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UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF CALIFORNIA

ENVIRONMENTAL PROTECTION INFORMATION CENTER, et al, Plaintiffs, v. ANDREA TUTTLE, et al, Defendants.	Case No:00-0713-SC DECLARATION OF PETER B. MOYLE IN SUPPORT OF MOTION FOR PRELIMINARY INJUNCTION

I, Dr. Peter B. Moyle, do hereby declare as follows:

1. I am a fisheries biologist, and am considered by my peers to be an expert on the biology and status of coho salmon in California.

2. I have a B.S. in Zoology (Minnesota), an M.S. in Fisheries Biology (Cornell), and a Ph.D. in Zoology (Minnesota).

3. I have been conducting research on fish in California, including various species of salmon, since 1969. I have served as a Professor of Fisheries Biology at the University of California at Davis since 1972, and was chair of the University s Department of Wildlife, Fish and Conservation Biology for five years. I have authored or co-authored over 150 publications, including Inland Fishes of California, the standard reference work on California fishes, and four other books and monographs on fishes. My curriculum vitae and list of publications is attached to this declaration as Exhibit A.

4. I am a member of the American Fisheries Society, American Society of Ichthyologists and Herpetologists, Ecological Society of America, Society for Conservation Biology; American Association for the Advancement of Science, and American Institute of Biological Sciences. Recent awards include: Award of Excellence, Western Division, American Fisheries Society (1991); Haig-Brown Award, California Trout (1993); Distinguished Fellow, Gilbert Ichthyological Society (1993); Fellow, California Academy of Sciences (1993); Bay Education Award, Bay Institute (1994); Public Service Award, University of California, Davis (1995); Outstanding Educator Award, American Fisheries Society (1995, with J. J. Cech); Streamkeeper Award, Putah Creek Council (1997).

5. From the mid-1970s until the present, I have engaged in field studies of fish and fish habitat along the central and northern coast of California. These studies have included research on coho salmon and their habitat. I was in charge of a major survey of Eel River fishes from 1987-1991. I am presently part of a comprehensive U.C. Davis study of the Navarro River watershed, where I am leading a

study of the ecology and status of the watershed s fish, including coho salmon.

6. Although I have spent considerable time studying coastal streams and have a deep interest in coho salmon, my hands on contact with these fish has been limited because coho are largely gone from the large stream systems I have studied. In both the Eel and Navarro rivers, coho were historically found throughout the watersheds in forested streams but as the forests were logged, the salmon disappeared. For example, at the request of California s Department of Parks and Recreation, in the late 1980s Dr. Larry Brown and I spent time repeatedly sampling Bull Creek in Humboldt Redwoods State Park. This creek was once a major coho-spawning stream supporting annual runs perhaps as high as 10,000 fish. We failed to find a single juvenile coho in our samples. This watershed, prior to its acquisition as part of a state park, had a history of heavy logging, followed by landslides in the 1960s that sent huge amounts of sediment downstream, essentially burying the original streambed. In a survey of the Navarro River watershed last summer, we found juvenile salmon in just two tiny tributaries of the North Fork. They were absent from the few other places I had found them in the 1970s. It is observations like these that stimulated my interest in evaluating the status of coho salmon statewide.

7. I am frequently consulted by state and federal agencies for information and advice on fisheries management. In 1993, I was involved in efforts to evaluate the ecosystem management strategy, commonly referred to as the FEMAT (Federal Ecosystem Management Assessment Team) or Northwest Forest Plan, as part of a group that evaluated the effects of various alternatives on fish, including coho

salmon. Additionally, I was the head of the Delta Native Fishes Recovery Team (1993-1995, US Fish and Wildlife Service); a member of the Sierra Nevada Ecosystem Science Team (1994-1996, US Forest Service) and a member of the Core Team to write the Strategic Plan for the CALFED Ecological Restoration Program (1998). I am currently a member of the CALFED Interim Science Board for the ERP. I am also a fisheries consultant to the City and County of San Francisco, providing them with advice in relation to management of their water projects and land in relation to fish, especially salmon.

8. In 1991, under contract with the National Marine Fisheries Service (NMFS), Dr. Larry Brown and I undertook a review of existing information on the distribution and abundance of coho salmon in California. We published our findings in the North American Journal of Fisheries Management, a leading peer-reviewed professional journal. See Brown, L. R., P. B. Moyle, and R. M. Yoshiyama. 1994. Historical decline and current status of coho salmon in California. North American Journal of Fisheries Management 14:237-261, attached as Exhibit B. The National Marine Fisheries Service (NMFS) has relied extensively upon this research, calling our publication [t]he most comprehensive review of coho salmon in California. See 61 F.R. 56139.

9. Our studies indicated that wild coho salmon populations in California have declined by over 95% in the last 50 years, and that approximately half of all California streams that once supported runs of coho salmon no longer do so. We concluded that the sweeping declines of coho in California are primarily the result of decline in the quality of freshwater habitat throughout its range.

10. Our review concluded that degradation of freshwater habitat constitutes the single most significant cause of coho declines in central and northern California. These fish require clean, coarse gravel in which to spawn because successful incubation of salmon embryos requires that they be exposed to a continuous flow of well-oxygenated water. Any factor that increases sediment deposition in the gravel, through landslides or accelerated erosion from nearby land, will decrease survival of coho embryos by decreasing the supply oxygen. In addition to smothering salmon embryos, increased sediment loads can fill in or degrade pools in which juvenile coho salmon rear for their first summer of life. Fewer and smaller pools decrease survival of immature coho by eliminating or decreasing areas required for feeding, resting, and sheltering from predators or by reducing access to low temperature refuges found in deep pools. Cool water temperatures are an important component of summer habitat of coho salmon (optimal temperatures seem to be 12-14 degrees centigrade). Increases in water temperature increase mortality of salmon embryos and juveniles by making them more susceptible to diseases and predators, as well as through physical stress. Cool temperatures are maintained in most streams by shading from a dense canopy of trees and shrubs. Large fallen trees, or large woody debris (LWD) also help to shade streams, as well as providing important cover for small coho salmon, both directly and indirectly through the influence of LWD on stream processes which create more complex habitats. LWD is particularly important as a refuge for juvenile salmon during high winter flows. Decreases in incidence of LWD and other structural components of coho habitat reduce cover that protects juvenile coho from predators,

reduces thermal refugia, and reduces stream channel complexity. Absence of LWD also can increase velocities of flow that may scour out embryos buried in the gravel and push juvenile salmon into unfavorable habitats. Accordingly, streams with elevated temperatures, inadequate LWD, degraded banks, and less streamside vegetation experience significant decreases in survival of coho populations.

11. Conditions in intermittent and nonfish-bearing streams that are tributary to waterways inhabited by coho also can significantly affect coho survival. Such streams often comprise over 70 percent of the cumulative channel length in coastal California watersheds. These streams are important sources of water, nutrients, wood, and other vegetative material for streams inhabited by coho. On the other hand, these streams can also introduce harmful elements into areas inhabited by coho. Increases in sediment, high temperature water, and altered flow regimes in a watershed s intermittent and non-fish bearing stream network thus result in adverse impacts and associated increases in coho mortality similar to those described above.

12. The freshwater habitat characteristics required to maximize salmon survival are typical of streams in watersheds characterized by significant areas of mature and old-growth forests. Accordingly, our study described in paragraph 8 found that much of the decline of coho salmon stocks in California stems directly from widespread and ongoing elimination of old-growth and mature forest in watersheds along the California north coast. We ultimately concluded that coho salmon throughout California warrant protection as a threatened species under state and federal law.

13. In a status review of coho conducted for the National Marine Fisheries Service (NMFS), agency researchers concurred with the determination reached in the study mentioned in paragraph 8 that several coho ESUs in California warranted protection under the Endangered Species Act as they were either presently in danger of extinction or were likely to become endangered in the future if present trends continue. See Weitkamp, L.A., T. C. Wainwright, G. J. Bryant, G. B. Milner, D. J. Teel, R. G. Kope, and R. S. Waples. 1995. Status review of coho salmon from Washington, Oregon, and California. US Department of Commerce NOAA Technical Memorandum NMFS-NWFSC-24. 258 pp., summarized at 61 F.R. 56139 (1996). This review emphasized that one of the primary reasons for the extremely low levels of current coho abundance is extensive habitat degradation.

14. The California Department of Fish and Game (CDFG) contracted with me to produce a report on the status of native fishes in California whose populations have shown a declining trend, including coho salmon. CDFG published the final report. See P. B. Moyle, R. M. Yoshiyama, J. E. Williams, and E. D. Wikramanayake. 1995. Fish species of special concern in California. 2nd edition. Sacramento: California Department of Fish and Game. 272 pp. Prior to publication, the report went through extensive reviews by CDFG biologists, in both the first and second editions. We concluded in the report that logging and associated activities have caused substantial decline of coastal coho by increasing coho mortality through impacts such as those identified above resulting from habitat loss and degradation. CDFG now gives special consideration to all species of fish discussed in the report in carrying out the agency s

own management activities, as well as in its recommendations to other agencies.

15. Pursuant to a March 1998 Memorandum of Agreement (MOA) ~~between~~ signed with NMFS, ~~and~~ the Resources Agency of California committed to convening an independent Scientific Review Panel (SRP) to examine the CFPRs and their effectiveness in protecting coastal coho salmon. The Resources Agency further committed to implementing changes to the CFPRs that would remedy, by January 2000, shortcomings relating to coastal salmon identified by the SRP. ~~an independent Science Review Panel (SRP) analyzed links between logging activities carried out under the standards of California s state forest practice rules and effects on California coastal coho salmon. This body~~ The SRP published ~~a~~ its report in June 1999, the core finding of which was that the California Forest Practice Rules (CFPRs) do not provide sufficient habitat protection to watersheds inhabited by salmon to avoid increased mortality of these fish. The report found that logging operations which conform to state standards increase input of fine sediments into stream channels, increase water temperatures, affect aquatic food resources and reduce long-term recruitment of LWD, all of which act as limiting factors for populations of coho and other salmonids. A copy of the report is attached as Exhibit C.

16. The report mentioned in paragraph 15 also analyzed the document issued by the California Department of Forestry (CDF) titled, Coho Salmon (Oncorhynchus kisutch) Considerations for Timber Harvests Under the California Forest Practice Rules (Coho Considerations) (CDF 1997). The report concluded that although the CDF document provides general background information on the various factors that affect salmonids, it does not provide specific measures

that would result in the avoidance of take of coho salmon from direct, indirect, and cumulative effects. SRP report at 17. The National Marine Fisheries Service has also concluded that the CDF s Coho Considerations document does not contain measures that are adequate to prevent harm to coho salmon.

17. The ~~results~~ findings of the SRP report are consistent with conclusions I have drawn from my research. I am familiar with the requirements for regulating logging and associated activities set forth in the CFPRs, and I share the SRP s view that the CFPRs fail to provide standards governing logging and related activities such as road-building that would prevent these actions from causing direct and indirect mortality to coho salmon in coastal streams.

18. In my view, the CFPRs are particularly deficient in their failure to provide for consideration of cumulative impacts on salmon and their habitats; these are the combined impacts of past, present, and reasonably foreseeable future projects. Adverse effects to coho habitat typically result from the additive impacts caused by perturbations throughout an entire watershed. Moreover, stream-dwelling salmon have little ability to move to avoid degraded stream conditions. Based on my experience, it is largely meaningless to assess potential impacts on coho habitat resulting from a single activity in a watershed where there are multiple actions affecting coho habitat and a long history of past actions. Accordingly, I believe that absent ~~some type of~~ a scientifically based watershed level assessment process, the CFPRs cannot provide a decision-maker with adequate information to avoid adverse cumulative impacts on coho habitat and associated increases in coho mortality.

19. The Board of Forestry recently adopted changes to the CFPRs that will become effective in July 2000 and then expire on December 31, 2000. These changes are, in my view, largely cosmetic, and do not redress the problems the SRP, NMFS, state and federal agencies, or independent scientists have identified. Although the Board of Forestry inserted a great deal of laudible (though largely rhetorical) "intent" language into its revised Rules, the minimal modifications to the Rules substantive standards are insufficient to provide significant increases in current protections for coho or their habitat. For example, the problems relating to cumulative impact analysis discussed in the preceding paragraph were not even addressed, much less corrected, by the revisions adopted by the Board. Likewise, the Board of Forestry did not increase protection for nonfish-bearing and intermittent streams in the revised rules. In my professional opinion, I believe that habitat degradation caused by timber harvest and related activities permitted under the revised CFPRs will likely continue to impair the coho salmon's ability to feed, breed and shelter, resulting in death or injury to these fish.

20. Logging on federal land in northwestern California is conducted under standards developed by the Forest Ecosystem Management Assessment Team (FEMAT, July 1993), and set forth in the so-called Northwest Forest Plan. As noted above, I served on an advisory team that helped to evaluate the degree of protection to fish provided by various management options in this plan. My team basically concluded that stringent standards, as adopted by FEMAT, were needed to protect the fish. These standards establish Riparian Reserve buffers adjacent to both fish-bearing and non fish-bearing streams and waterways in order to provide fish habitat and riparian

protection. FEMAT standards and guidelines essentially prohibit timber harvest in Riparian Reserves on federal land, except in very limited circumstances. See Record of Decision, Northwest Forest Plan Standards and Guidelines, C-31. FEMAT recognized that wide stream-side buffers are critically important to maintain fully functioning riparian systems and protect stream habitat of salmonids, and set the no timber harvest buffer for most fish-bearing streams on federal land as the greatest of the following distances along a given stream: 300 feet slope distance, a distance equal to the height of two site potential trees, the top of the inner gorge, the outer edges of riparian vegetation, or the outer edges of the 100-year flood plain. Moreover, protective no-cut buffer widths for most non fish-bearing or intermittent streams on federal land extend 150 feet, the distance of one site potential tree, the top of the inner gorge, the outer edges of riparian vegetation, or the edge of the 100-year flood plain, whichever is greater. The Northwest Forest Plan also establishes a system of Key Watersheds with additional management standards to protect habitat of at-risk fish populations, as well as a watershed assessment process to assist managers in identifying cumulative impacts on Riparian Reserves.

21. Despite these standards for logging on federal land, there is no consensus among fisheries biologists that even the Northwest Forest Plan rules are adequate to prevent additional coho mortality in watersheds where harvest occurs. After consultations pursuant to the ESA on timber-related activities consistent with the Northwest Forest Plan s standards, the National Marine Fisheries Service routinely concludes that such activities still carry a risk of causing death or injury to listed salmonids. Therefore, though

the Northwest Forest Plan has specific provisions designed to protect aquatic ecosystems, particularly fish-bearing streams, NMFS issues incidental take statements for logging operations conducted in accordance with these federal standards and guidelines. In other words, NMFS recognizes that even when carried out under the standards established by the Northwest Forest Plan, logging operations result in death and injury to coho salmon.

22. The California Forest Practice Rules, both currently and as revised, provide standards that are significantly less protective than the standards applicable on federal lands. FEMAT noted this disparity and concluded that [c]urrent state forest practice rules do not adequately protect ecological effectiveness nor provide any margin for error to accommodate natural disturbances or uncertainties in knowledge. (FEMAT, V-61). The team focused on readily apparent differences between the existing state practice rules and the federal requirements. California allows significant logging and associated activities to occur within riparian areas. The width of the protective stream-side buffers are considerably smaller under the state rules. Id.

23. The current California rules only require a 75 foot buffer for slopes up to 30 percent, a 100 foot buffer for slopes between 30-50 percent, and a 150 foot buffer for slopes in excess of 50 percent for fish-bearing (Class I), streams. These requirements drop to 50, 75 and 100 feet, respectively, for streams that support aquatic life other than fish (Class II streams), and disappear altogether for intermittent (Class III) streams. In the revised rule package that will become effective in July, the standards for logging along fish-bearing streams are changed slightly, requiring a buffer

that is 150 feet in width. However, this buffer is still not of sufficient size to provide adequate protection for coho salmon, and harm to the fish and its habitat are likely to continue under this minor modification. Furthermore, under the revised rules, logging will continue to be allowed within the buffer of fish-bearing streams at levels that cause damage to the habitat of coho salmon, requiring only 75 percent of the overstory canopy to be retained within the first 75 feet from the watercourse, and only 65 percent within the remaining 75 feet of the buffer. The Board of Forestry elected to maintain the current insufficient standards for Class II and Class III streams. Thus, logging operations authorized under these slightly modified standards are likely to continue to increase sedimentation and temperature and cause the loss of large woody debris, resulting in continued harm and injury to coho salmon.

24. I believe that the ~~CFPRs~~ management standards under the current CFPRs for fish-bearing streams are insufficient to avoid detrimental impacts on coho habitat caused by logging and associated activities. Although the Board of Forestry has adopted changes to these standards, I believe these changes are also insufficient, and that such injurious impacts are likely to continue under these revised rules. Logging operations near fish-bearing streams ~~conducted in accordance with the~~ currently being approved under the CFPRs are likely to result in adverse modification of coho habitat by introducing sediment into streams, impairing delivery of LWD, destabilizing banks, altering runoff and flow regimes, and increasing stream temperatures. Such effects cause increased coho mortality by impairing freshwater habitat features coho require. Likewise, logging operations approved under the revised CFPRs are likely to

cause harm coho salmon and its habitat. I ~~also~~ view as telling the fact that major differences exist between the standards governing timber harvesting on federal lands versus harvests on state and private lands governed by the CFPRs, despite the fact these disparate land ownerships often occur in the same watershed~~, and despite the fact that the designated critical habitat of coho includes substantial areas of non-federal land~~. The fact that NMFS itself has determined that take still occurs under the more stringent federal standards bolsters my view that logging under the CFPRs has and will continue to harm coho salmon, and that this harm is likely to continue under the CFPRs that will become effective in July 2000.

25. In my opinion, the CFPRs also fail to adequately protect intermittent and nonfish-bearing streams. Functional watersheds and high quality fish habitat require maintaining connectivity of all parts of the aquatic ecosystem. Intermittent and non fish-bearing streams often comprise over 70 percent of the cumulative channel length in coastal California watersheds. These streams are sources of water, nutrients, wood, and other vegetative material for streams that are inhabited by coho. Failure to protect this stream network can result in the disruption and loss of functions and processes necessary for the maintenance of healthy coho habitat. Unprotected Class III streams are also likely to be a major source of sediment that washes into fish-bearing streams, harming even areas that are otherwise protected by riparian buffers. Existing state rules allow logging in riparian areas along nonfish-bearing and intermittent streams and consequently do not provide adequate protection again disruptions of the downstream habitats that support coho salmon. Logging along such streams in accord with the CFPRs is therefore

likely to adversely affect downstream coho habitat in a manner that causes increased coho mortality. As discussed above in paragraph 23, these standards will remain unchanged when revisions to the rules adopted by the Board take effect in July, and thus logging in accordance with these revised rules will likely continue to cause impacts that cumulatively, directly and indirectly increase coho mortality.

26. NMFS also concurs with my opinion that the CFPR s Watercourse and Lake Protection Zones (WLPZs) are simply inadequate to provide sufficient protection for coho. In the Federal Register notice publishing the final rule for the listing of the Central California coastal coho ESU, NMFS stated that there is no substantive body of evidence to demonstrate that the level of protection [provided by WLPZs] is sufficient to conserve the anadromous fish habitat and ecosystems upon which coho salmon in the Central California coast coho salmon ESU depend. 61 F.R. 56140. In addition, NMFS expressed concern that the CFPRs allow activities in the WLPZs that are harmful to coho habitat. Id. at 56141. These problems are further exacerbated by the fact that the CFPRs even contain exceptions that allow salvage without environmental review or monitoring. Id. Finally, the California Department of Fish and Game also concluded that the Rules do not protect the overall function, biological diversity, and integrity of stream corridors. California Department of Fish and Game, Evaluation of the Implementation and Effectiveness of the WLPZ Rules 1 (July 6, 1995), attached as Exhibit D.

27. The Rules adopted by the Board fail to address other severe problems found in the existing rules in addition to those

relating to riparian buffers. For example, ~~Additionally,~~ watershed analysis that assesses cumulative impacts is a major component of the federal regulations, yet is one of the areas most significantly deficient within the current CFPRs, and one that remains unchanged by the rule package recently adopted by the Board of Forestry. Watershed analysis under the both the current and the revised versions of the CFPRs relies on limited existing data and estimations, is site-specific and based on a smaller scale, and focuses on a much shorter time frame than watershed analysis under the Northwest Forest Plan.

28. NMFS concurs with my overall opinion that California s state rules have proven unsuccessful in preventing harm to coho salmon and their habitat. William Hogarth, former NMFS Regional Administrator, stated in October of 1997 that NMFS believes that scientific literature indicates that the habitat requirements of coho salmon and steelhead in most watersheds are not being met through the application of the [C]FPRs., attached as Exhibit E. Subsequent to this letter, NMFS performed a broad review of the CFPRs and found most of the CFPR provisions, and many of its definitions, inadequate to protect and avoid take of coho. National Marine Fisheries Service, Predecisional Draft, Effectiveness of the California Forest Practice Rules to Conserve Anadromous Salmonids, 2-3 (May 22, 1998)(hereinafter NMFS Review) attached as Exhibit F. Of twenty-nine provisions, the NMFS Review determined that twenty would not protect coho. Id. Additionally, in its publication of the final rule to list the Oregon/Northern California ESU of coho under the ESA, NMFS stated that the CFPRs do not adequately address large woody debris recruitment, streamside tree retention to maintain bank stability,

and canopy retention standards that assure stream temperatures are properly functioning for all life stages of coho salmon. Salvage logging operations and the insufficient monitoring efforts under the CFPRs are also cited as sources of problems. 62 F.R. 24596. On the issue of take, NMFS has consistently expressed concern that THPs promulgated in accordance with the CFPRs may, nonetheless, constitute take. In February of 1999, NMFS specifically stated in its Biological Opinion (BiOp) for the Pacific Lumber Company Headwaters Forest Project that the [i]mplementation of THPs under the CFPRs has not consistently provided protection against unauthorized take in relation to Pacific salmonids listed under the ESA by the NMFS, such as coho salmon. BiOp at 393, excerpts attached as Exhibit G.

29. NMFS also believed that CDF s Coho Considerations document (discussed in paragraph 16) did not include adequate standards to prevent harm to coho salmon. In a Biological Opinion issued by the agency, NMFS stated that [i]n April 1997, the CDF issued the document Coho Salmon Considerations for Timber Harvesting Under the CFPRs as guidance to foresters on how to address take of coho salmon. Although the this document provides guidance for protecting salmonids, it does not, in many instances, require measures that would avoid take of coho salmon from direct, indirect, and cumulative effects Until these issues are resolved, unauthorized take from direct, indirect, and cumulative effects of coho salmon from timber harvest and its associated activities may be occurring. [National Marine Fisheries Service, February 1999, Biological Opinion, Pacific Lumber Company Habitat Conservation Plan/Sustained Yield Plan for the Headwaters Forest Project at 393, Ex. G]

30. Moreover, in a recent letter, NMFS reiterated the inadequacy of the CFPRs in guarding against the take of coho salmon and the general failure of the California Board of Forestry to ameliorate this problem. NMFS stated that until the State of Caliornia can agree through appropriate Executive and/or Legislative action that a watershed based approach to approval of THPs is prudent, and until the FPRs address conservation of coho salmon, NMFS believes the survival and recovery of Federally listed coho salmon may be precluded... Letter from Rodney R. McInnis, Acting Regional Administrator, National Marine Fisheries Service, to Christopher P. Rowney, Executive Director, State Board of Forestry (Dec. 3, 1999), excerpts attached as Exhibit H. This statement is especially significant in that it indicates that not only does NMFS believe the CFPRs fail to prevent injury or mortality to coho salmon, but that the CFPRs impact coho salmon to an extent that they may even jeopardize the continued existence of the fish.

31. Finally, NMFS also concurs with my opinion that the rules adopted by the Board of Forestry are not adequate to address their shortcomings or the problems caused by logging authorized by the Department of Forestry. Speaking to these rule changes, NMFS asserted that "(t)he actions the Board took do not go far enough in providing for properly functioning riparian and aquatic habitat. Our position is supported by the Scientific Review Panel's Report of June 1999 and by the numerous scientific citations we have provide (the Board) as part of our testimony on the 'agency rule package' since July of 1999." See letter from Rodney R. McInnis, NMFS to Stan Dixon, Board of Forestry, March 30, 2000, attached as Exhibit X. Additionally, in a document jointly submitted by NMFS and the U.S.

Environmental Protection Agency, it states that " NMFS recognized that passage of the rules would not make the FPRs compliant with the federal Endangered Species Act " See California Coastal Nonpoint Program, NOAA/EPA Decisions on Conditions of Approval, April 26, 2000, attached as Exhibit X.

32. A personal experience with the taking prohibition of the ESA serves to illustrate the obvious need for the State of California to either modify its CFPRs in a manner which avoids take of coho, or alternately to seek authorization from NMFS to incidentally take these fish. I have a permit from NMFS that allows incidental take of juvenile coho salmon so I can conduct fish surveys in the Navarro River. The permit closely regulates the ways in which I can study juvenile coho salmon and confines my data gathering to observational techniques only. I am not allowed to use a standard sampling technique, electrofishing, because it is likely to injure a small percent of the fish captured. The permit goes so far as to regulate the number of juvenile coho salmon that I am allowed to observe by snorkeling in the stream because observing coho salmon in this manner can momentarily change their behavior and thus falls within NMFS definition of take of listed coho even though it is extremely unlikely that such observations will cause mortality. On the other hand, as demonstrated by the information presented in this declaration, logging conducted in accordance with existing California state rules has resulted, and is likely to continue to result, in death, injury, and disturbance of countless coho salmon. The state, however, has never sought permission to incidentally take coho.

33. The causes of coho decline in California have been multiple and interactive, but it is clear to me, based on personal

observations and analysis of the available literature, that logging and its associated activities carried out pursuant to the CFPRs have been the primary factor. A single logging event conducted in a watershed that has seen the cumulative effects of years of other adverse impacts can be the direct cause of extirpation of a local salmon run. The temporal component of a decline leading towards the extinction of a species is generally a considerably more lengthy one, however. Years of extensive timber harvest on private and state lands conducted in accordance with established California state rules and guidelines have modified and degraded coho habitat in a manner that has made it difficult for coho to persist in their native streams. It is my professional opinion that there is a direct connection between timber harvest practices which impair essential habitat for the freshwater life history stages of coho salmon and the rules under which those practices are carried out. California state forest practice rules have not only failed to protect the integrity of watersheds upon which the coho is dependent, but they have exacerbated the decline in population numbers such that extirpation of the natural populations of coho in California may be imminent. By not requiring sufficient protection of coho habitat, the CFPRs significantly affect the feeding, breeding and sheltering ability of coho alevins, parr (juveniles) and smolts, and are the ultimate cause of significant mortality to coho salmon. This is not likely to change when revisions to the CFPRs take effect in July 2000.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and could testify to them on the basis of my own personal knowledge.

Executed this ___ day of ~~April~~ May at Davis, California.

_____
PETER B. MOYLE, Ph.D