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Response to Comment C4-5

The status of fisheries resources in the Plan Area has been evaluated extensively. Baseline conditions, including current habitat conditions and-species status, are discussed in Master Response 1 and AHCP/CCAA Section 4. In particular, see AHCP/CCAA Section 4.3, which summarizes the data collection and assessments that were conducted to determine habitat conditions and the status of covered species. Additional details regarding the objectives, methods, results, discussions, and conclusions of the studies are presented in AHCP/CCAA Appendix C. Data on fishery resources was collected and included through 2000.

C4-5

Simpson Timber and its consultants have not been forthcoming with the status of fisheries resources on their property and as a result have not provided a basis to judge whether their HCP is working to protect the target species. I will document below case studies from streams on Simpson Timber land where populations have been severely impacted by land use.

Lower Klamath Tributaries: U.S. Fish and Wildlife Service (1990) studied Lower Klamath basin tributaries by running a downstream migrant trap. They found fish communities dominated by warm water species (Figure 2) as opposed to salmonids, which were the main species prior to disturbance from logging. Rankel (1979) found that Terwer Creek, along with Blue Creek, which is partially owned by the U.S. Forest Service, were the last major producers of chinook salmon in the Lower Klamath Basin and recommended protection for the former. Terwer runs underground (Figure 3), after 80% watershed disturbance by Simpson, and 14 of 17 Lower Klamath Basin tributaries also lacked surface flow when surveyed by the Yurok Tribe (Voight and Gale, 1998) (see Cumulative Watershed Effects section). Brown et al. (1994) characterized the Lower Klamath as follows: "Many of the lower tributaries in the Klamath drainage have been degraded by logging and road-building, and their coho salmon runs diminished. For example, surveys in 1989 failed to find coho salmon in Tully and Pine Creeks."

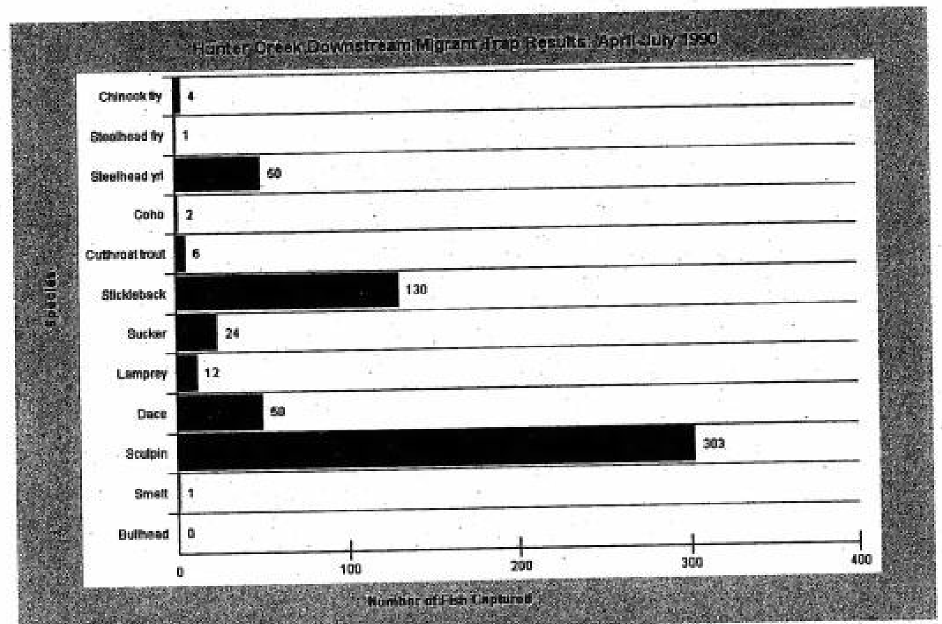

Figure 2. The downstream migrant trap results from Hunter Creek show extremely low numbers of salmonids, which is indicative of a shift in community structure in this creek to non-salmonids as a result of habitat loss. Data from USFWS (1990).

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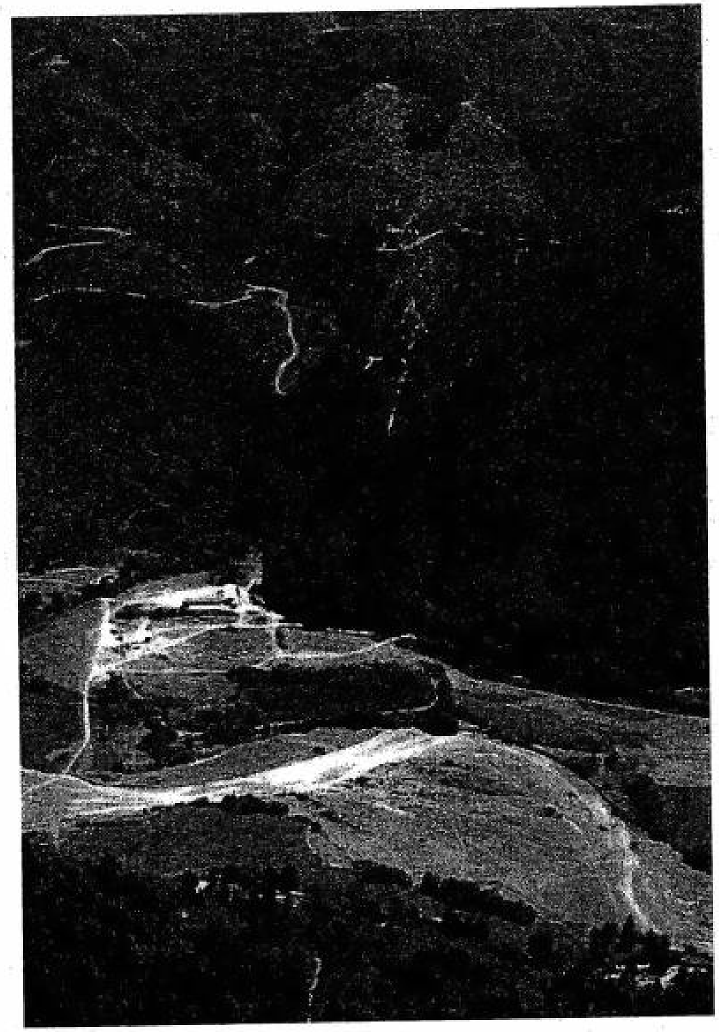

Figure 3. Lower Terwer Creek running underground in a reach that was prime coho and chinook salmon juvenile habitat (Rankel, 1979) prior to recent logging by Simpson (see Cumulative Effects section). Coats and Miller (1980) predicted likely cumulative watershed effects when just 32% of the basin had been logged.

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The *Mid-term Evaluation of the Klamath River Basin Fisheries Restoration Program* (Kier Assoc., 1999) noted that chinook salmon populations in Hunter Creek in the Lower Klamath were failing despite operation of a hatchery by the Yurok Tribe:

> "Fewer than 100 fall chinook salmon have returned to Hunter Creek in recent years and half of those were from the small scale rearing program operated on Hunter Creek. There is no baseline information on historic salmonid populations; however, Hallock (1952) marked thousands of juvenile coho in this stream. It would seem that highly disturbed watershed conditions are confounding recovery in Hunter Creek despite expenditures of the Task Force on both in-stream habitat improvement structures and artificial culture to aid in the recovery of this watershed."

Hunter Creek like Terwer Creek runs underground for several miles as a result of high sediment supply. Wilson Creek just to the north of the Lower Klamath has had similar watershed management by Simpson Timber to Hunter and Terwer creeks and runs underground in summer.

Redwood Creek: Prairie Creek in the Redwood Creek basin is largely protected by Redwood National and State Parks and provides a refugia for coho salmon. The mainstem of Redwood Creek, however, is severely aggraded and coho and summer steelhead are at very low levels in the watershed above Prairie Creek. The mainstem of lower Redwood Creek is so aggraded that it loses surface flow in summer. Landowners in Redwood Creek, including Simpson Timber, have operated a downstream migrant trap that shows chinook salmon and steelhead production is recovering in the upper Redwood Creek watershed (Sparkman, 2000). The lack of coho salmon in these traps, however, shows that habitat is not fully recovered. Also, there is a high risk that aggradation in upper reaches will recur as a result of cumulative effects (see Cumulative Watershed Effects section).

Lower Mad River/Canon Creek: Simpson Timber's extensive timber harvest of the lower Mad River since 1985 has caused significant and chronic turbidity of the Mad River, which I have personally witnessed as an angler. It is common for the Mad River to become too turbid to fish after early rains and to remain too muddy to fish for months unless there is a prolonged drought or a cold storm with snow fall and freezing temperatures. Turbidity is known to inhibit steelhead feeding and growth (Sigler et al., 1984) and it is likely that elevated turbidities caused by Simpson activities are negatively affecting all native salmonids with a life history requiring winter, mainstem use.

Canon Creek is a tributary of the Mad River upstream of Blue Lake, with substantial Simpson Timber ownership. This stream was a coho salmon index stream for the Pacific Fisheries Management Council (Larry Preston, personal communication) but lost its run of coho salmon as a result of habitat loss. Sediment evulsions from this watershed after extensive Simpson clear cutting and road building created a delta at the mouth of this stream which prevented coho from even entering in low flow years in the early 1990's.

Humboldt Bay Watersheds: Although there are no data for Simpson Timber owned watersheds in Humboldt Bay, recent studies by Pacific Lumber Company (2000) on Freshwater Creek provide insight into response of coho salmon and other species to high rates of cutting. Higgins (2001) noted patterns in downstream migrant trapping data in Cloney Gulch and McGarvey Creek, where coho salmon dropped by an order of magnitude after timber harvest in 80% and 50% of

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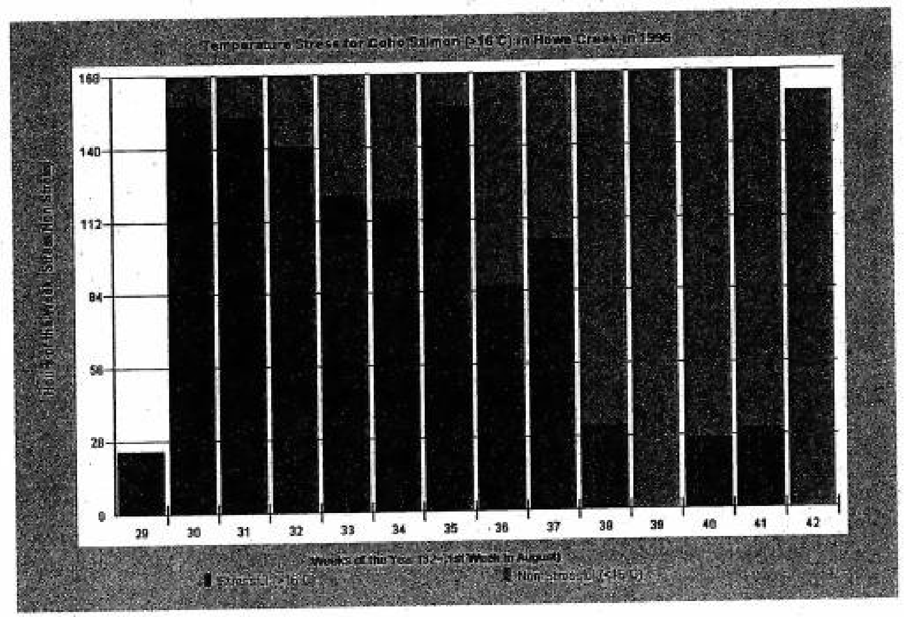
Response to Comment C4-6

The cumulative effects analysis is addressed in Master Response 3. This comment suggests that the Plan and EIS should: (1) expand the geographic scope of analysis to potential effects further downstream, (2) use disturbance indices to measure potential effects, (3) consider the additive effects of other landowners' land management activities; and (4) discuss timber harvest limits as a way to mitigate potential effects. The Plan and EIS establish analysis boundaries that are large enough to be meaningful to the resources at risk, and small enough not to dilute potential identified cumulative effects issues associated with the impacts of take resulting from the Covered Activities (see AHCP/CCAA Section 1.3.2, regarding the area where the Plan's monitoring provisions and adaptive management provisions are designed to measure, potential effects of the Covered Activities and modify the Operating Conservation Program as monitoring results demonstrate are necessary). The use of disturbance and other indices would provide a less comprehensive measure of potential effects (see Master Response 11). The Plan and EIS did take into account activities on other owners' properties within the 11 HPAs. Green Diamond considered activities on all privately-owned commercial timberlands within the 11 HPAs - regardless of ownership - that, over the life of the Plan, either are included within the Plan Area or eligible for inclusion in the Plan Area as provided in the Implementation Agreement. Regarding mitigation, the Plan's Operating Conservation Program satisfies the requirements of the ESA and implementing regulations. Implementation of the Operating Conservation Program will focus the Plan measures on the habitat characteristics determined to have the greatest affect on species survival and recovery in the Plan

these watersheds, respectively. Graham Gulch was so impacted by timber harvest and landslides that it produced only a few dozen juvenile salmonids over several months of trapping. It is likely that Simpson watersheds managed with equal intensity would yield a similar response.

<u>Howe Creek</u>: This Lower Eel tributary has lost its coho salmon and exhibits extreme, chronic high water temperatures (Figure 4), which make it unviable for the species. In fact coho salmon have been extirpated or nearly extirpated in the Lower Eel River, lower Van Duzen and Yager Creek as a result of excessive logging (Higgins, 1998). Howe Creek is characterized by the Aquatic HCP as properly functioning for temperature and no problems are acknowledged off Simpson's ownership. In fact Howe Creek has suffered debris torrents, which have dramatically changed the width to depth of the stream, resulting in the high water temperatures. The torrents also filled pools that will not scour out for decades.



C4-5 Figure 4. This chart shows the hours in the week above 16 degrees C, which is used as an indicator for the stressful range for coho salmon.

C4-6 **Cumulative Watershed Effects:** Both Ligon et al. (1999) and Dunne et al. (2001) recently found that California Forest Practice Rules were not preventing the decline of anadromous salmonid species nor were they adequately dealing with cumulative watershed effects. Similarly, the Simpson Aquatic HCP and Draft EIS do not discuss prudent limits for timber harvest, which is the crux of the cumulative effects issue, nor make use of essential indices of disturbance such as road densities. The documents do not consider influence of managed streams on larger downstream tributaries (Klamath, Mad, Eel and Redwood Creek), many of which are recognized as impaired under TMDL. It also fails to factor in land management by other owners.

Area. Under these circumstances, there is no basis to require different or additional measures to satisfy the ESA Section 10(a) approval criteria for ITPs and ESPs. The approval criteria are discussed in Master Response 8.

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Reeves et al. (1993) studied eight basins on the Oregon Coast that were less than 25% timber harvested and compared them to adjacent watersheds with higher timber harvest levels. They found that streams draining watersheds cut in over 25% of their area were usually dominated by one salmonid species, while basins with less disturbance maintained several species. Reeves et al. (1992) traced the root cause to channel simplification associated with pools filling in and large wood depletion.

Dunne et al. (2001) explain that large land surface disturbances, such as the recent extensive timber harvests surrounding and within Simpson Timber land, cause effects which are sometimes hard to quantify but known to occur:

> "Generally speaking, the larger the proportion of the land surface that is disturbed at any time, and the larger the proportion of the land that is sensitive to severe disturbance, the larger is the downstream impact. These land-surface and channel changes can: increase runoff, degrade water quality, and alter channel and riparian conditions to make them less favorable for a large number of species that are valued by society. The impacts are typically most severe along channels immediately downstream of land surface disturbances and at the junctions of tributaries, where the effects of disturbances on many upstream sites can interact."

Simpson Timber Company has timber harvest levels of over 80% of some basins within a 20-year period, such as **Terwer Creek** (Figure 5), **Hunter Creek** and **Wilson Creek**. Coats and Miller (1981) used Terwer Creek in the Lower Klamath Basin as a cumulative effects case-study, when harvesting in the basin had taken place in 32.5% of the basin and about 12% of its watershed area compacted by roads and landings:

> "Given the extent of recent soil disruption in Turwar Creek, the probability of continued timber harvest activities and the documented impacts in watersheds of comparable climate and geology, it appears that the stage has been set for significant accretion of sediment from hillslopes to tributaries and to the main channel of Turwar Creek. The timing of such impacts, however, depends to a large extent on the timing of future storm events."

Kier Associates (1999) found that: "The January 1997 flood transported very large quantities of gravel through lower Terwer Creek, negatively impacting private agricultural land and threatening a community water supply (Mark Meissner, NRCS Eureka)."

In adjacent Hunter Creek, which has a similar level of harvest and impacts to Terwer Creek, Kier Associates (1999) indicated that the streambed was so unstable that habitat restoration and rebuilding of chinook populations with a hatchery was failing:

> "Hopelain (in press) found that Hunter Creek has one of the lowest scores for habitat restoration success in northern California. High watershed disturbance is confounding habitat restoration efforts in the entire Lower Klamath Basin. The Yurok small-scale fish rearing program did not succeed in rebuilding salmon numbers because the stream habitat was too poor to support natural spawning."

C4-6

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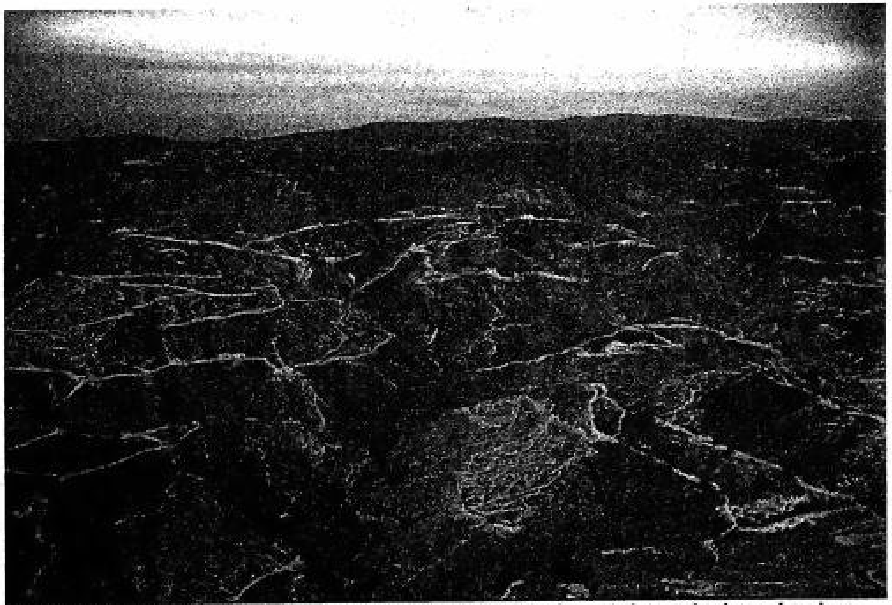


Figure 5. Terwer Creek from the air in 1990 after extensive clear cutting and salvage logging. Note steep terrain with high landslide risk and dense tractor skid trails on less steep slopes.

Other Simpson Timber tributaries of the lower Klamath were characterized by Kier Associates (1999) as follows:

> "Channels of most Lower Klamath tributaries have continued to fill in as sediment yield in the watersheds remains high. Timber harvest in all Lower Klamath watersheds exceeds cumulative effect thresholds and all streams (except upper Blue Creek) have been severely damaged during the evaluation period. Clear-cut timber harvest in riparian zones on the mainstem of lower **Blue Creek** and the mainstem Klamath River occurred in 1998 in inner gorge locations. Aggradation in salmon spawning reaches can be expected to persist for decades."

C4-6

> "Lower Blue Creek on private, industrial timber lands has been extensively logged, including in the riparian zone during the course of the Restoration Program (Figure 6); consequently, fish habitat has deteriorated since 1986. The channel of lower Blue Creek has widened substantially in response to an over-supply of sediment related to logging activities. USFWS (1993) has expressed concern over gravel quality and stability in lower Blue Creek with regard to survival of fall chinook salmon redds. The West Fork of Blue Creek has been heavily logged and has an extensive road network. Although a complete survey has not been conducted, weirs in the West Fork of Blue Creek were at least partially destroyed by the 1997 storm. Difficulty maintaining in-stream structures would be expected because most of the West Fork is in early seral conditions and there is an extensive un-maintained road network. Logging on private lands in inner gorge areas of lower Blue Creek was continuing during winter 1997."

Response to Comment C4-7

AHCP/CCAA Section 2.4 describes Green Diamond's Maximum Sustained Production (MSP) Plan, under which annual harvest levels are scheduled to "balance forest growth and timber harvest over a 100-year period and to achieve maximum sustained production of high quality timber products while protecting resource values such as water quality and wildlife." Since essentially all of Green Diamond's property has been harvested at some time in the past, the progress of timber harvesting across the ownership will reflect to some extent the pattern of age classes imprinted on the landscape by the timing of prior logging activity. Fifteen percent of the Plan Area is in forest types 60 years old and older, and the proportion of the area in these older age classes is expected to remain at this level or increase over the Plan term.

Timberlands managed by Green Diamond under the Plan will fall into two general categories: 1) RMZs, and 2) non-RMZ areas. Over time, timber stands associated with RMZs will become older and larger due to lack of intensive management.

In non-RMZ areas, operations conducted in compliance with an approved MSP plan, the Northern spotted owl (NSO) HCP (see AHCP/CCAA Section 1.4.3), AHCP/CCAA and California Forest Practice Rules (CFPRs; 14 CCR 895 *et seq.*) is expected to maintain a mosaic of timber stand ages over the Plan Area that will become more diverse in future decades. Watersheds with fewer age classes at present will tend to have a greater diversity of age classes in the future as timber harvesting activities will become spread over a greater percentage of the ownership in successive decades.

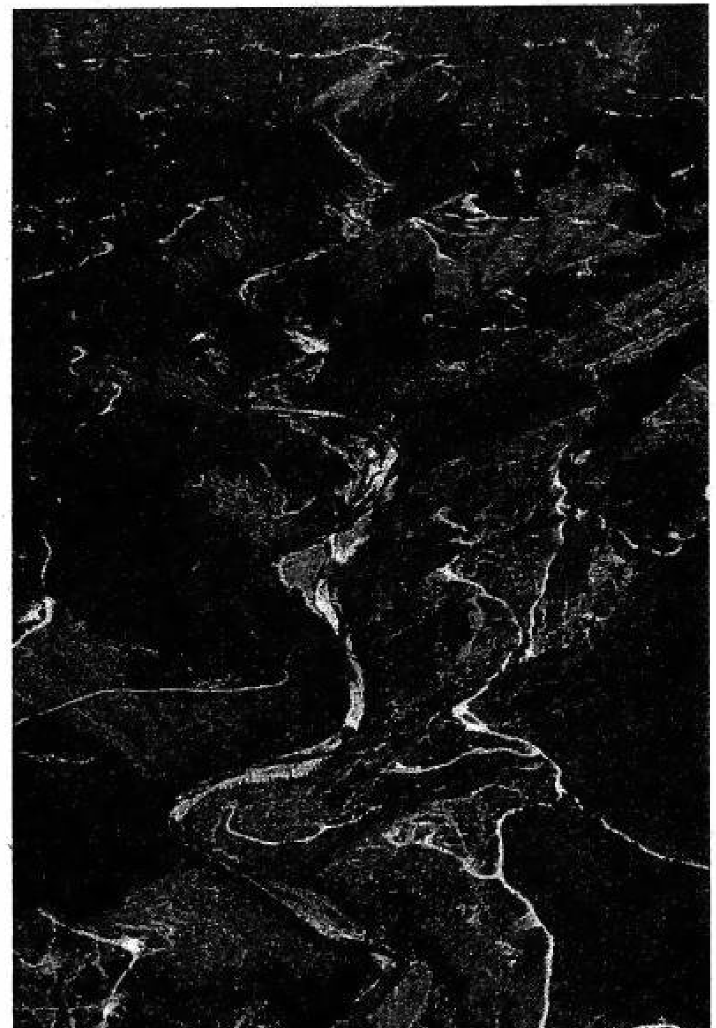


Figure 6. Inner gorge of Blue Creek in 1990 with clear cuts adjacent to the stream and a wide gravel bar signifying an over-supply of sediment from logging, landslides and failed roads.

C4-7 The Aquatic HCP data on age of trees show only 7% of the landscape in Simpson holdings in Blue Creek is in trees older than 60 years, and 25% of the trees are less than 20 years old (Figure 7). This indicates a very high disturbance index related to logging for the last 20 years and the previous 20 years was more intensive. Age class distribution of timber on Simpson's property as a whole indicate a similar conditions (Figure 8).

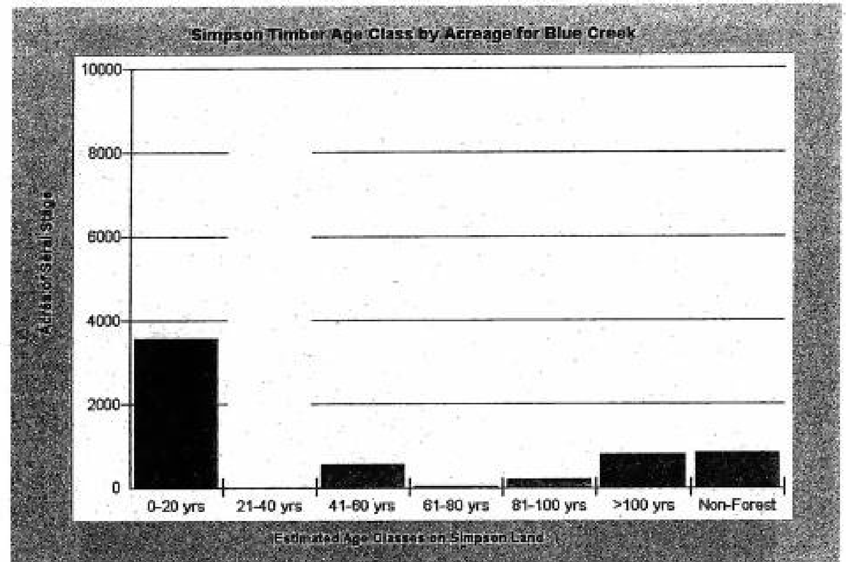
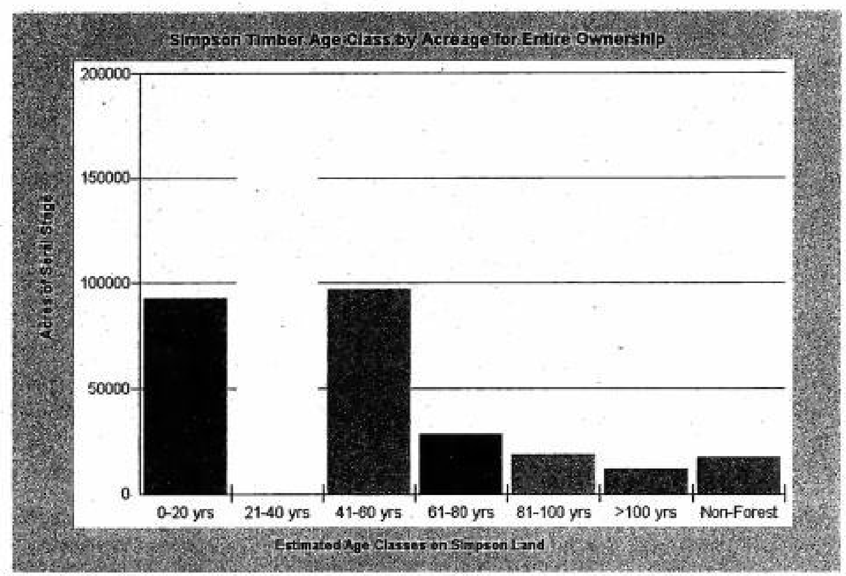


Figure 7. Distribution of age classes of timber in the Blue Creek drainage on Simpson's holdings. Note the lack of late seral trees or even those over 60 years. Data from HCP.



C4-7

Figure 8. The high proportion of young trees across Simpson's ownership indicates high rates of entry in recent years. There are few mature trees across the landscape on their ownership.

Response to Comment C4-8

The commenter referred to a workshop that was held on March 18 and 19, 1999. The statistician the commenter refers to presented mean bankfull widths for Cañon Creek, indicating that the mean bankfull width increased from 47.4 feet in 1995 to 62.1 feet in 1996. The statistician indicated that this statistically significant increase in mean bankfull width was a result of a large flood event with approximately a 10 year recurrence interval. The statistician did not indicate that, during the course of the study, the channel increased to 150 feet as the commenter indicated. The channel shift that occurred in the Mad River in 1998 has extended the low flow confluence of Cañon Creek further downstream which may limit early access of anadromous salmonids. However, data submitted by Green Diamond in support of its Plan indicates that since the 1996 flood event, anadromous salmonid access into Cañon Creek has occurred, including coho salmon, even in low flow years. See AHCP/CCAA Section 4.4.8.7.1.

Response to Comment C4-9

The Plan describes the major impact to salmonid diversity in the North Fork Mad River as a natural barrier low in the watershed that prevents access to all salmon and a high proportion of steelhead (see AHCP/CCAA Section 4.4.9). Below the barrier, the Plan documents runs of Chinook salmon in the mainstem and runs of coho salmon in Sullivan Gulch (one of the few accessible coho salmon streams in the North Fork watershed). Above the barrier, salmonid diversity is naturally low, but watershed health is indicated by high numbers of tailed frogs in many of the tributaries. These results are reported in the Headwaters

C4-8 **Canon Creek**, tributary of the lower Mad River, was discussed at a seminar on sediment sponsored by Simpson Timber and the National Marine Fisheries Service in 1999 at Humboldt State University. A statistician presented results of shifts in thalweg profiles in Canon Creek and showed a chart indicating that the width of the creek had gone from 50 feet wide to 150 feet wide during the course of the study. This type of channel change can take decades to recover (Lisle, 1981), and represents a major setback in carrying capacity for salmonids. The sediment transported through this reach, which caused the channel widening, formed a delta at the mouth, which prevents access to anadromous fish, including coho salmon, in low flow years.

C4-9 The portion of the **lower Mad River** owned by Simpson Timber Company has 31% of its forests harvested in the last 20 years, while 26% of stands less than that age are in the **North Fork Mad River** watershed (Figure 9). When a 40-year period is assessed for the North Fork, tree age data suggest that 49% of the watershed was logged over that time. This far exceeds thresholds recognized by Reeves et al. (1993) as likely to retain diverse salmonid communities. The disturbance levels in particular small sub-basins may be much higher (Figure 10). There are further problems in the North Fork Mad River from a forest health perspective (see Forest Health section).

C4-10 I have fished **Little River**, Humboldt County, since I moved here in 1972. Although Simpson Timber purchased land in this watershed after Louisiana Pacific had cut over 70% of the forest

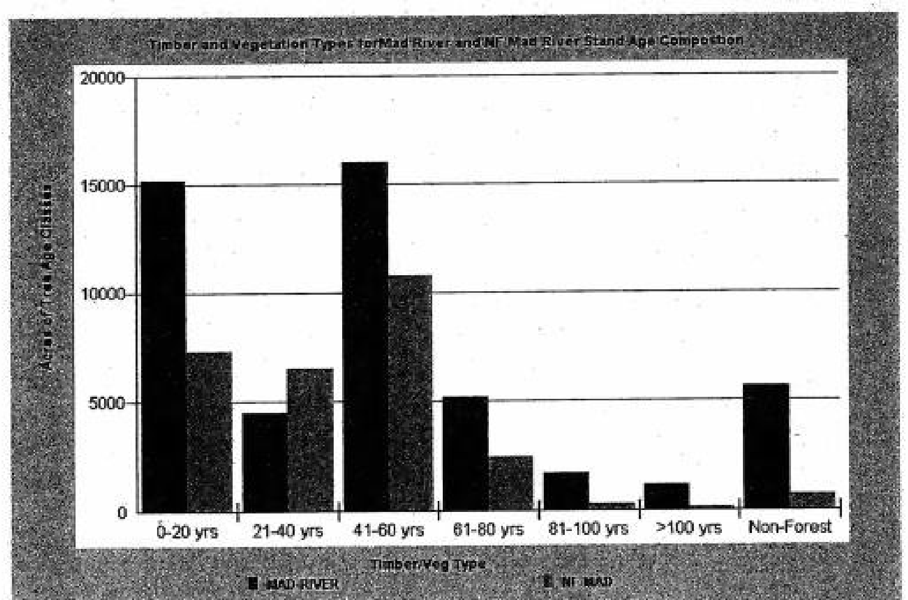


Figure 9. This chart of tree age classes of Simpson Timber holdings in lower Mad River and North Fork Mad River show a paucity of trees over 80 years old and indicate extensive timber harvest in recent decades, especially in the last two in Mad River.

Monitoring section in AHCP/CCAA Appendix C11. See generally Master Response 1, regarding baseline conditions in the Plan Area.

Response to Comment C4-10

The commenter describes a series of anecdotal observations as evidence for deterioration of the Little River watershed due to excess timber harvesting. However, these observations do not appear to be consistent with fish monitoring data that are provided in the Plan, which Simpson Timber Company, and later Simpson Resource Company, began gathering in 1998. In AHCP/CCAA Appendix C7 and C8, there are data on juvenile coho salmon and steelhead populations in the Lower and Upper South Forks and Railroad Creek in the Little River system. There are annual variations in the numbers, as would be expected for any anadromous salmonid run, but in general, the data suggest that Upper South Fork and Railroad Creek produce good numbers of steelhead, while Lower South Fork and Carson Creek have good numbers of coho salmon. The densities of coho salmon in these latter two creeks are comparable with data from Prairie Creek, which is a relatively pristine watershed.

These monitoring data indicate that there have been no impacts to the Little River watershed from past timber harvesting activities. However, the watershed conditions and processes are consistent with reproduction and survival in the freshwater habitat despite past impacts. Therefore, under the conservation measures proposed in the Plan, salmonid populations are expected to continue to persist, and potentially increase, following implementation of the conservation measures in the Plan.

Response to Comment C4-11

Harvesting activities by owners other than Green Diamond in Redwood Creek was considered in the EIS cumulative effects analysis. Regarding potential downstream effects on Redwood National Park, the Services believe the analysis is adequate for the reasons discussed in the response to Comment C4-6.

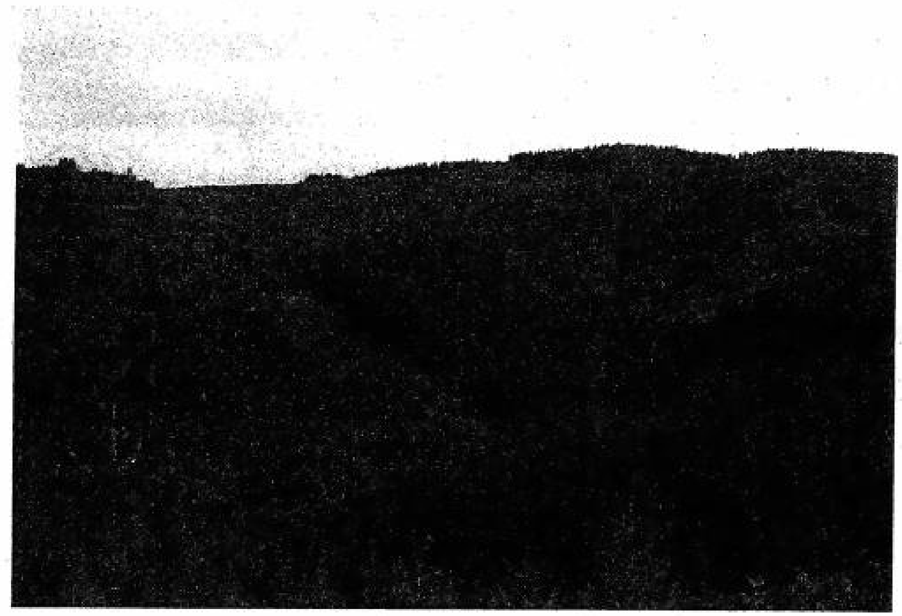


Figure 10. This photo shows the North Fork Mad River with large patch cuts amid over-stocked stands of 40-60 year old trees. Extensive clear cutting is likely to promote hydrologic change.

after 1985, they continue to harvest timber. I watched the stream go from a premier fishery for coho, steelhead, chinook and coastal cutthroat trout to one that is rarely fishable because of turbidity. The estuary, which was an excellent salmonid nursery and harbored adult cutthroat trout all summer, has filled in by at least six feet. I noticed that the bed of Little River below Crannel went from one with deep pockets to one with few areas over three feet deep. I also witnessed substantial fluctuation in bed elevation where a car body around which a pool was formed was three feet above grade the following year and sticking up in the air. Changes of this magnitude in bed elevation indicate high likelihood of redd scour (Nawa and Frissell, 1990). The flood frequency of Little River has increased substantially and even moderate rainfall with saturated ground swells Little River into the low lands above Highway 101. C4-10

C4-11 Simpson Timber Company has major holdings in **Redwood Creek**, which was well noted for the catastrophic sediment yield associated with the first wave of logging and the 1964 flood (Janda, 1977). While sediment yield in upper Redwood Creek has been reduced and the channel has cut down, extensive clear cutting and high road densities now are increasing risk that new evulsions will occur. Some Calwater Planning Watersheds in Redwood Creek have been harvested in over 60% of their area in just 15 years (Figure 11). The Minor Creek Calwater shown and harvest activity are largely by owners other than Simpson, but their activities also need to be added to HCP cumulative watershed effects discussions.

Response to Comment C4-12

See the response to Comment C4-6 where consideration of the geographic scope of analysis of downstream effects and the effects of other landowners' activities was discussed. See AHCP/CCAA Section 4.4.5 where the Redwood Creek estuary and its conditions have been described as part of the Redwood Creek HPA. The Services believe the scope of analysis was proper and that the Plan's measures appropriately address the commenter's concerns.

Response to Comment C4-13

The potential for increased peak flows and their relationship to the Plan's measures have been addressed in the AHCP/CCAA Section 7.2.1. EIS section 3.2.4.12 describes rain-on-snow areas located outside of the HPAs. The EIS considers and alternative (Alternative C) that includes 25,677 acres of rain-on-snow areas within Humboldt and Del Norte counties. Regarding consideration of other owners' activities, see the response to Comment C4-6. Regarding the potential for increased rain-on-snow events see EIS Chapter 3.

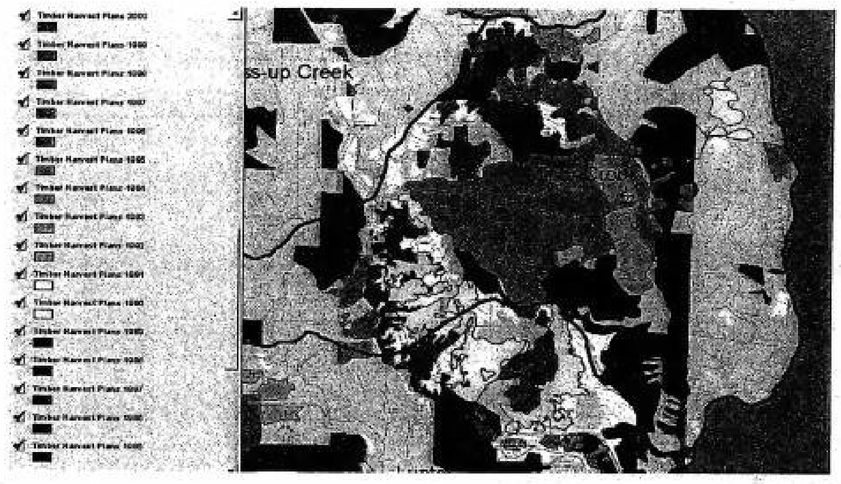


Figure 11. This shows the amount of logging in the Minor Creek Calwater Planning Watershed with disturbance of over 60% of the watershed in 15 years.

Cross sections and longitudinal profiles from Redwood National Park (Madej, 1999) show that the channel of lower Redwood Creek has filled as upper reaches in the watershed have recovered from the 1964 flood. The result is reaches of lower Redwood Creek losing surface flow, which greatly diminishes rearing habitat capability for salmonids (Figure 12). This change in the channel has made lower Redwood Creek unviable for spawning and has severely restricted summer steelhead habitat to just a few reaches in middle Redwood Creek. If a new wave of sediment is unleashed from land use activities in upslope areas, negative effects on fish populations will extend for decades. Channel filling may also cause loss of giant redwoods in
C4-11 Redwood National Park. Impacts to RNP are not properly covered in the HCP and DEIS.

The **Redwood Creek estuary** is recognized as a very important habitat for anadromous salmonids, but with its carrying capacity severely restricted due to sedimentation and levee construction (Anderson, 1999). Sediment that would affect lower Redwood Creek would also be
C4-12 flushed through the estuary. Consequently, the Aquatic HCP and DEIS should cover potential impacts of Simpson's activity, in combination with other land owners, to the estuary of Redwood Creek. It is likely that sediment problems and diminished salmonid carrying capacity for salmonids in the estuary would persist for decades in the event of another pulse of sediment.

C4-13 Simpson is also not dealing with potential rain on snow in the Redwood Creek basin and the additional potential of peak flows resulting from increased discharge from clear cuts (Harr, 1979). Simpson is using regeneration silviculture on ridges in Redwood Creek that make them more susceptible to build up of snowfall. Harr (1979) found that peak flow increases occurred when snowfall built up in clear cuts and melted with subsequent warm rain events. Snow falling in areas with canopy has greater chance for ablation. Recent past and planned clear cuts in Redwood Creek and high road densities further exacerbate the risk of extremely high peak flows and catastrophic channel changes. Other owners are showing similar patterns of land use.

Response to Comment C4-14

See Master Response 1, regarding the September 2002 Klamath River Die-Off of Fish. The commenter also is referred to the summer water temperature monitoring data shown in AHCP/CCAA Tables C5-3 and C5-4 for the Coastal Klamath and Blue Creek HPAs, respectively. These water temperature monitoring data, obtained from the late summer period (after August 15 when adult Chinook salmon may be present) at Green Diamond property sites on the tributaries to the lower Klamath River, indicate that except for one site, the maximum water temperatures have been less than 17° C. This data set clearly indicates that the water temperatures within these tributaries provide suitable refugee temperature for adult salmon should they choose to seek these refuge areas. Furthermore, access into these tributaries (e.g., sufficient water depth for passage of adult fish) is not solely dependant on flows from the tributaries, but is substantially co-dependent on flows in the mainstem of the Klamath River. The flows in the Klamath are controlled by flow releases determined by the Bureau of Reclamation at Iron Gate Dam, and not by any action that Green Diamond can affect. Therefore, the lack of tributary refuge habitat is a result of low late-summer streamflows and access from the mainstem Klamath River, not the lack of cool water habitat in the tributaries.

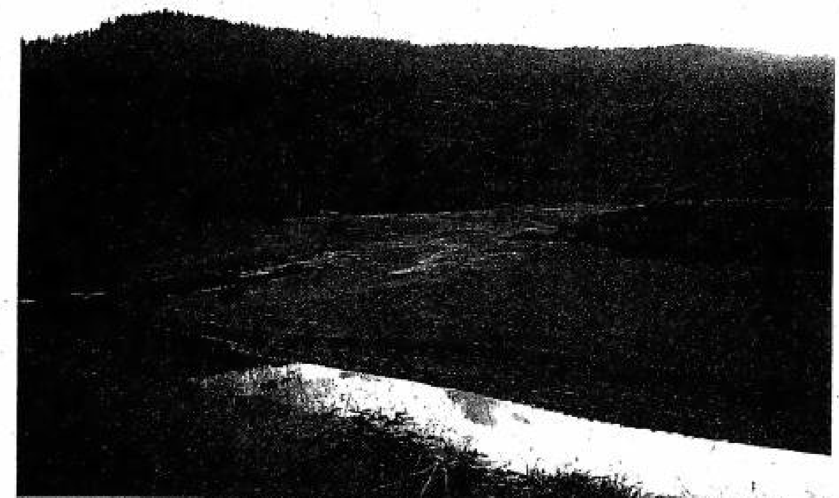


Figure 12. Lower Redwood Creek, above its convergence with Prairie Creek (at left) running dry as a result of major bedload transport. Loss of surface flows greatly reduces beneficial uses of water, including fisheries. Another wave of sediment generated by too much watershed disturbance would prolong this problem.

C4-13

C4-14

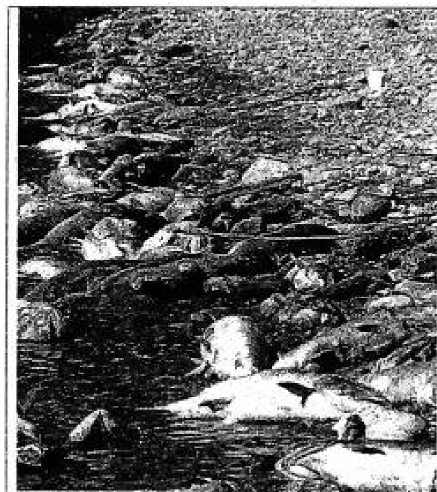


Figure 13. Lower Klamath, Sept. 2002.

Simpson Timber has very substantial cumulative effects on the **Lower Klamath River**. If each of the tributaries flowing from Simpson land had cool clear water and sufficient depth for adult salmonids to enter, then many of the 30,000 dead chinook, coho and steelhead (Figure 13) might have had a source of refuge. The mouth of Blue Creek had one pool with over 2,000 adult salmonids at the time of the fish kill (Craig Bell, personal communication). This tributary has extensive headwaters with ecological health because of United Stated Forest Service ownership. Voight and Gale (1998) found 14 of 17 tributaries in the Lower Klamath Basin lacked surface flows at their juncture with the Klamath. Most of these basins are managed wholly by Simpson.

Response to Comment C4-15

See Master Response 17 with regard to road density.

Regarding Green Diamond's plan for replacing culverts and upgrading or decommissioning roads, Green Diamond will implement the road implementation plan (AHCP/CCAA Section 6.2.3) across the entire Plan Area according to the priorities established in the Plan. Therefore, any culverts or roads within the Plan Area have the prospect of culvert replacement or road upgrading or decommissioning.

Response to Comment C4-16

The final product of the roads assessment and treatment prioritization will be an implementation plan that results in three classifications: temporarily decommissioning, permanent decommissioning, and road upgrading. As stated in AHCP/CCAA Section 6.3.3.2, over the term of the Plan and Permits, the mileage of management roads is expected to decrease as roads are decommissioned roads will increase. Also, every five years the entire classification system will be reviewed to ensure that management roads no longer needed for log transportation or administrative access are changed to the appropriate decommissioning status. See AHCP/CCAA Section 6.3.3.2.1. This implementation plan is expected to result in a larger number of decommissioned road miles during the term of the Plan than currently exists. Consequently, road density may be reduced over the term of the AHCP/CCAA.

The Plan explains that the emphasis on upgrading existing roads as opposed to road decommissioning reflects Green Diamond's

C4-15

Roads: Simpson owns 416,531 acres or roughly 650.4 square miles and has 3800 miles of roads or 5.84 mile per square mile (mi/sq mile) on their property as a whole. That figure does not address the skid trails (Figure 14), temporary roads or abandoned roads from previous waves of logging. The Aquatic HCP and Draft EIS do not address recommendations in Cedarholm et al. (1983) and NMFS (1996) that maximum road densities should not exceed 2.5 miles per square mile in order to maintain properly functioning watershed condition and to prevent harmful levels of fine sediment from entering streams. Road crossing failure is one of the principal sources of sediment (Hagans et al., 1986) and Simpson has no plan to replace culverts and upgrade or decommission roads except in watersheds where it plans further logging. Culverts have an expected life of 25 years and many culverts in inactive timberlands can be expected to fail. There are many watersheds where there are stacked culverts as roads criss-crossing drainages (Figure 15). These are the most dangerous as one blown crossing near a headwall brings other pipes and fill into a major debris torrent.

C4-16

Not only are there no targets for reduction of road density, the emphasis of the roads program is more on upgrading than decommissioning. Simpson admits that it will maintain only 45% percent of its roads annually, which poses a higher risk of crossing failure where trash may build up on culvert inlets or stream capture occur because of unmaintained drainage structures. *Since the road densities on Simpson land are about double recommended (NMFS, 1996) and twice what they can maintain, it suggests that their road density needs to be cut by half.*

Figure 14. Recent clear cut in Redwood Creek watershed showing extensive tractor skid trails or temporary haul roads, which are not considered part of the road network but do add to changes in hydrologic function.

management activities, which requires a majority of their existing roads to remain active to provide access for timber harvest over the next 20 years. The road management measures (AHCP/CCAA Section 6.2.3) are based on a risk assessment of an identification and prioritization of the potential for sediment delivery into watercourses. As stated in AHCP/CCAA Section 6.3.3.8, an initial estimate of approximately 45 percent of all roads will be routinely maintained annually following inspection each year. Maintenance will follow a 3-year rotating schedule. However, the actual annual percentage of roads that are maintained will increase over time due to planned decommissioning. Any increased risk of crossing failures from debris accumulated at culverts or stream capture along roads would be minimized by road upgrading measures and routine road maintenance. Routine road inspections will assess the effectiveness and condition of all erosion control and drainage structures. As stated in AHCP/CCAA Section 6.2.3.9, Green Diamond will prioritize repairs that are needed based on treatment immediacy. These measures will help minimize the risks for sediment delivery from road crossings, a goal of the implementation plan.

Moreover, the Services expect that, the potential for sediment delivery to the watercourse, as a result of the road implementation plan, will be greatly reduced. Therefore, notwithstanding the commenter's indications that road density limitations would be a superior measure for mitigating and minimizing the effects of sediment (see Master Response 17), the Services believe that the measures selected by Green Diamond are acceptable under Permit issuance criteria discussed in AHCP/CCAA Section 1.4.1, EIS section 1.3 and Master Response 8.

Response to Comment C4-17

See Master Response 18, regarding riparian widths. IN addition, the Services considered an alternative similar to the Northwest Forest Plan (EIS section 2.6) but eliminated it from further consideration. Further, the relationship of the Operating Conservation Program and the CFPRs is discussed in Master Response 7.

Response to Comment C4-18

See Master Response 18.

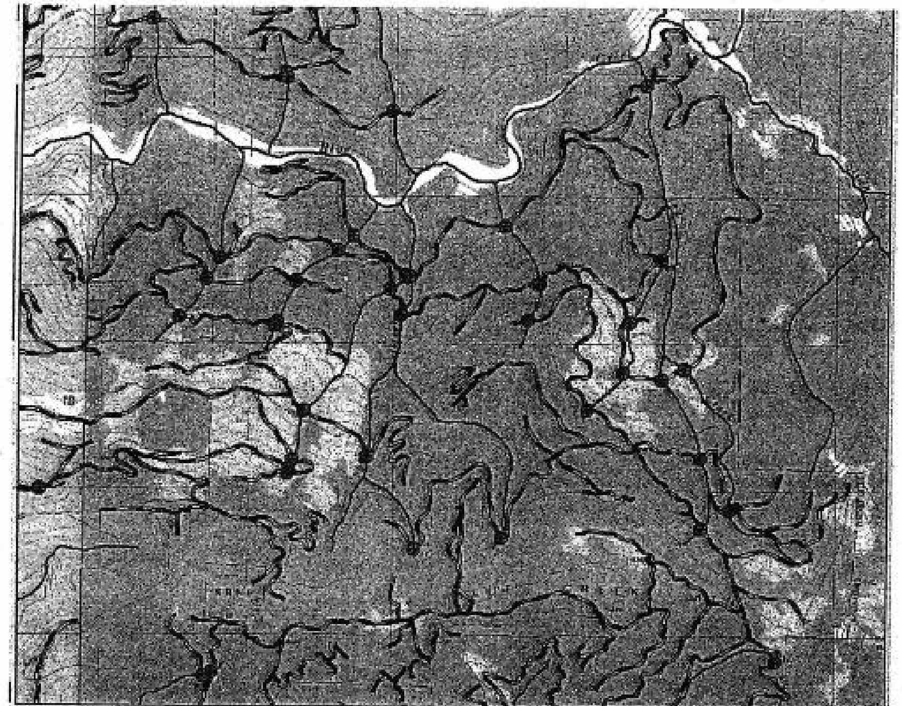


Figure 15. This USGS topographic map is overlaid with hydrology and timber haul roads in middle reaches of Blue Creek on Simpson Timber land. There are many mid-slope roads and roads crossing headwalls, which have high failure risk. Stacked roads pose risk of multiple crossing failures. All these roads except those on ridges should be decommissioned.

C4-17 **Riparian Conditions**: The Aquatic HCP and Draft EIS confuse canopy and riparian health and function (Chen, 1991). Science associated with the Northwest Forest Plan (FEMAT, 1993) indicates that the zone of riparian influence is two site potential tree heights or more (Figure 16). In fact water temperature buffering, in the form of cool air temperatures and high humidity over the stream, rapidly deteriorates under one site potential tree height protection, which in redwood country is 200 feet or more (Spence et al. (1996). Consequently, the riparian buffers and management plans are fundamentally flawed. The Aquatic HCP ignores best science on this issue and continues to promote harvest of large trees in riparian zones. Harvest restrictions are only equal to, if not less than, those required under the California FPRs (Table 2).

C4-18 The protection for streamside areas is extremely inadequate when contrasted with the scientific assessment of riparian function from Federal scientists in the FEMAT (1993). They recommended protection of two site potential tree heights on perennial streams and one site potential tree height on ephemeral streams. Figure 17 shows how Bartholow (1989)

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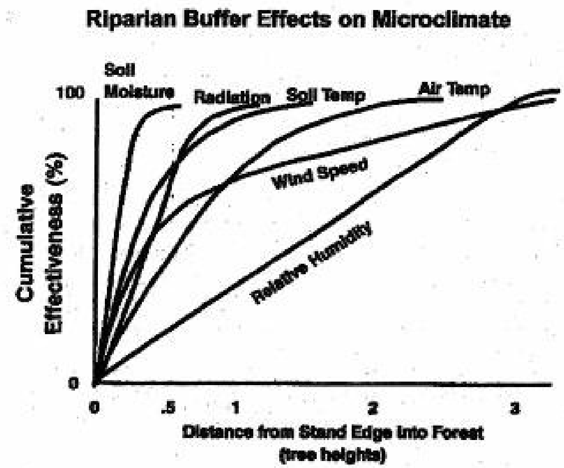

Figure 16. Chart based on Chen (1991) taken from FEMAT (1993) showing that riparian function drops off rapidly inside one site potential tree height. Simpson proposes only 50 foot no cut zones with some protection out to 150', which is less than one site potential tree height.

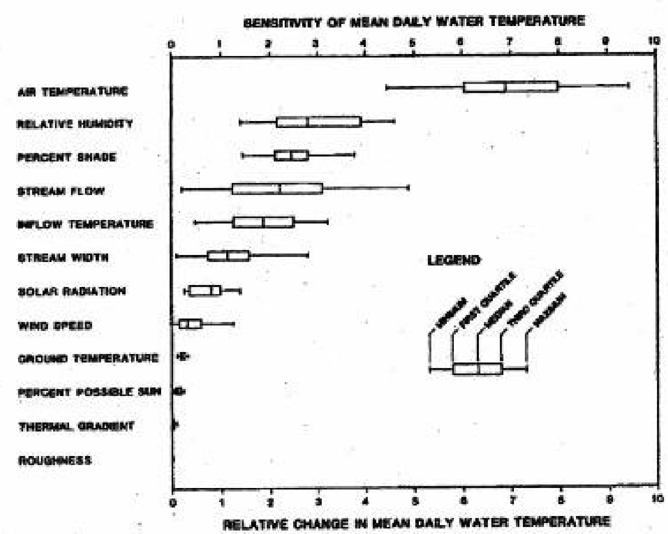

Figure 17. This chart taken from Bartholow (1989) shows the order of influence of factors on mean daily water temperature, with air temperature having the greatest impact followed by relative humidity and shade.

<u>Response to Comment C4-19</u>

The cool coastal climate throughout most of the Plan Area diminishes the impacts of harvesting and other covered activities on riparian micro-climate and water temperatures. The evidence contained within the Plan indicates that water temperatures Plan Area streamsare generally currently suitable for all the covered activities. The Plan provides that only a single entry into RMZs to harvest trees during the life of the Permits for both Class I and II watercourses is allowed (with the exception of adding cable yarding corridors for intermediate treatments-see the response to Comment S1-15). Only a small proportion of the trees within the RMZs will be harvested (85 percent overstory retention in inner zone and 70 percent overstory in the outer), and those trees remaining will continue to age throughout the term of the Plan. In addition, the AHCP/CCAA Section 6.2.1 has provisions for not harvesting trees within Class I and Class II RMZs that meet the "likelihood to recruit" criteria (see Master Response 5). By the end of the Permit term (50 years), the Plan projects that over one third of the stands comprising the RMZs will be greater than 100 years old and the remainder will be between 51-100 years.

AHCP/CCAA Section 7.2.3.3 provides and analysis of the condition of the RMZs at the end of the Permit terms. The Services believe that, collectively, the conservation measures for the RMZ's will encourage retention of larger diameter trees, which in turn will provide additional conifer cover and ensure riparian shade and canopy for the protection of riparian micro-climate and water temperatures.

C4-18

demonstrated that mean daily water temperature is influenced most by air temperature over the stream, then relative humidity and shade, respectively. This well recognized relationship of air temperature and water temperature (Poole and Berman, 2000; Essig, 1999) is ignored in the Aquatic HCP and Draft EIS.

C4-19

The Aquatic HCP and Draft EIS use stream shade or canopy as if they were the main governor of water temperature, when they are not. Data provided in the Aquatic HCP shows that even canopy is fairly open on some reaches of streams in Simpson's ownership and the amount of shade provided by conifers is very low in most cases (Figure 18). This is consistent with the findings from Landsat (Figure 19), which shows that mostly small diameter trees dominate the 90 meter buffer zone. These small diameter trees are often hardwoods. A canopy of hardwoods often signifies that the overstory of conifers have been removed, opening air flow and the chance for stream warming. Hardwoods also offer very little value as habitat structures when recruited to the stream, because they only last about five years before rotting (Cedarholm et al., 1997).

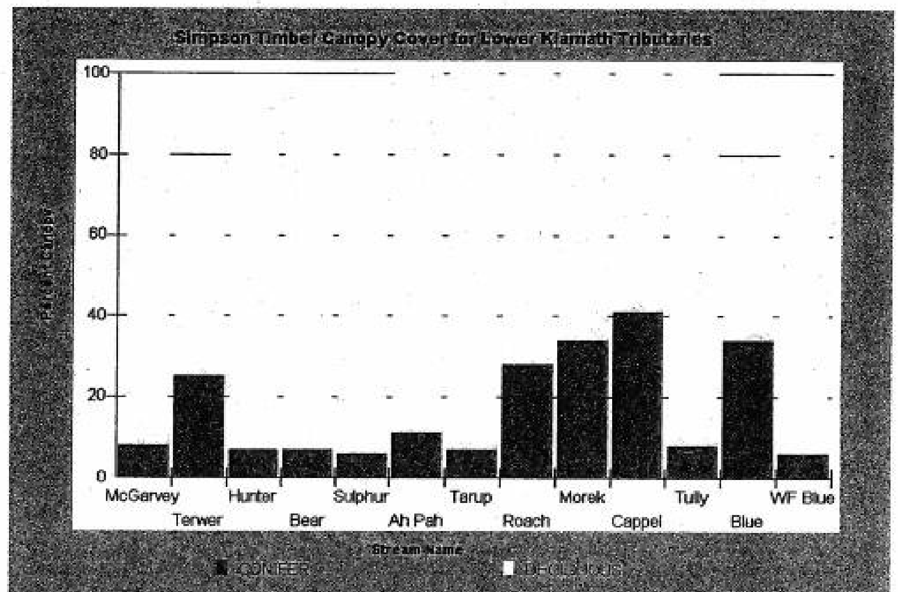

Figure 18. This figure takes canopy measurements of Lower Klamath tributaries taken from the Simpson Aquatic HCP. All of these streams show major signs of riparian logging and have depleted conditions relative to potential recruitment of conifers into the stream channel.

The riparian zones on Simpson Timber lands are as lacking in large trees similar to upland conditions, as shown by their data of tree age classes (Figure 8). Landsat imagery from 1994 as interpreted by Dr. Larry Fox at Humboldt State University shows that there are almost no late seral trees in the riparian zone of Lower Klamath tributaries (Derksen et al., 1996). Figure 19 shows vegetation and size of trees in a 90-meter buffer the riparian zone in lower Blue Creek and the West Fork Blue Creek. The Landsat has a 30-meter resolution and may miss individual trees,

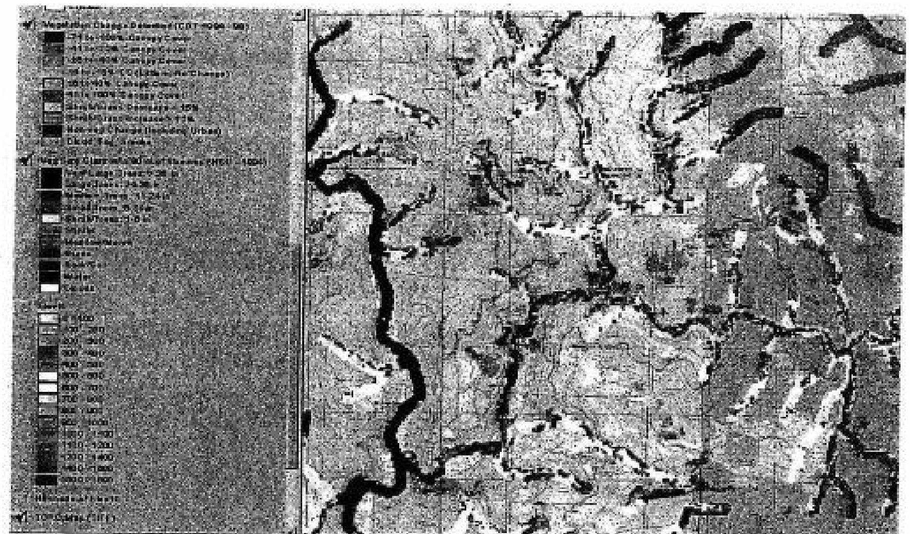

Figure 19. This map shows the 90 meter riparian buffer for lower Blue Creek and the West Fork Blue Creek (upper center) with the zone dominated by trees less than 12 inches in diameter. Change scene detection shows removal of trees in riparian zones or in inner gorge areas.

but most of the riparian zone is in very early seral conditions with the majority of trees under 12 inches. This indicates that large wood supply in these reaches is likely to be hindered for 50-100 years as conifers grow large enough to provide lasting value as habitat elements in streams. The 1994-1998 change scene detection overlay on the map shows significant tree removal in riparian zones and in uplands immediately adjacent. Large conifers may last decades or even hundreds of years, in the case of old growth redwood. Simpson plans far less protection for riparian zones than recommended for ecosystem function in FEMAT (1993) (Table 2). In light of the current conditions in Simpson's riparian zones, there should be no harvest of large diameter trees out to 200 feet for at least 50 years.

Stream Class	FEMAT	Simpson	Simpson No-Cut
Class I	360-400	150	50-70
Class II	360-400	70-100	30
Class III	180-200	30	0-30

Table 2. The CDF stream classification refers to perennial streams with fish (Class I) and without (Class II) and ephemeral streams (Class III). The FEMAT distances for site potential tree heights reflect the taller trees expected in redwood forests (Spence et al., 1996). The Aquatic HCP tiers cuts inside bands within their riparian management zones.

C4-19

Response to Comment C4-20

The goal of the slope stability conservation measures is "to reduce management related sediment delivery to the aquatic system from landslides and landslide related erosion that might occur in specific portions of the landscape." (See AHCP/CCAA Section 6.3.2.1.). A discussion of the relative effectiveness of silvicultural prescriptions on slope stability is provided in AHCP/CCAA Appendix F1 and the modeled effectiveness of the slope stability conservation measures is shown in AHCP/CCAA Table F3-8. Data from the Plan Area has been reviewed through the steep streamside slope (SSS) assessment and the mass wasting assessment, to estimate the expected effectiveness of the various prescriptions and the relationship between timber management and mass wasting, as described in AHCP/CCAA Sections D.3.4 and D.3.5. See response to Comment J1-19 regarding the SSS pilot study and the response to Comment S5-77 regarding the mass wasting assessment pilot study.

The slope stability conservation measures include the use of SHALSTAB as a screening tool to aid in identifying terrain that may include headwall swales (AHCP/CCAA Section 6.2.2.2.1). SHALSTAB itself, however, does not identify headwall swales. Headwall swales only can be identified through direct field observation, regardless of whether the landform occurs inside or outside a SHALSTAB area. A selection silvicultural method is the proposed default prescription for field verified headwall swales rather than complete avoidance (AHCP/CCAA Section 6.2.2.2.3).

C4-20

Disturbance of Steep Slopes and Sediment Yield: The Aquatic HCP and Draft EIS recognize unstable areas but then fail to make appropriate prescriptions. The inner gorge zones are recognized as unstable but restrictions on harvest do not rise to the break in slope but only arbitrary distances, depending on stream class. Roads will still be allowed to be built across high risk geomorphic features, such as headwater swales and slides, if there is no other "feasible" path for the road. Timber harvest will still be taking place in inner gorges, at headwalls and within 25 to 50 feet from the top of active slides. The whole system of sediment prevention from mass wasting rests on the opinion of a licensed engineering geologist (in the company's employ). This is the same system that has been used under California FPRs and has been shown to be an abysmal failure in preventing sediment yield on Simpson's land and elsewhere (Pacific Watershed Associates, 1998).

The harvest of trees on steep slopes destabilizes them, increasing the risk of landslides. When slides occur, they lack large wood and, therefore, cause extensive damage to streams due to long run out distances of debris torrents (PWA, 1998). The Aquatic HCP should have to use and share results from the shallow landslide stability model (SHALSTAB) (Deitrich et al., 1998), which gauges the risk of slope failure. The Fox Unit Study on the South Fork Smith River (LaVen et al., 1974) showed that harvest of timber on unstable lands, particularly inner gorges, leads to a huge increase in sediment yield. Simpson Timber has already disturbed numerous slopes with high risk of failure (Figure 4). Sediment yield after timber harvest or road building may have a lag time before contributing sediment to streams (Frissell, 1992). Inner gorge areas and those shown as high risk zones by SHALSTAB should be completely avoided, with no timber harvest or road building.

C4-21

Effects of Sediment on Aquatic Habitat: A very major deficiency of the Aquatic HCP and Draft EIS are their failure to discuss the linkage of sediment yield, due to harvest and road building activities, and subsequent impacts on aquatic habitat downstream. Reeves et al. (1993) had the following findings in paired comparisons in Oregon Coastal basins with greater or less than 25% prior timber harvesting:

> "Stream habitats in basins with low timber harvest levels were more diverse than habitats in basins with high levels of harvest. In the paired comparisons, streams in low-harvest basins had significantly more pieces of wood per 100 m – 2 1/2 times more than streams in high-harvest basins. Streams in low-harvest basins also had 10 to 47% more pools per 100 m than did streams in high harvest basins."

Harvest of between 50-80% of Freshwater Creek sub-basins caused a major decrease in pool frequency and depth, and a simultaneous decrease in coho juvenile production (Higgins, 2001). Results from V* in upper Freshwater Creek showed pools filled from roughly 15-20% filled in 1992-93 and 46% filled in 1999, after more than 40% of the basin was logged. Similar patterns of loss of pool frequency and depth after logging are also evident in the Noyo, Ten Mile, Big and Gualala rivers in Mendocino county after extensive logging (IFR, 2000; 2002; In review). The loss of pool habitat was associated with loss of coho salmon or their diminishment in all the aforementioned basins. Brown et al. (1994) noted the following about why coho had declined in California:

> "Optimal habitat for juveniles seems to be deep pools (>1 m) containing logs, root wads, or boulders in heavily shaded sections of stream. These habitat characteristics are typical

Response to Comment C4-21

AHCP/CCAA Section 5.3 specifically addresses the "linkage" requested by the commenter-the potential for increased sediment input due to harvest and road building activities.

AHCP/CCAA Section 6.2.5 provides a description of the measures proposed to monitor the effectiveness of the reduction in sediment delivery from road-related sources.

Specific protocols for monitoring the effects of sediment delivery on aquatic habitats are outlined in AHCP/CCAA Appendix D. These include: D.1.5 Road Related Sediment Delivery (Turbidity) Monitoring; D.2.2 Channel Monitoring; and D.3.6 Long-term Habitat Assessments. Green Diamond's fish habitat data are presented in AHCP/CCAA Appendix C (specifically Appendices C1 and C2 for habitat information and C3 for thalweg profiles and channel widths analyzed to date).

Because these studies will continue under the AHCP/CCAA (see Section 6.2.5) additional habitat information will be generated and provided in the biennial reports prepared and submitted to the Services (see AHCP/CCAA Section 6.2.7.3).

Response to Comment C4-22

Regarding consideration of existing conditions, including "legacy" conditions, see Master Response 1. Briefly, however, legacy conditions are those that exist prior to the Proposed Action, and have been considered in this analysis as part of the existing baseline condition.

The criteria for issuance of these permits is discussed in EIS section 1.3, AHCP/CCAA Section 1.4.1 and Master Response 8. The ESA does not require that a Plan actually result in recovery. For ESPs, the ESA requires that the CCAA contribute to efforts to preclude or avoid the need to list the species by providing early conservation benefits. Implementation of the Operating Conservation Program will contribute to recovery efforts for ESP species by providing benefits that, when combined with the benefits that would be achieved if it is assumed that conservation measures were also implemented on other necessary properties, would preclude or avoid any need to list those species. The Operating Conservation Program will concentrate efforts and resources on the habitat conditions or factors that are limiting for the covered species which have been discussed in AHCP/CCAA Sections 1.3.3 and 4) in each of the HPAs.

For more information on how effects, including cumulative effects, were addressed in the AHCP/CCAA and EIS, see Master Response 3.

Response to Comment C4-23

Summaries of the scientific data analyzed and used in developing the Plan are included in AHCP/CCAA Section 4 and full details of

of streams in old-growth forests, and for that reason, the decline of coho salmon stocks in California can be tied to the widespread elimination of old-growth forest on the California north coast."

C4-21 Simpson Timber Company has collected data on fish habitat and measures of bed change, such as cross sections and longitudinal profiles, and should be made to share it openly as part of their Aquatic HCP. Average and maximum pool depth need to be monitored over time to gauge recovery (see Monitoring section).

C4-22 **Restoration and Salmonid Recovery**: In order to recover coho salmon and other Pacific salmon species, restoration needs to be targeted in areas adjacent to existing refugia to expand them and protect gene resources and allow for colonization of healthy stocks into restored watersheds (Bradbury et al., 1996). The Aquatic HCP gives priority to road maintenance and decommissioning to watersheds where Simpson will be actively logging. If the HCP were following a science based strategy for recovery of coho, it would protect those watersheds in the company's holdings where they are most abundant. This strategy would target road decommissioning in the West Fork of Blue Creek and their other holdings in middle and lower Blue Creek. Blue Creek is recognized as a refugia by the USFS and has been given Key Watershed status under the Northwest Forest Plan (FEMAT Aquatic Conservation Strategy, 1993). Voight and Gale (1998) found the highest densities of coho in the Lower Klamath Basin in the Crescent City Fork of Blue Creek.

The Little River has been known as a coho salmon producer and also has a strain of large, short-run coastal chinook, which is not found in many other watersheds. Simpson in combination with the former owner Louisiana Pacific has now logged over 80% of the basin since 1985, and instead of protecting Little River as a refugia, timber harvest plans continue to be filed. Recently

The inability of the Simpson Aquatic HCP to craft a plan suitable for salmonid recovery is that the company will not allow for watershed rest. Kauffmann et al. (1998) point out that: "The first and most critical step in ecological restoration is passive restoration, the cessation of those anthropogenic activities that are causing degradation or preventing recovery." The high levels of watershed disturbance described above indicate a widespread need for Simpson owned watersheds to rest in order to allow true hydrologic recovery and return to channel diversity.

Freshwater Creek had almost fully recovered its function as prime coho habitat after 50 years of watershed rest following logging in the 1930s and 1940s (Higgins, 2001). Original logging in Freshwater, however, used trains and cable yarding and did not have a high density of roads. Recovery of logging from 30 to 50 years ago may be progressing more slowly because of chronic road failures on abandoned road networks. Watersheds will not heal and channels will not recover, if these legacy problems are not addressed.

C4-23 **Monitoring:** Simpson has collected data since at least 1994 in preparation of the HCP yet these data are not available to the public, to NMFS or other agencies. The NMFS should reject the Aquatic HCP and Draft EIS and make Simpson share all data in raw as well as summarized or analyzed form before the next draft is released.

Green Diamond's studies and monitoring are included in Appendix C. Such information includes water temperature, instream channel and aquatic habitat conditions, instream and recruitment zone LWD, sediment inputs from Class III watercourses, salmonid abundance in key watersheds, and headwater amphibian distribution, relative abundance and habitat associates. Raw data was not included in the Plan because inclusion of the volumes and volumes of information was not feasible. The Services believe that the data submitted provides an adequate basis for approving the Plan.

The total maximum daily load (TMDL) process is addressed in AHCP/CCAA Section 4.3.6. The north coast water bodies (identified in Table 4-3 of the Plan) were listed by the State Water Resources Control Board in 1998 and approved by the United States Environmental Protection Agency (USEPA) on May 12, 1999 as water quality limited relating in part to silvicultural and rangeland activities. These water quality conditions were considered as part of the existing baseline. See Master Response 1 regarding baseline conditions. The comment also suggests that NMFS should require Green Diamond to fund operation of the downstream out-migrant trap every year for the term of the Plan and permits. As discussed in Master Response 8(see also AHCP/CCAA Section 1.4.1 and EIS Section 1.5.1.1), the Services judge whether the Plan as proposed meets the ESA approval criteria. The Services have concluded that the Plan meets these criteria without requiring additional measures.

Response to Comment C4-24

California Timberland Owners operate under the CFPRs, (Title 14 CCR, Chapters 4, 4.5, and 10) and the Z'berg-Nejedly Forest Practice Act. Title 14 CCR 913.11, (Maximum Sustained Production of High Quality Timber) states that MSP can be achieved by meeting the requirements of either (a) or (b) or (c) in THP, SYP or NTMP, or as otherwise provided in Article 6.8, Subchapter 7. Green Diamond chose to meet the goal of MSP by developing a MSP plan under 'Option A' of this section. The MSP plan was submitted to CDF, Reviewed, revised, and approved. Timber operations on the majority of the area included in the Plan operate within the limits of the approves MSP plan.

Fuel loading and the subsequent potential risk of wildland fires were not addressed with specific conservation measures. However, Green Diamond activities related to large wildland fires were addressed under changed circumstances (AHCP/CCAA Section 6.2.9.1).

The Aquatic HCP and Draft EIS do not provide sufficient data to characterize present stream habitat and fish populations; consequently, the documents do not provide a basis for judging success over time. A sufficient monitoring program should use easily understood tools, that can be cost-effectively applied, and that can be compared to regional results. Such tools are V* (Hilton and Lisle, 1992; Knopp, 1993), bulk gravel samples or gravel permeability (McBain and Trush, 2000; PALCO HCP, 1998), cross sections and longitudinal profiles (Madej, 1999) and turbidity. Such data would allow the HCP to potentially come into compliance with TMDL (U.S. EPA, 1999). Instead the Aquatic HCP and the Draft EIS do not deal substantively with the TMDL process.

There had been far too little fisheries data collected and shared on Simpson Timber owned streams, although downstream migrant traps have been operated on occasion and electrofishing and spawner surveys conducted periodically. What is needed is consistently collected fisheries data that the company is bound to collect and share. Index electrofishing stations with block nets carried out over many years can have some utility. NMFS should require that Simpson fund operation of the downstream migrant trap every year under the life of the HCP.

The need to share data in raw form for independent analysis extends to water temperature data. The Aquatic HCP and Draft EIS used color codes for temperature ratings instead of references to locally based literature. Welsh et al. (2001) found that coho salmon in the Mattole River were only present when the floating weekly average water temperature remained under 16.8 C and floating weekly maximum under 18.3 C. This is consistent with findings of Hines and Ambrose (in review), who noted similar water temperature tolerance and patterns of distribution for coho juveniles in the South Fork Eel, Ten Mile, Big, and Noyo rivers. Essig (1999) pointed out that it is most effective to use temperature tolerance for one species in a program to monitor and abate water quality problems. Coho salmon are the keystone aquatic species for all northern California coastal streams, including those managed by Simpson Timber. Consequently, all data analysis related to ESA compliance or compliance with the Clean Water Act and meeting "beneficial uses" should reference known tolerances for coho. Stream temperature monitoring should also be required of receiving waters, larger downstream tributaries, such as the mainstem Klamath River. Consideration of acceptable tributary impacts must consider the status and needs of impaired water bodies downstream. C4-23

C4-24 **Forest Health**: In serving for over six years on the Klamath Provincial Advisory Committee, I have become a student of forest health, and Simpson manages some very unhealthy forests. Unfortunately, under the Aquatic HCP forest health conditions are likely to deteriorate. My experience within the Klamath Basin leads me to believe that fire risk is elevated on managed lands. Figure 20 shows Simpson property on the North Fork Mad River where herbicides have been applied. The major amount of dead material represents immense fuel loading and, along with even aged conifer forest, present an elevated risk of fire.

Clear cutting has disrupted the natural succession mechanisms for much Simpson's coniferous forests and many sites often come back in Ceonothus, hardwoods and invasive species. Simpson's attempts to restore conifers by repeated clear cut and spraying with herbicides have been futile (Figure 21). Thinning from below would be a compatible solution to both forest health concerns and improving watershed health. Instead the Aquatic HCP perpetuates a cycle least-cost forest management, using chemicals to promote growth as opposed to more labor intensive methods that would yield larger diameter trees and substantial returns in the future.

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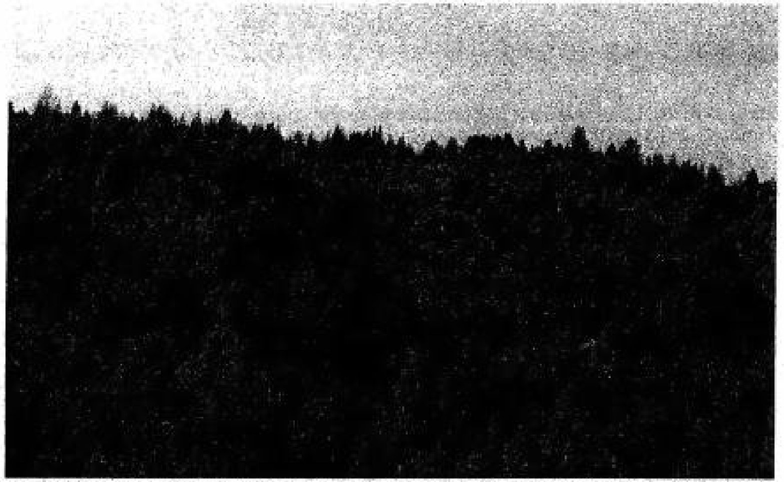

Figure 20. While the conifers in this photo look vigorous, the dead plants around them are hardwoods and successional species such as Ceonothus. This dead plant material represent fuels and increased fire risk. The spraying of herbicides on aquatic biota are unknown.

C4-24

Figure 21. Recent regeneration clear-cut just off Highway 299 in Redwood Creek growing more Ceonothus and hardwood species. This management style is a failed paradigm.