivalent to the rigorous peer review requested by the author and other scientists. The current comment period, while it may attract additional comments from stakeholders, is unlikely to result in detailed peer review comments by the most qualified experts.	Carlos Carroll	The review opportunity addressed here resulted in comments from eight (8) individuals who are considered scientists and experts on the fisher and its habitat. Additionally, comments from three companies that own and administer habitat upon which fisher depend also provided comments. See also CBI #1.
2	The significant alterations to the draft document have resulted in a final status review that does not fulfill the Department's substantive obligation to produce a document based on the "best scientific information" rather than stakeholder opinion.	Carlos Carroll	Process comment. See also CBI #1.
3	The author encourages the Commission and the Department to implement a rigorous peer review of the document by independent scientists.	Carlos Carroll	Process comment. The review opportunity addressed here resulted in comments from eight (8) individuals who are considered scientists and experts on the fisher and its habitat. See also CBI #1.
1	It seems abundantly clear that fisher did occur within the currently unoccupied portion of the Sierras even as late as Grinnell's time, though it is likely that they were not distributed evenly throughout the range defined by Grinnell.	J. Mark Higley	The status review indicates this (e.g., p 15). See also response to Thompson and Green, #8, below. DFG does not have sufficient scientific evidence to support the second point regarding evenness of historical fisher distribution.

2	Sheer distance and the narrow peninsular configuration between the two current populations in CA may have allowed for genetic divergence for many thousands of years. It is possible that fishers now missing from the central and northern Sierra may have been much more closely related to the southern population than the northern population.	J. Mark Higley	The Status review repeatedly indicated the preliminary nature of the genetics work on the fisher; and that management decisions should not be based on such preliminary information. DFG considers there is insufficient scientific evidence, and too few specimens, to identify historical subpopulations of fisher between northern California and the southern Sierra. There is insufficient scientific evidence, and too few specimens, to support the second point regarding relatedness of fisher populations, historically.
3	The author does not support diminishing the potential importance of the central and northern Sierra simply because genetic data suggests that separation between the northern and southern population may have been thousands of years.	J. Mark Higley	DFG did not diminish the importance of the central and Northern Sierra Nevada to fisher in California (see response to Thompson and Green, #4 and #8, below). Also, the fisher translocation project currently underway in the northern Sierra indicates that DFG does place importance on this part of fisher range in CA.
4	Calculations of lambda with 5 years of mark recapture data indicated a stable to possibly increasing population based on the point estimate, however the 95% CI included 1 and therefore the population could be either declining slightly, stable, or increasing slightly. If entire populations go through periodic cycles, translocation might be detrimental to the source populations if implemented at the wrong time.	J. Mark Higley	DFG appreciates the clarification provided in the first point. The status review (p. 35) quoted Higley and Matthews (2009) as indicating the population was showing signs of “stability or increase.” DFG does not have sufficient scientific evidence to support periodic population cycles by fisher, but agrees there likely is interannual variability in births and deaths.
5	While it is true that the southern population has persisted for quite a while, it is a mistake to assume that it is not at risk.	J. Mark Higley	The status review identifies the potential threats to the fisher including the southern Sierra population (p. 37-59)
6	Working toward the expansion of the two populations or the establishment of new ones should be a high priority for the state.	J. Mark Higley	DFG recommendations (pages 81-84) concur with this comment.
7	Presence and even reproduction within an area does not necessarily indicate source habitat.	J. Mark Higley	DFG did not identify any habitat as “source” habitat or “sink” habitat. Presence of an increasing population, over a time period to encompass environmental variability would be a predictor of source habitat. DFG is unaware of any studies of fisher populations that have identified the presence of source/sink habitats (or geographic areas). Habitat selection/preference studies have indicated the preferred habitats of fisher for denning and resting in particular (e.g., p. 19-24)
8	Fisher conservation efforts must consider and emphasize the landscape scale.	J. Mark Higley	see management recommendations (p. 81-84) in the status review that incorporate this idea.
9	Fisher habitat managers need to consider the importance of structural scale while still planning at the landscape scale. Highest fitness habitat configurations will allow for many high fitness home ranges in close proximity with high connectivity.	J. Mark Higley	see management recommendations (p. 81-84) in the status review that incorporate this idea.

10	Fisher can be recovered without listing at the state or federal level with cooperation from private landowners.	J. Mark Higley	Process comment. While certainly possible, this is not a comment on the scientific aspects of the review.
1.	Recommends use of “The Science Consistency Review: A Tool to Evaluate the Use of Scientific Information in Land Management Decisionmaking” (Guldin et al. 2003) as a framework for considering the science used by DFG to reach a decision regarding the fisher listing petition.	William J. Zielinski	Process comment. DFG’s mandate regarding the use of science in a status review is to use “the best scientific information available to the Department” (Fish and Game Code section 2074.6); the recommended resource could be a useful tool for the Department to integrate into future scientific review processes and management decision making.
2.	Key scientific information related to changes in late-seral/old growth forest distribution relative to apparent changes in fisher distribution was not considered. Specifically: Franklin and Fites-Kaufman, 1996; J. Bouldin, 1999; and L. Campbell 2004.	William J. Zielinski	DFG did review Bouldin (1999) and Campbell (2004) after receiving reference to them by Dr. Zielinski in late January 2010 during the peer review period, but failed to include them as citations due to a simple omission error. DFG did indicate the significant changes to forest communities in California that are represented by the references (see CSERC response #1). The timing of changes in forest conditions in the Sierra Nevada documented in these references appear to come after the period of heavy trapping activity, and during the period of heavy predator/prey control and poisoning. Consequently, it would be tenuous to draw a relationship between logging in the past 75 years and the absence of fisher from the central and northern Sierra Nevada. The significance of trapping was considered on p. xiv, 14, 18, 19, 25, 26, 55.
2.a.	The Department failed to note that where the intensity of historic logging was greatest and caused the greatest subsequent change in forest structure (i.e. the northern Sierra Nevada) is also where fisher now appear to be absent from their historic range. For example, Bouldin (1999) found basal area in northern Sierra Nevada forests to be 52% of 1935 levels due largely to drastic decreases in trees >36” d.b.h.	William J. Zielinski	See response to #2 above. DFG is unaware of scientific evidence that demonstrates a cause-and-effect relationship between historical logging in the northern Sierra Nevada and a decline in fisher numbers in the region. Correlative information should be considered, and considered in complete context. In that regard, DFG considered trapping, logging, and poisoning for example, as three factors (correlates) that also need to be considered and correlate with fisher absence in portions of the Sierra Nevada. DFG considers the historical information available to be inadequate for developing the inferred association between timber harvesting in the Sierra Nevada and the fisher population (e.g., p. 40).
2.b.	The Department did not reference or address Campbell’s (2004) finding that where fisher still occurred in the Sierra Nevada there was “more and larger trees (hardwoods and conifers), steeper slopes, more shrub cover and fewer roads” than in portions of the Sierra Nevada no longer occupied by fisher.	William J. Zielinski	See response to #2 above. DFG would add that these same areas also include national parks where fisher would have been protected and where trapping and poisoning would not have occurred (e.g., p. 87).

2.c.	The Department did not reference Zielinski et al.'s (2005) findings that the southern Sierra Nevada had a greater proportion of old growth than the northern Sierra Nevada in 1945, and the difference became more pronounced through the period of 1945-1995.	William J. Zielinski	DFG did use this reference in the status review based on the literature cited/reference section, however, did not cite the particular point made in this comment. The essence of the comment however (that southern Sierra is better habitat for fisher than the northern Sierra) is reflected in the status review (p. xvi, 37, 87) where DFG indicates that the protections of the national parks would benefit fisher; ownership patterns are mostly public south of the Merced R.; (p. 16 and Fig. 6); and status of forests in the central Sierra Nevada (p. 40 and M. North's peer review). These factors would also suggest more late seral forest habitat in the southern Sierra Nevada. Fisher were already considered nearly extirpated by the mid-1940s due to trapping when trapping was finally prohibited after approx. 20 years recommendation of such by UC scientists. Consequently, changes since 1945 cannot explain the paucity of fisher in the 1920-40s era.
2.d.	Due in part to the above omissions of relevant information sources, the Department failed to recognize that the area of greatest historical timber harvesting and associated changes in forest structure correlates with the area of fisher absence.	William J. Zielinski	See above comments to 2a, 2b, 2c. Interestingly, R. Barrett postulated (per comments considered herein) that fisher are absent north of the Merced River which includes substantial acreage of Yosemite National Park that has not been subject to timber harvesting. Consequently, the correlation described breaks down in some cases, consequently, it should not solely be relied on as the scientific evidence for decision-making. Similarly, in northern California, fisher inhabit range that is subject to timber harvesting and has altered forest structures as well as the northern Sierra.
2.e.	Private timberland ownership patterns, coupled with inadequate Forest Practice Rules protections from additional loss of late-seral elements and dense forest cover (which research has demonstrated to be important for fisher) may lead to continued loss of fisher habitat.	William J. Zielinski	Comment on ownership patterns and perceived regulatory effectiveness were addressed on pages 59, 60, 65-78. Dense forest cover was identified as important to fisher (p. 19-24, and see CSERC #2).
2.f.	The status review ignores Zielinski et. al's (2005) finding that the central Sierra Nevada gap in the fisher range aligns with the area of greatest human influence and rapid development (Nevada, Placer, Eldorado, and Amador counties) which has caused the loss of lower elevation fisher habitat and impacts associated with greater human presence in nearby forest lands.	William J. Zielinski	DFG acknowledged the development and growth of communities in the Sierra Nevada, particularly in the recent decades and identified it as a potential threat (e.g., pages xi, 52-54) for fisher as well as a host of other wildlife species. However, DFG is unaware of scientific studies to determine the impacts of such activities on the survival, fitness, and/or population trend in fisher. Fisher were considered quite rare (approx. one observation/yr) from the central and northern Sierra Nevada during this period of growth.
3.	Some scientific information was interpreted unreasonably or incorrectly by the Department.	William J. Zielinski	Specific comments/responses below.

3.a.	Department statement on page 37 of the status review: "…*there is not substantial empirical evidence to indicate that timber harvesting, availability of denning and resting structures, or the long-term decline in late succession forest acreage is limiting fisher populations in California*" is incorrect due to strong correlative evidence stated above in 2.a.-2.e. above.	William J. Zielinski	DFG does not believe there have been studies (that provide the empirical evidence) of fisher population change or trend in California that have determined the factor most limiting their populations. Given that fisher numbers were depressed by trapping and poisoning during much of the 1900s, DFG does not have adequate knowledge of the current population in relation to carrying capacity of the range to determine whether the population is currently limited. The references in 2a-2e are references largely about changes in forest habitat condition. There is not the necessary accompanying evidence to indicate that fisher populations declined as a result of those changes. Additionally, the status review documents recent information, collected from private timberlands that indicates use of habitats by fisher that are not late successional forest. Scientifically (experimentally) capturing the limiting factor would likely involve steps such as these: 1) Demonstration of habitat requirements of fisher. 2) Demonstration of the trend/condition in those habitats over time. 3) Demonstration of population status/trend in fisher over time; and 4) Demonstration (experimental) that the fisher population is limited by the lack of such habitats. DFG is of the understanding that step #1 above is largely known but is now broadening based on more recent information coming from managed forests; step #2 is fairly well known; step #3 is unknown; and step #4 is unknown.
3.b.	Evidence that fisher can survive and reproduce on private timberland in northern California should not be viewed as evidence that fisher can survive and reproduce on ALL commercial timberlands in California.	William J. Zielinski	DFG concurs with this statement. The status review did not indicate that fisher can survive and reproduce on all commercial timberlands. On p. 39, the status review indicates not all managed timberlands are inhabited; p. 40, 41, 81-83, 86 indicate this as well and the need for additional, specific study of habitat relationships on intensively and/or privately managed forests; p. 19-24 describe the habitat attributes for fisher and does not mention all commercial timberlands.
3.b.i.	It is logically possible that fisher reproduce on private timber land (particularly in moist, productive northwestern California) AND for fisher to have been lost from the portion of their historic range where timber harvesting has most affected mature forest structure (i.e. north-central Sierra Nevada).	William J. Zielinski	DFG concurs that this is possible, but believes that it remains untested scientifically and cannot be retrospectively established. The closest test of this hypothesis appears to be the ongoing experimental translocation project in the northern Sierra Nevada where fisher have been relocated to historical range that has been subjected to the timber harvest strategies described by the comments. (see also CSERC #3).

3.c.	It is unreasonable for the Department to conclude "*That fisher inhabit managed forests indicates that suitable habitat elements are present at levels adequate to sustain the animals*" because (1) fisher appear to be absent from the regions where timber harvest impacts have been greatest, (2) important habitat elements like large snags and large trees are significantly less abundant on private lands, and (3) uncertainties in compliance with Forest Practice Rules.	William J. Zielinski	See response to comment #2 above and response to CBI #2 and #10 that indicate fisher populations do occur in managed forests. Confounding the conclusion in the comment is that fisher are also reportedly absent from areas where the impacts have not occurred as in Yosemite NP north of the Merced R. DFG does not believe there is any scientific finding that has demonstrated the population of fisher is limited by the number of snags and large trees. The best available science indicates these elements are less abundant, yet the link to fisher population numbers and trends is unknown.
3.d.	The Department referred to unanalyzed and unpublished data from the U.S. Forest Service southern Sierra population monitoring data in only the most favorable light. This information lacks estimates of variation and precision.	William J. Zielinski	DFG reported the preliminary information as reported in winter 2010 by a USFS fisher scientist at the TWS meeting. The population information presented by DFG included all the estimated information that was made available regarding information on the southern Sierra population. DFG referred to the information in the light it was presented. Should the results change in the future as time goes on, that certainly would be a factor to consider (see below comment as well).
3.d.i.	There is no basis for the Department to conclude that "*preliminary analysis of survey data …suggested no decline in the index of abundance*" (p. 35), or that "…*preliminary information …in the southern Sierra Nevada indicate they are stable to slightly increasing*" (p. 86). Occupancy estimates, once analyzed, are expected to have wide confidence intervals which may include the possibility that fisher populations are declining.	William J. Zielinski	DFG included the statement based on Truex et al. 2009 which was incorrectly identified as an abstract from the Martes Symposium. It was from the TWS conference in 2010 and the DFG conclusion was based on comments by the lead author, R. Truex. If, as the comment suggests, there remains uncertainty in the 2002-2008 data that preclude inferring whether the population is declining, stable, or increasing, the DFG accepts that. Regardless, the DFG cautioned the Fish and Game commission from making decisions based on such preliminary information (p. ix, xi, 32, 35, 36)
3.e.	The Department's reliance on Grinnell et. al's 1937 fisher distribution data as a baseline against which to judge distribution retraction is unreasonable. Grinnell et al. (1937) relied on trapping data from a 5-year period (1919-1924) which followed a period significant habitat loss in California. Grinnell's own interpretation of fisher distribution at the time was that fisher were distributed throughout the Sierra Nevada.	William J. Zielinski	DFG relied on Grinnell et al (1937), Dixon (1925), and DFG trapping data (e.g., Figure 12 and Figure 13) to infer the decline in fisher and fisher range during the period. While there were observations of fisher in the Sierra Nevada since the 1920s, they are strikingly few (perhaps one per year). As indicated, there is no other benchmark that even considers the range/distribution (p. 9-18) or abundance (p. 25-31) of fisher from a historical perspective. This was the best scientific information available to the DFG (p. 17-18) and was the best scientific information coming out of the DFG or the University of California and Museum of Vertebrate Zoology at the time. DFG considers Grinnell's interpretation to be describing fisher range as opposed to actual fisher distribution (which is better borne out through the trapping information). See also responses to # 4 and #8 of Thompson and Green, below.

4.	Uncertainties associated with data, and the consequences of relying on uncertain data to reach a decision regarding fisher listing is not fully explained in the status review.	William J. Zielinski	DFG considers the status review to have been careful at describing areas of uncertainty in the science in drawing conclusions and reaching a decision (p. 13-16, 84-88)
4.a.	Consequences of the uncertainty associated with a lack of statewide fisher monitoring, and a lack of Forest Practice Rule compliance and monitoring given the small species population is not fully considered.	William J. Zielinski	DFG concurs that without statewide or population level monitoring of fisher, the consequences are exemplfied in this status review. Several facets that are called for in a status review are frustratingly unavailable or inconclusive and result in uncertainty regarding impacts of management as well as lack of knowledge about populations and trend. FPR compliance is a regulatory aspect that also would require monitoring to assess the change/modification of habitat.
4.b.	Uncertainty associated with preliminary, unpublished genetic data related to the historic longevity of the gap in fisher distribution is not fully acknowledged.	William J. Zielinski	DFG considers the uncertainty to have been explicitly stated on page ix of the Findings.
4.c.	Population size and density information is presented appropriately with caveats regarding the preliminary, unpublished, non-peer-reviewed nature of the sources.	William J. Zielinski	No response necessary (see CBI #6 and Thompson and Green #1)
5.	The risks to fisher from a listing decision are not adequately represented.	William J. Zielinski	These risks or threats are not specifically included in the status review (it is not a status of the fisher question) as they are more appropriate for Commission deliberation and some risks have already been advanced at commission meetings such as an unwillingness of landowners to participate in translocations should the fisher become a listed species.
5.a.	Risks associated with uncertainty regarding Forest Practice Rules application along with the failure to recognize the relationship between historic timber harvest intensity and current fisher distribution, coupled with the risks associated with small population levels were not fully explored. There should be a discussion of the consequences if Department assumptions about southern Sierra Nevada population viability, application of the Forest Practice Rules, and other assumptions prove incorrect.	William J. Zielinski	Threats associated with FPR's are discussed (p. 65-78). The status revew addresses the status of the fisher based on the scientific information available. See comment #5b for possible consequences if DFG findings prove incorrect.
5.b.	Uncertainty associated with the use of and reliance on unpublished and preliminary results from work with fisher on private timberlands should be discussed along with the implications of alternate results which may emerge in further analyses of the data.	William J. Zielinski	If the current preliminary results of fisher studies be completed, and if they demonstrate anticipated/unanticipated conditions for the fisher population(s), the public and/or DFG can reconsider the species for listing.

1.	Status review authors conducted exhaustive review of relevant literature and thoroughly documented population status, life history and current threats.	Craig Thompson, and Rebecca Green,	Comment noted.
2.	Body of material presented in status review seems to lead towards a recommendation for listing but review concludes with discontinuous recommendation against listing.	Thompson and Green	DFG worked to present as objective a report as possible regarding the status and uncertainties regarding fisher in California. Whether the material leads toward a recommendation to list or not depends on the perspective of the reader in terms of knowledge, objectivity, and tolerance for risk.
3.	Edits to review following peer review appear to have systematically removed any implications that past timber harvest contributed to fisher population decline or that timber harvesting is currently limiting the natural recolonization of unoccupied habitat.	Thompson and Green	Edits to the document removed, moved, or edited material that was not supported by scientific evidence. There is no scientific evidence (as represented by peer-reviewed studies of a fisher population[s]) that demonstrate a decline in fisher population in relation to, or because of, timber harvest activities. There similarly is not scientific study or experimental data to indicate that the population is prevented from recolonizing unoccupied habitat because of timber harvesting (see similar responses above). Studies of fisher have essentially been "passive" in this regard; i.e., the conclusion seems to be: "fisher are not moving back into historical ranges as fast as we think they ought to, therefore timber harvesting must be the reason." The translocation experimental project is the only "active" test of this hypothesis underway in California.
4.	Department conclusion that "*There is little empirical evidence of fisher previously inhabiting this gap in the Sierra Nevada Range*" is incorrect in light of trapping records in Grinnell et al. (1937), observations summarized in Schempf and White (1977), Tahoe National Forest records noted in the status review, and annual reports of the Stanislaus Forest Supervisor (1921, 1925).	Thompson and Green	DFG considers this amount of information in the "gap" to be "little"—approximately one observation per year throughout most of the Sierra Nevada since the 1920s. DFG did not have the Stanislaus NF reports and does not know the veracity of those reports. Grinnell et al. (1937) and Lewis and Zielinski (1996) noted that most fisher trappers were fisher specialists. Trapping records of take locations are likely indicative of where the specialists were working, and therefore not a random sample of potentially occupied fisher range. Also, we don't know what other information was available had more trappers been interviewed. The "sample" taken by Grinnell et al. (1937) via interviews cannot be compared to today as fisher are no longer trapped.
5.	Department conclusion that "…*there has not been substantial change in fisher population distribution since the Grinnell period of the 1920's*" is incorrect in light of the above comment coupled with the failure of recent intensive camera and track plate surveys in the same region to detect fisher.	Thompson and Green	See response above for #4. DFG considers the small amount of observations in the area since the 1920s to be indicative of a population that was largely eliminated by the 1920s.

6.	Use of Grinnell et al.'s (1937) fisher range description as a historical baseline can be supported by the fact that contemporary fisher detections (Green 2007) in places where they still occur show remarkable consistency with the range depicted by Grinnell et al.	Thompson and Green	Comment noted.
7.	Lack of historical fisher records in the Tahoe region could be the result of the synergistic impacts of trapping and timber harvesting which were well advanced in the Tahoe area before Grinnell began his surveys.	Thompson and Green	DFG considers that this may or may not be true, and probably cannot be determined retrospectively.
8.	Recent, preliminary genetic work conducted by Schwartz et al. suggesting that northern and southern California fisher populations have been separated far longer than previously thought was relied upon too heavily in the status review (pp. Xi, xii, xv, 6, 15, 19, 85, 86).	Thompson and Green	The described genetic information was not relied upon, and was specifically cautioned against being used for decision-making given the preliminary nature of the data. Reporting and reliance on the preliminary information was repeatedly qualified, particularly in the Findings on page ix of the status review. Additionally, on p. 15 of the status review the Department indicated: "Given the natural distribution of forest vegetation of California, there is no reason to doubt this description of fisher range by Grinnell and colleagues." The DFG considers the information available to indicate fisher historically occupied the northern and central Sierra.
9.	The review's conclusion that fisher populations are stable to slightly increasing in the studies discussed (Hoopa, USFS R5 Forest Carnivore Monitoring, Kings River Project, and SNAMP) is inappropriate and ignores important information.	Thompson and Green	DFG reported on the population level information available and adhered to the statements of the various sources as the best (only) scientific information available regarding populations. The DFG indicated populations are largely unknown (e.g., p. 27-36). Drawing conclusions on population trend for the 2 populations is difficult due to the preliminary and non-peer reviewed nature of the available information. However, the discussion on page 87 of the status review best covers the Department's concern for fisher population status, and our current effort at preliminary investigation of translocation is indicative of our concern for fisher population viability in California.
9.a.	The statement that fisher are stable to slightly increasing in the Hoopa area (p. 86) is misleading absent the context of the original report. The complete Hoopa report (Higley and Matthews 2009) states that the local population may have been rebounding from relatively devastating event that occurred between 1998 and 2004, influencing lambda estimates and trends in sex ratios measured at the time of the study.	Thompson and Green	DFG concurs that citations should be read in full to obtain the full understanding of results.

9.b.	Extrapolating results from the Hoopa study to the regional population is inappropriate.	Thompson and Green	DFG concurs as did one of the peer-reviewers. DFG has limited resources to monitor the northern California population, and is contributing to the demography studies on Hoopa in order to better understand fisher population trends on managed lands. (see also response to Slauson #6). Department considers that forest vegetation, fire history, and management strategies vary throughout the northern California landscape, making population assessment difficult.
9.c.	The Department's summary of the USFS Forest Carnivore Monitoring Program is correct; however, it is important to note that short-term population stability does not equate to population persistence. The southern Sierra fisher population is well below 5000 individuals; it is isolated and at high risk of fragmentation due to the elongated, narrow band of habitat; and it is exposed to numerous increasing threats as identified in the review. It should therefore be characterized as precarious.	Thompson and Green	DFG appreciates the comment, although "precarious" would be a new designation. As indicated by the comment, the status review describes the threats.
9.d.	The Department has responded to comments on the review made by J. Buckley by stating: "*What little available scientific evidence there is indicates that the fisher has rebounded since the 1920's from being nearly extirpated and virtually untrappable to abundant enough that studies can capture 50+ animals rather easily*". This statement is incorrect. Capturing 50+ animals took a crew of 8-10 full time technicians using advanced equipment and techniques 3 years to complete.	Thompson and Green	Clarification on capture effort so noted (although comment implies it was a full-time job for 8-10 individuals which is doubtful). Commentor's study was not the focus of the quote, but rather Hoopa and SNAMP studies were because DFG found little information available on the Kings R. study). In retrospect, DFG would not have said "…rather easily…" but would have made comparisons. More recently, in two months time, a handful of scientists captured 19 fisher in northern CA during winter 2009-10. By comparison, the annual trapping by professional trappers using dogs (likely more effective than advanced equipment) during the 1920-40s was far less than these numbers.
9.e.	Southern Sierra Nevada fisher research projects (USFS R5 Forest Carnivore Monitoring, Kings River Project, and SNAMP) are located in what is recognized as the best remaining habitat in the Sierras where the majority of the remaining Sierra late seral/old growth forests are located (Franklin and Fites-Kaufmann 1996, Zielinski et al. 2005). Therefore, results from these studies should not be extrapolated statewide.	Thompson and Green	DFG concurs and is unaware that extrapolations were made statewide. To the contrary, these areas were specifically identified as small focused areas where fisher have been captured in relatively high numbers in comparison to historical trapping throughout fisher range.

10.	The Department relied too heavily on unpublished timber industry literature related to fisher and timber harvesting while a body of peer-reviewed literature exists regarding the impacts of timber harvesting on the closely related American marten.	Thompson and Green	The DFG summarized the information provided. If DFG had not reported on private timber industry submissions, there would be essentially no information for a significant portion of fisher range in CA. As reported at Commission meetings, the timber industry primarily is involved in survey, monitoring, and inventory work that is rarely admissable in peer-review journals. These obviously differ from focused studies of fisher habitat relationships on public lands by public agencies. While the DFG appreciates information and science on the marten, it is not information on the fisher which is the focus of the status review.
10.a.	Timber harvesting has been shown to reduce the quality of marten habitat through the loss of overhead cover, reduced forest structure, and reductions in prey density (Campbell 1979, Thompson 1994, Thompson and Colgan 1994, Payer and Harrison 2003, Fuller and Harrison 2005, Godbout and Ouellet 2008).	Thompson and Green	No response necessary. (see above comment #10).
10.b.	A recent review of the response of mammals to timber harvest concluded that logged areas acted as sinks for marten until approximately 30 years post-harvest (Fisher and Wilkinson 2005).	Thompson and Green	DFG is unaware of any studies of fisher populations that have identified the presence of source/sink habitats (or geographic areas). DFG discussed evidence of fisher response to timber harvest on p. 38-39.
10.c.	A recent study showed marten density in unlogged landscapes was twice that found in logged landscapes and that the martens trapped in unlogged landscapes were in "*significantly better condition than those obtained from logged landscapes, probably due to improved predation success*" (Fryxell et al. 2004).	Thompson and Green	See response to #10, above
11.	The statement that "…*the extent to which avoidance of more open canopy areas within home ranges adversely affects fisher fitness is unknown*" (p. 39) is not entirely correct. Some evidence exists that there may be adverse consequences to fisher from altered behavior.	Thompson and Green	Comment noted, see responses to questions 10 and 10b, above.
11.a.	Both marten and fisher have been shown to use larger home ranges on harvested landscapes, presumably due to needing to search larger areas to obtain necessary resources (Zielinski et al. 2004, Potvin and Breton 1997, Truex et al. 1998).	Thompson and Green	DFG discussed and cited the Truex et al. (1998) study on page 38-39. See also response to #10, above.

11.b.	Powell (1977) decomposed the foraging energetics of fishers and discussed how increased search times could negatively impact survival.	Thompson and Green	Comment noted. See management recommendation #21 on page 84.
11.c.	Thompson (1986) documented that marten encounter prey 2-3 times more often and killed 21%-178% more biomass in unharvested stands than in harvested stands.	Thompson and Green	See response to #10, above.
11.d.	As stated above, Fryxell et al. (2004) documented that martens trapped on harvested landscapes were in significantly poorer condition than marten captured on unlogged landscapes.	Thompson and Green	See response to #10, above.
11.e.	Predation on fishers has been shown to occur more frequently in open, fragmented, or edge habitats (Buck 1994, S. Mathews and M. Higley pers. com., C. Thompson and K. Purcell unpubl. data).	Thompson and Green	DFG supports additional research of predation on fisher to understand its importance in population dynamics, and as noted on page 49, we are currently providing funding for work on fisher predation. See also point #10 on page 60, and management and recovery recommendation #8 on page 82
12.	The reproductive rates from various studies cited on page 9 of the review are all based on examination of females caught during the summer. Based on our experience in the Kings River Project that method results in extremely unreliable estimates of reproductive rates.	Thompson and Green	Comment noted.
13.	Reproductive rates on the Kings River Project verified by intensive year round monitoring of females and young have been found to be consistently higher than those reported on page 9: 91% of adult females reproducing in 2008, n=11; 75% in 2009, n=16; 86% in 2010, n=14).	Thompson and Green	Comment noted.
14.	Despite high reproductive rates measured on the Kings River Project, there is still no evidence of natural recolonization north of the Merced River.	Thompson and Green	Lack of evidence for natural recolonization north of the Merced River was considered and noted in the Status Review. See also management recommendations 5, 6, 13, 14, and 15-19 (pages 82-83).
15.	The review notes a lack of information from within the national park boundaries. However, Rebecca Green provided survey data from track plate and camera surveys conducted within Sequoia and Kings Canyon National Parks between 2002 and 2004. The submitted data was not included in Figure 7 or elsewhere in the review.	Thompson and Green	Omission noted. DFG did receive the information provided, and discussed it briefly on page 16. However, it was inadvertently left out of the data layers used for the figures in the Status Review.

16.	Fisher detections from within Sequoia and Kings Canyon National Parks were widely distributed on the west slope, but infrequent, with detections at 9 of 79 survey sites.	Thompson and Green	Comment noted, see answers to # 15
17.	Rebecca Green (2007) was cited in the text but not listed in the Literature Cited section.	Thompson and Green	Omission of Green (2007) in the literature cited is noted. See answers to # 15 and 16
18.	The statements "*Younger stands with high canopy cover may provide suitable foraging and dispersal habitat, and stands with sufficient late seral habitat elements may be suitable resting and denning habitat*." regarding fisher use of industrial forest lands on page 38 are speculative and should be removed from the document:	Thompson and Green	Comment noted. DFG could have been more comprehensive by noting that presence alone does not equate to long term population viability, especially in changing forested landscapes, including climate-change (pages 57-59).

19.	Fisher qualify for listing as threatened based on the Department's definition of threatened and endangered (A native species which is (or is likely to become) in serious danger of becoming extinct throughout all, or a significant portion, of its range….(Fish and Game Code sections 2062, 2067)) and the information presented in the status review and elsewhere indicating that: • Fisher are absent from 43% of their historic range • The southern Sierra population is at high risk due to isolation, low population, elongated and fragmented habitat distribution, and increasing threat from fire, roads, development, and timber harvest • The majority of the northern California range occurs on industrial forest land where demographic data is limited • Overexploitation, changes in habitat, predation, and disease have been documented • Strong circumstantial evidence exists that fisher have suffered dramatic habitat loss statewide (Zielinski et al. 2005) • Evidence that trapping and timber harvest caused fisher declines prior to Grinnell's surveys (review p. 26) • Emerging unpublished evidence that predation, mediated by habitat change may be limiting fisher recovery For a detailed description of this point see page 6 of Thompon and Green's letter.	Thompson and Green	DFG has concluded otherwise, in part because many of the significant factors that affected the fisher have been ameliorated, or conditions for the future of fisher have improved, for example: -No longer trapped for valuable fur. -No longer poisoned along with other carnivores. -Prey species no longer poisoned. -Changes in federal land mgt. Policy in the past 20-30 years aimed at protecting late seral forests. -Establishment of retention guidelines for hardwoods. -Establishment of wilderness areas and national monuments -Establishment of federal and state endangered species acts—incentives to keep species off the list. -Establishment of Board of Forestry and Forest Practice Rules. -Establishment of the California Environmental Quality Act - Establishment of the Southern Sierra Fisher Conservation Area -Increased study and investigation of fisher ecology, life history, and populations. -Increased information and investigation of fisher use of industrial timberlands. - Initiation of fisher translocation project in the northern Sierra Nevada. As indicated in the status review, the DFG provides many recommendations to further enhance the conditions for fisher in California. All of them could be done without listing the species. See also above comments to CSERC, CBI, and Zielinski regarding inferring the relationship between timber harvest history and fisher populations.
1	There is no standard for information sources established in the report. Speculative information and unpublished notes are treated at the same level or above peer reviewed science.	Keith Slauson	Both the Commission and DFG give high credence to published scientific information. The standard is that some of the information is peer-reviewed scientific information, while some is not.
2	The threats section fails to make a significant link between timber harvest-forestland management and predation.	Keith Slauson	DFG did cite 2 studies noted by Slauson, though did not expand on the Hoopa results. The Reno et al. 2008 data noted by Slauson is supportive of our general assessment that predation effects on fisher are potentially significant and warrant further study (pg's 49-50).

3	The logic used to call into question the occupancy state of the northern and central Sierra Nevada is without merit. For an example, if the central and northern Sierra Nevada region had 50 sample units, the probability of missing a fisher at every one of those sample units is =<0.001.	Keith Slauson	See p. 29. DFG could have been more explicit and provided more discussion. But, as noted, for purposes of the status review, DFG considered that no fishers were present but for the translocated individuals.
4	The document calls into question the choice of the word “decline” by the Truex et al. 2009 document, suggesting “change” might have been a better choice. The use of the word “decline” is clearly appropriate here and denoted a specific statistical choice in the design of the monitoring program.	Keith Slauson	see CBI #9 and Zielinski #4c.
5	The section on “Summary of Population Trend” fails to include the quantitative decline documented over a 10-year span from 1996-2006 on the Hoopa Reservation. A ‘potential’ short-term increase is given higher considerations than a quantitatively sound decreasing trend over a decade.	Keith Slauson	DFG updated the Hoopa population information from the petition evaluation that was based on the 2006 data, to the final report in 2009 that indicated the stable to increasing population.
6	The document cautions applying the population trend on the Hoopa Reservation to areas outside Hoopa. However, Hoopa does represent both the Douglas fir/tan oak portion of NW CA and a landscape with a moderate level of timber harvest intensity. Therefore Hoopa may fairly represent a larger portion of the NW CA population where these two conditions are similar.	Keith Slauson	One of the peer-reviewers was concerned about extrapolating beyond Hoopa and DFG concurs with that concern, although ultimately with additional data outside of Hoopa, the similarities (or not) can be determined. DFG is currently supporting ongoing fisher work on Hoopa, including predation studies, due in part to the landscape condition and geographic location, as stated here by Slauson.
7	The sentence, “data from Green Diamond lands suggest that fisher abundance did not decline during a similar period” demands a citation. The Green Diamond data should be presented and discussed in the prior section so the reader can fully appreciate what it is and how it can inform us.	Keith Slauson	DFG’s text in the Population Trend summary section could have repeated the text used earlier in the main body of the section. DFG presented, discussed, and cited the Green Diamond data on pages 32-33 (Diller et al. 2008). This discussion reads in part as follows: “Detection rates at segments increased slightly from 1994-2006” and “There was insufficient statistical power to detect a trend in these detection ratios (L. Diller, pers. comm.)”.