

4(d) RULE EVALUATION AND RECOMMENDED DETERMINATION

FMEP SUBMITTED BY: Oregon Department of Fish and Wildlife

FISHERIES OR AREA: Tributary fisheries potentially affecting listed Lower Columbia River steelhead (*Oncorhynchus mykiss*) in the Hood River basin.

EVOLUTIONARILY SIGNIFICANT UNIT (ESU): Lower Columbia River steelhead (*Oncorhynchus mykiss*)

4(d) RULE LIMIT: Limit 4

TRACKING NUMBER: NWR/4d/04/2001/006

DATE:

The Oregon Department of Fish and Wildlife (ODFW) has submitted a Fisheries Management and Evaluation Plan (FMEP) for Oregon recreational freshwater fisheries that may affect listed steelhead in the Lower Columbia River (LCR) basin (ODFW 2000). This plan was submitted for NOAA’s National Marine Fisheries Service (NOAA Fisheries) approval under limit 4 of the anadromous fish 4(d) Rule (50 CFR 223.203(b)(4); July 10, 2000; 65 FR 42422).

EVALUATION

The LCR steelhead ESU is listed as threatened under the Endangered Species Act (ESA). The 4(d) Rule for the LCR steelhead ESU states that the prohibitions of paragraph (a) of the rule do not apply to fishery harvest activities provided that:

- Fisheries are managed in accordance with a NOAA Fisheries approved FMEP, and
- Fisheries are implemented in accordance with a letter of concurrence from NOAA Fisheries.

NOAA Fisheries can approve an FMEP if it adequately addresses the specific criteria specified below. The following is an evaluation of whether the submitted FMEP adequately addresses the criteria for limit 4 of the 4(d) Rule for LCR steelhead.

Limit 4 Criteria and FMEP Evaluation

Clearly defines its intended scope and area of impact

This FMEP addresses impacts from inland recreational fisheries that affect or could potentially affect juvenile and adult LCR steelhead in the Hood River watershed in Oregon (all other fisheries impacting LCR steelhead in Oregon are included in a separate FMEP submitted by ODFW (ODFW 2001a). Table 1 summarizes the fisheries typically conducted in the action area, and indicates the method of consideration under the ESA. The FMEP excludes those mainstem Columbia River fisheries managed under *U.S. v. Oregon* and ocean fisheries that may encounter this ESU. The mainstem Columbia River fisheries undergo section 7 consultation initiated by the parties to *U.S. v. Oregon*, and the ocean fisheries undergo section 7 consultation initiated by the Pacific Fisheries Management Council. Tributary fisheries on the Washington side of the Lower Columbia River ESU are managed under the sole authority of the state of Washington. Washington Department of Fish and Wildlife has also submitted an FMEP for approval by NOAA Fisheries (WDFW 2003).

To briefly summarize, the fisheries are managed to prohibit the retention of all unmarked, adult steelhead. Only steelhead that are adipose fin-clipped may be retained by anglers. Adult steelhead are most likely to be captured by anglers targeting hatchery produced winter and summer steelhead or spring chinook salmon. Juvenile steelhead are most likely to be captured by anglers while fishing for resident trout during the summer.

Table 1. Fisheries in the Hood River subbasin that may impact Lower Columbia River steelhead

Fishery	Area	Harvest method	Typical dates open	Effect on Lower Columbia River steelhead
Chinook salmon	Hood River below Powerdale Dam	Angling only	August 1 - December 31	B
Coho salmon	Hood River below Powerdale Dam	Angling only	All Year	B
Winter steelhead (hatchery)	Hood River below Powerdale Dam	Angling only	February - May	A
Summer steelhead (hatchery)	Hood River below Powerdale Dam	Angling only	March - September	A
Trout	Hood River above and below Powerdale Dam	Angling only	Late May - Late Oct.	C

A = steelhead target fishery, B = potential for incidental encounter of steelhead adults, C = potential for incidental encounter of steelhead juveniles, D = steelhead not encountered.

Sets forth the management objectives and the performance indicators for the plan

This LCR steelhead FMEP specifies the management objectives as to provide a consumptive sport fishery on hatchery steelhead and non-listed salmon and a catch-and-release fishery for resident trout in the Hood River consistent with recovery of the ESA listed steelhead. The overall management intent is to implement permanent angling regulations in all streams within the Hood River subbasin that require the release of all unmarked steelhead. Only adipose-clipped adult steelhead may be retained in the fisheries.

The performance indicators for the management objectives of the Hood River steelhead FMEP are fully described in sections 1.1.1 and 3.1. Included are indicators addressing population parameters and measures of fishery performance. The population abundance indicator is a minimum average annual escapement of 100 naturally produced adult summer steelhead, and 200 naturally produced adult winter steelhead as measured at the Powerdale Dam trap. The interim long-term goal for the Hood River Production Program (HRPP) is to rebuild the self-sustaining run of Hood River summer steelhead to an annual run of 1,200 naturally produced fish and to rebuild the run of Hood River winter steelhead to an annual run of 1,200 naturally produced fish (BPA 1996). These escapement goals may be modified as part of the ongoing review of the HRPP.

Performance indicators also include fishery indicators for monitoring fishery performance and regulating impacts within prescribed limits. The primary fishery indicators for Hood River steelhead sport fisheries include harvest and catch estimates based on angler effort, harvest, and catch data collected in the lower 4.5 miles of the Hood River as part of a statistical harvest program. Data are collected on landings of natural and hatchery produced steelhead by sport anglers. Harvest sharing agreements, yet to be formalized between ODFW and the Confederated Tribes of Warm Spring Reservation of Oregon (CWSTRO), will identify the specific allocation of hatchery returns and the location of Tribal and non-Tribal fisheries in the Hood River.

In addition, NOAA Fisheries evaluates whether the FMEP adequately addresses the following criteria:

4(i)(A) Defines populations within affected ESUs, taking into account: spatial and temporal distribution, genetic and phenotypic diversity, and other appropriate identifiably unique biological and life history traits.

The FMEP identifies two potential populations in the Hood River subbasin: naturally produced summer steelhead and naturally produced winter steelhead. The Willamette/Lower Columbia River Technical Recovery Team (TRT) has identified two historical steelhead populations in the Hood River Basin representing summer and winter steelhead (Myers *et al.* 2002). ODFW operates two hatchery programs that are designed to supplement the natural spawning

populations of summer and winter steelhead (O'Tool and ODFW 1991). The artificial propagation programs for each of these populations uses adults collected at the Powerdale Dam trap. Further information on the population structure throughout the LCR ESU can be found in section 1.3.2 "Description of current status of each population relative to its Viable Salmonid Populations thresholds."

The extent to which naturally produced adult steelhead from MCR steelhead populations (i.e. Deschutes and John Day Rivers) or listed Snake River summer steelhead stray into the Hood River is unknown. However, unmarked hatchery summer steelhead from the Snake River ESU are known to commingle with Hood River stocks in the lower 4.5 miles of the Hood River. Stray hatchery summer steelhead from other subbasins are quite uncommon, though, totaling less than 2% of the steelhead captured at the Powerdale Dam trap. Hatchery winter steelhead from other programs are known to commingle with Hood River stocks in the lower 4.5 miles of the Hood River and may total up to 5% of the hatchery winter steelhead captured at the Powerdale Dam trap. None of these hatchery steelhead have been listed or considered essential for recovery.

The extent to which naturally produced steelhead from outside the Hood River subbasin will be intercepted in the sport fisheries within the Hood River is unknown, but impacts on these populations are expected to be negligible. All of the other listed ESUs in the Columbia River basin are either not affected by the fisheries included in the FMEP or the impacts are addressed in other FMEPs. Impacts on listed Hood River steelhead in mainstem commercial, sport and tribal fisheries are covered under *U.S. v. Oregon* consultations or section 10 permits.

4(i)(B) Uses the concepts of "viable" and "critical" salmonid population thresholds, consistent with Viable Salmonid Populations (VSP) concepts in "Viable Salmonid Population."

The regulations in the 4(d) Rule state that an FMEP must use the concepts of "viable" and "critical" thresholds (see McElhany *et al.* 2000) in a manner such that fishery management actions: (a) recognize significant differences in risk associated with viable and critical population threshold states; and (b) respond accordingly to minimize long-term risks to population persistence. Harvest actions that affect populations at or above viable threshold must maintain the population or management unit at or above the viable level. Impacts on populations above critical levels but not at viable levels (demonstrated with high degree of confidence) must not appreciably slow achievement of viable function. Impacts on populations functioning at or below critical threshold must not appreciably increase genetic and demographic risks facing the population and must be designed to permit achievement of viable functions, unless the FMEP demonstrates the likelihood of survival and recovery of the entire ESU in the wild would not be appreciably reduced by greater risks to an individual population.

The harvest regime specified in this FMEP will require all unmarked steelhead to be released unharmed. Only hatchery fish can be retained. Because of this selective harvest regime, impacts on listed fish will depend on the encounter rate of naturally produced fish in the fisheries, the associated catch and release mortality, and illegal harvest. Annual fisheries impacts are expected to be less than 1.8% of the naturally produced steelhead returning to the Hood River basin based on the assumed post-release mortality rate of 5% and a maximum fishery interception rate for the naturally produced population of 35%. This includes the additional fisheries mortality from angler non-compliance (illegal harvest) which is expected to be very low due to the greater than 90% angler compliance to fisheries regulations.

Since no change in fisheries management will occur if the listed populations rebound to healthy abundance levels (i.e. selective fisheries for hatchery fish only continue), viable threshold levels were purposefully not specified in the FMEP. This was deemed appropriate because of the low level of impacts on listed steelhead. Impacts on winter steelhead will never increase substantially under the selective fishing regime because of the low catch rates observed in other LCR steelhead fisheries. Fisheries impacts will not be increased beyond the incidental mortality levels associated with catch-and-release fishing at any population status that is above the critical level thresholds. Impacts will likely range for 0% to 2.5% at any abundance level.

NOAA Fisheries' "Viable Salmonid Populations and the Recover of ESUs" document (McElhany *et al.* 2000) describes four key parameters for evaluating the status of salmonid populations. These parameters are population size (abundance), population growth rate (productivity), spatial structure, and diversity. The Hood River steelhead FMEP describes the preliminary critical thresholds for the Hood River summer and winter steelhead populations. The estimates should be considered to be preliminary because biological information is limited. The thresholds may be revised in the future based on further information and recovery planning efforts by the TRT. The information produced by the TRTs will be incorporated into the into the comprehensive review process for this FMEP. This approach is consistent with the guidelines provided in the VSP technical document (see page 30 of McElhany *et al.* 2000). Below is an evaluation of whether the FMEP adequately addresses the VSP parameters for Lower Columbia River steelhead.

Population Size

Estimates of both summer and winter steelhead escaping upstream from Powerdale Dam exist annually since 1992. The estimated escapement of naturally produced summer steelhead past Powerdale Dam ranges from 65 to 477 and averages 195 adults. The estimated escapement of naturally produced winter steelhead past Powerdale Dam ranges from 194 to 678 and averages 336 adults. To develop the critical threshold for the Hood River summer steelhead, ODFW compared the Hood River populations to populations in other subbasins where longer data series are available to develop stock recruitment curves and conduct population viability analysis (see Chilcote 2001 and Section 1.3.1). ODFW developed interim critical thresholds of 100 naturally produced summer steelhead adults and 200 naturally produced winter steelhead adults past

Powerdale Dam. The critical thresholds for the summer and winter steelhead populations were set to represent 20% of the maximum seeding spawner estimates for the other populations used to develop the critical thresholds for the Hood River populations. The interim critical levels are currently under going revisions and will be updated through information gathered by the HRPP monitoring and evaluation activities. Given the guidelines established for critical population size in McElhany *et al.* (2000), and the modeling efforts by ODFW (Chilcote 2001), the preliminary critical thresholds appear to be reasonable.

As previously stated, viable abundance thresholds were purposefully not identified because selective fishing will continue indefinitely into the future. Fishery impacts will be from catch-and-release mortality and, in the case of the Hood River, will likely not change substantially at any population status in the foreseeable future.

Population Growth Rate

The viable thresholds for productivity are defined as: in the short-term, a generally increasing trend in escapement; and for the long-term, an average replacement rate equal to one. If the populations meet these thresholds, the populations would not be declining over the long term.

Since the fishery mortalities specified in the FMEP are so low (in the range of 0% to 1.8%), the fisheries will not likely affect the productivity, to any extent measurable, of either population in the Hood River. At these low impact levels, it is not possible to separate the effect the fisheries may have on the long-term productivity from naturally produced variability in productivity.

Productivity may also benefit from the removal of hatchery summer and winter steelhead from the natural spawning population. Currently hatchery fish escapement into the Hood River basin is managed by ODFW at a trap at Powerdale Dam (Rm 4.5). Broodstock is collected at this site for the two hatchery programs and the proportion of hatchery fish released into the basin to spawn naturally is monitored. Detailed progeny studies are ongoing in the basin to determine the success of hatchery steelhead that spawn naturally. The control of hatchery steelhead through harvest may become more important after the removal of Powerdale Dam which is expected to occur in 2011. The ODFW proposals in the FMEP are not expected to contribute to the reduction or retard the population growth rate of the Hood River steelhead populations.

Spatial Structure

It may be possible for fisheries to affect the spatial structure of a population and/or ESU. For example, a fishery could target a certain portion of the run, which may result in a substantial decrease in the number of spawners destined to a particular spawning location or population. The early portion of a run of steelhead may be the fish that migrate the farthest upstream. If the fishery harvests the early returns, the spawning distribution of a population may change. Therefore, a fishery designed to protect the long-term integrity of naturally produced populations should be managed to explicitly avoid or minimize such disproportional effects.

Based on NOAA Fisheries' assessment of the potential impacts from the fisheries on the spatial structure, the selective fishing regime in the Hood River steelhead FMEP is expected to reduce any potential adverse effects on the spatial structure of the LCR winter steelhead populations. The fishery allows for the retention of only marked hatchery steelhead and is expected to handle less than 35% of the returning naturally produced adults over the entire run, this should not cause the fishery to be selective for distinct proportions of the run. As a result, the selective fishing regime in the Hood River FMEP is not expected to affect the spatial structure of the Hood River summer and winter steelhead populations.

The spatial structure of populations within the ESU are generally a function of habitat size and distribution. The proposed fisheries should not affect habitat, and the low fishery impacts should not reduce populations to levels where spatial effects are exacerbated. The loss of historic habitat from degradation has contributed to the loss of the spatial integrity of steelhead populations in the ESU more than any other factor. In the Hood River, the interim long term goal is an escapement of 1,200 spawners for each of the steelhead populations. These estimates are being re-evaluated as part of the HRPP. This interim level is well below an earlier estimate developed during the beginning of the Hood River subbasin plan which identified goals of 8,000 naturally produced summer steelhead and 5,000 naturally produced winter steelhead (O'Tool and ODFW 1991).

Diversity

Actions described in the FMEP are not likely to affect within- and among-population diversity of the ESU. As stated above in the Spatial Structure assessment, the fisheries will not likely impact a specific portion of the run to a greater extent than another portion. Diversity parameters are most likely influenced by habitat and the effects of natural spawning by hatchery steelhead. Marked hatchery steelhead that are caught in the proposed fisheries can be retained, and this can minimize the potential effects of hatchery steelhead on the diversity of the naturally produced population. The small, proposed fishery impacts are not expected to affect the diversity of the population by selecting for specific characteristics.

4(i)© Sets escapement objectives or maximum exploitation rates for each management unit or population based on its status, and assures that those rates or objectives are not exceeded.

The fishery management strategy in the FMEP is to conduct consumptive fisheries for adipose fin-clipped adult hatchery steelhead and salmon and catch-and-release fisheries for rainbow trout. The interim escapement goal for summer steelhead is 100 and for winter steelhead is 200 as measured at Powerdale Dam. These are minimums with a goal of maximizing the escapement of naturally produced steelhead. Final escapement goals for each population will be developed as more data is collected through the HRPP.

The overall mortality rate for catch-and-release fisheries depends on the encounter rate of naturally produced fish (percentage of run actually caught and released) in the fisheries, the mortality rate associated with being caught and released (hook-and-release mortality), and the illegal harvest of naturally produced fish. Based on the best available information, fishing mortality rates for summer and winter steelhead in the Hood River are expected to be 1.8% (section 1.4.1 of the FMEP). This estimate was derived from a 35% encounter rate (average for both populations) and a 5% catch-and-release mortality rate (Hooton 1987).

ODFW performed a number of PVA model runs for 27 steelhead populations to assess the impact of fisheries mortality on the status and recovery of steelhead in Oregon. The model looked at a range fisheries mortalities from 0% to 75%. The results were stated in terms of the probability of the population becoming extinct in 50 years at each mortality rate. For most populations the modeling suggested that the probability of extinction was essentially zero as long as fisheries mortality rates remained less than 30%. As mortality rates became greater than 40% the probability of extinction increased dramatically. Furthermore, once the probability of extinction increased beyond 0.05, the transition to an extinction probability of 1.00 was very rapid. In other words, once mortality rates increase sufficiently to cause the probability of extinction to exceed 0.05, any additional mortality would cause a rapid increase in the likelihood of extinction. Because the transition from low to high risk happens so rapidly, there is little room for error (in the model or the measurements of mortality rates). To address this concern, ODFW has set the maximum fisheries mortality limit to 20%. This conservative approach was used to provide a buffer for errors, even though the model results suggested that management under a 40% limit was unlikely to cause extinction.

Based on estimated encounter rates, hook and release mortalities, impacts on juvenile steelhead, and the projected level of illegal harvest, total fisheries impacts are expected to be less than 1.8% of the naturally produced summer and winter steelhead in the Hood River. The steelhead fishery will continue as proposed as long as the average naturally produced spawning summer and winter steelhead escapements are above 100 and 200 adults at Powerdale Dam, respectively. The trend in naturally produced steelhead escapement will be monitored annually. If there is a downward trend or an indication that escapement levels will fall below objectives in the foreseeable future, then additional fishery restrictions will be imposed. These restrictions can include reducing the bag limit, restricting area and season openings, or even the complete closure of the river to steelhead harvest.

4(i)(D) Displays a biologically based rationale demonstrating that the harvest management strategy will not appreciably reduce the likelihood of survival and recovery of the ESU in the wild, over the entire period of time the proposed harvest management strategy affects the population, including effects reasonably certain to occur after the proposed actions cease.

The complete analysis of the biological impacts from the fishing regime is fully described in section 2 “Effects on ESA-listed Salmonids” of the FMEP (ODFW 2000). Below is a summary of NOAA Fisheries’ evaluation of the fishery impacts on juvenile and adult summer and winter steelhead.

Adult Summer and Winter Steelhead

ODFW has implemented restrictive regulations that require the release of naturally produced adult steelhead. Furthermore, to reduce impacts on juvenile steelhead, ODFW has implemented restrictive regulations including reduced bag limits, area closures, gear restrictions, timing restrictions, and size restrictions for trout fisheries.

Estimates of steelhead harvest by sports anglers from the mouth upstream to Powerdale Dam are available for both summer and winter steelhead for run years 1996-97 to 1998-99. Estimates of the number of steelhead returning to the mouth of the Hood River are also available for those years. Using these data, an average catch rate of 35% can be established for all groups of steelhead caught in Hood River fisheries. Applying the 5% hook and release mortality rate and the interception rate an estimated 1.8% of the average annual return are lost to hook and release mortality. Additional fisheries mortality from angler non-compliance (illegal harvest) is expected to be very low due to the greater than 90% angler compliance to fisheries regulations.

The 5% catch-and-release mortality rate is conservative for steelhead based on the average mortality estimate for steelhead of 3.4% developed by Hooton (1987). Catch-and-release mortalities tend to increase as water temperatures increase with over 80% of the observed mortalities in one study occurring above 21 degrees C (Taylor and Barnhart 1997). However, water temperatures greater than 20 degrees C were not measured in the lower reaches of the Hood River in water years 1995 and 1996 and most sites were several degrees C colder. The estimated catch-and-release mortality rate for naturally produced summer steelhead should, therefore, not be greater than the 5% estimate.

Past harvest impacts on adult steelhead in the Hood River prior to the start of mandatory unmarked fish release regulations in 1991 are unknown. Cramer *et al.* (1997) reviewed harvest rates of adult steelhead in sport fisheries in Oregon and Washington prior to naturally produced (unmarked) steelhead release regulations, who concluded that harvest rates on naturally produced summer steelhead were in the neighborhood of 50%. Harvest rates in the Hood River could have been of this magnitude during some years. Analysis of escapements and harvest of steelhead in the Hood River below Powerdale Dam, when mandatory release regulations were in effect, estimated that less than 1.8% of the returning naturally produced steelhead would be lost to the steelhead fishery annually, plus a small number due to non-compliance. NOAA Fisheries expects that the annual harvest impacts under the FMEP will remain at these levels, which is well below the 50% that was observed in the past.

Fisheries for salmon are also proposed in this FMEP. In the past it was legal to retain fall chinook and coho salmon from August 1st to December 31st. Very few fall chinook and coho return to the Hood River and little or no target sport fishery exists for these species. In 2001, a strong return of hatchery spring chinook to the Hood River provided the opportunity of a spring chinook fishery allowing for the retention of marked hatchery spring chinook returning to the HRPP facilities. This fishery was open from June 1st for marked spring chinook only in the areas from the mouth to Powerdale Dam. In 2001, a tribal harvest using hook and line methods targeting spring chinook also occurred at Punchbowl Falls in the West Fork Hood River. This was a traditional sight for tribal harvest. ODFW and the CTWSRO are currently developing escapement levels that would trigger a sport and tribal fishery in the Hood River for spring chinook. The fishery may also be open earlier than the June 1st opening observed in 2001. Gear restrictions in place and the requirement that all unmarked steelhead be released unharmed should minimize mortality to juvenile and adult naturally produced steelhead and impacts are expected to be low from these fisheries. The sport angling of listed LCR chinook salmon is addressed in a separate FMEP (ODFW 2001b).

Juvenile Summer and Winter Steelhead

Steelhead occupy many waters that are also occupied by resident trout species, and it is not possible to visually separate juvenile steelhead from similarly sized stream-resident rainbow trout. Because juvenile steelhead and resident rainbow trout are the same species, are similar in size, and have the same food habits and habitat preferences, it is reasonable to assume that catch-and-release mortality studies on stream-resident trout also apply to juvenile steelhead. Where angling for trout is permitted, catch-and-release fishing with prohibition of use of natural and synthetic bait will reduce juvenile steelhead mortality more than any other angling regulatory change. Many studies have shown trout mortality to be higher when using bait than when angling with artificial lures and flies (Talyor and White 1992; Schill and Scarpella 1995; Mongillo 1984; Wydoski 1977; Schisler and Bergersen 1996). Wydoski (1977) showed the average mortality of trout when using bait to be more than four times greater than the mortality associated with using artificial lures and flies. Taylor and White (1992) showed average mortality of trout to be 31.4% when using bait versus 4.9% and 3.8% for lures and flies, respectively. Schisler and Bergersen (1996) reported average mortality of trout caught on passively fished bait to be higher 32% than mortality from actively fish bait (21%). Mortality of fish caught on artificial flies was 3.9%. In some fisheries that occur during the general trout season, larger hooks may reduce the efficiency of hooking juvenile steelhead because it will be more difficult for juveniles to swallow the bait (Muoneke and Childress 1994). Most studies have found little difference (or inconclusive results) in the mortality associated with using barbed versus barbless hooks, single versus treble hooks and different hook sizes (Schill and Scarpella 1997; Taylor and White 1992; Mongillo 1984). However, some investigators believe that the use of barbless hooks reduces handling time and stress on hooked fish and adds to survival after release (Wydowski 1977). In summary, catch-and-release mortality of juvenile steelhead is expected to be less than 10% and approaches 0% when fishermen are restricted to use of artificial flies and lures with barbless hooks.

Past harvest impacts on juvenile steelhead from trout fisheries in the Hood River are unknown. Cramer *et al.* (1997) were of the opinion that the greatest sport harvest of steelhead in recent times may have been on juveniles taken in trout fisheries, rather than on adults. Angling mortality of juvenile steelhead in the Hood River was likely heightened as the result of legal trout stocking and the use of bait in much of the river prior to 1996 and 1999, respectively. Currently no trout are stocked in the Hood River subbasin. Other regulations that protect juvenile steelhead include opening the trout fishery from the fourth Saturday in May to October 31, which protects outmigrating smolts, and an eight inch minimum length to minimize angling pressure on steelhead subyearlings. Trout fishing in the Hood River subbasin is further restricted to allow only catch-and-release angling with artificial lures. These regulations are in place in 69.8% of the Hood River watershed, the remaining 30.2% of the watershed (the West Fork subbasin) is closed to all angling. All these management actions, the nature of the fishery, and the relatively low fishing effort anticipated, are expected to limit the catch and release of juvenile steelhead to less than 1% of the natural population annually.

The ODFW analyzed the effects of fishery impacts greater than those proposed for the LCR steelhead management area. They found that the probability of extinction for nearly all steelhead populations modeled throughout Oregon was zero when total annual harvest rates were restricted to 20% or less (Chilcote 2001). The probability of extinction was defined in the model, as the number of times in a 1000 model runs that the population reached zero in last six years of a 50 year period, at various harvest rates. The model showed that once harvest impacts increase above 20%, the probability of extinction increases substantially for all the populations. NOAA Fisheries believes that the Hood River would show a similar trend. The total expected fisheries mortality on naturally produced Hood River steelhead (Columbia River mainstem commercial, mainstem sport, and tributary sport fisheries) is expected to be less than 10% of the naturally produced summer and winter steelhead annually. Because the proposed impact levels from in and out-of-basin fisheries are substantially lower than the modeled levels at which extinction risks increase, impacts will not appreciably reduce the likelihood for survival and recovery of steelhead populations in the Hood River subbasin.

Furthermore, this level is not expected to appreciably reduce the likelihood of survival and recovery of listed steelhead based on the information about the population presented in the FMEP. Specifically, the number of naturally produced summer steelhead returning to the Hood River has remained greater than the interim critical threshold for the period of record except for the 1997-98 run-year and has shown an increasing trend in the last few years. The naturally produced winter steelhead returning to the Hood River has remained greater than the interim critical threshold for the period of record except for the 1994-95 run-year and has shown an increasing trend in the last few years. The implementation of the restrictive fishery actions proposed in this plan are not expected to appreciably reduce the likelihood of survival and recovery of the Hood River steelhead populations.

4(i)(E) Includes effective (a) monitoring and (b) evaluation programs to assess compliance, effectiveness, and parameter validation.

The trap at Powerdale Dam allows for total counts of all upstream migrating fishes and will be a key component in meeting and measuring not only the objectives of the FMEP but the goals and objectives of the HRPP. As part monitoring and evaluation of the HRPP, statistical creel surveys are conducted to collect data on angler effort, encounter rate, and harvest in the lower 4.5 miles of the Hood River. The harvest of Hood River steelhead in the mainstem Columbia River is monitored by the parties to the *U.S. v. Oregon* process. Harvest sharing agreements have not been formalized between ODFW and CTWSRO, but when tribal harvest occurs, statistical harvest surveys will be initiated to estimate the catch of steelhead. Section 3 (Monitoring and Evaluation) of the FMEP provides a more detailed explanation of the monitoring programs throughout the subbasin.

Monitoring of the performance indicators listed in Section 1.1 will be refined with the collection of additional data under the HRPP. Given the nature of the data collected, long time series may not be needed. The HRPP monitoring and evaluation collects robust information for steelhead escapements to the Hood River including a full counting of adults passing at Powerdale Dam, age data for brood year assignment, harvest estimates in the lower river needed to estimate smolt to adult survival, and estimates of outmigrating juvenile steelhead made for the tributaries and mainstem Hood River (see section 3.2). In addition to the monitoring programs discussed in the FMEP, there are numerous other ongoing projects funded by other agencies or programs which provide additional information useful for fisheries management of LCR steelhead.

ODFW and the CTWSRO are developing plans for monitoring and evaluating the performance indicators through the HRPP particularly focusing on activities after the removal of Powerdale Dam. The removal will eliminate one method of enumerating adults enter the Hood River basin and HRPP members are looking at other methods that will allow monitoring of the performance indicators in this FMEP.

4(i)(F) Provides for (a) evaluating monitoring data; and (b) making any revisions of assumptions, management strategies, or objectives that data show are needed will be made.

As explained in sections 3.5.1 and 3.5.2 of the FMEP, ODFW will evaluate monitoring data on an annual basis. These reports will include biological and fishery information from the previous year and an assessment of how the fisheries performed with respect to the objectives and guidelines established in the FMEP. In addition, a comprehensive review of the FMEP is scheduled to occur every 5 years to evaluate whether the fisheries and naturally produced steelhead populations are performing as expected. Comprehensive reviews will be repeated at 5 year intervals thereafter until such time as the steelhead stocks are recovered and delisted. The comprehensive review will allow management assumptions to be further verified and allow new

information or findings to be incorporated into the FMEP. This includes the determinations from formal recovery planning efforts by the Technical Recovery Teams.

4(i)(G) Provides for (a) effective enforcement, (b) education, ©) coordination among involved jurisdictions.

The enforcement program is described in section 3.4 of the FMEP. The Fish and Wildlife Division of the Oregon State Police (OSP) is responsible for enforcement of fish and wildlife regulations in the State of Oregon. The Dalles Patrol Office of the OSP houses six troopers and a sergeant that have either primary or secondary responsibility to patrol the Hood River subbasin. Enforcement priorities for the subbasin are developed through the Coordinated Enforcement Program. This program is designed to coordinate effective enforcement by developing enforcement priorities and plans between OSP officers and ODFW biologists. At the meetings OSP officers share the previous year's results (i.e., compliance rates and compliance problems) with ODFW biologist to assist in improving effectiveness and to assist in the development of new angling regulations. All angling regulations developed by ODFW biologists are reviewed by OSP fish and wildlife officers to insure that the regulations are enforceable and can be done so effectively and efficiently. One product of the Coordinated Enforcement Program process is the formulation of specific action plans to deal with identified enforcement concerns. A formal action plan to protect steelhead smolts in the Hood River has been in place for several years.

Protection of adult naturally produced steelhead are assigned a high priority for compliance enforcement. Smolt protection is also a high priority during their migration from spawning beds to the ocean. Troopers conduct bank and boat patrols to check and assist anglers. ODFW personnel check anglers during creel, carcass and spawning ground surveys. Observations by OSP indicate angler compliance with fisheries regulations is high, in excess of 90%.

The FMEP describes measures that will be taken to inform and educate the public about the fisheries (section 3.3 of the FMEP). A list of fishing regulations are available through license vendors and on the ODFW website. Proposed regulation changes are publicized and subject to comment by the general public. ODFW also publishes "The Oregon Sport Fishing Regulations Pamphlet" and emergency notices for distribution by license vendors and ODFW regional offices. Signs are also placed at public access points along the Hood River. NOAA Fisheries will be contacted in the case of regulation changes.

Additional public outreach opportunities are also possible during interactions between anglers and harvest samplers. These interactions allow ODFW to explain to the anglers fishery management objectives and their importance in the subbasin. Harvest samplers are trained to respond correctly to questions relative to fishery regulations, the purpose and intent of these regulations, and ways that the individual angler can help meet management objectives. A variety of handouts covering specific management objectives and intent for Hood River summer and

winter steelhead have been produced by Field Office personnel and are provided to the public. Many steelhead tagged at the Powerdale Dam trap are recovered by anglers each year. A large number of these tags are sent to the Dalles Field Office, many with requests for information on the tagging program. This has proven to be an excellent opportunity to inform and educate anglers on the management objectives for steelhead on the Hood River. The Dalles Field Office, which is located near lower Hood River, also receives inquiries about steelhead management in the Hood River allowing office personnel to explain management objectives.

4(i)(H) Includes restrictions on resident and anadromous species fisheries that minimize any take of listed species, including time, size, gear, and area restrictions.

The fisheries within the Management Area specified in the FMEP (section 1.2.1) include many restrictions specifically designed to control impacts on adult and juvenile steelhead. Section 4(i)(D) above provides a detailed assessment of angling regulations and their effect on juvenile and adult steelhead. These regulations are currently in effect as Oregon state law and will remain in effect in the foreseeable future. In the future, if there are proposals to change existing angling regulations, ODFW, will first confer with NOAA Fisheries before adoption, as stated in the FMEP, and in section 223.203 (4)(iii) of the 4(d) Rule for LCR steelhead.

4(i)(I) Is consistent with other plans and conditions established within any Federal court proceeding with continuing jurisdiction over tribal harvest allocations.

The actions and objectives of this FMEP are subject to and consistent with the Columbia River Fish Management Plan (*U.S. v. Oregon*). The FMEP was developed in cooperation with the CTWSRO, and is consistent with applicable federal court proceedings.

(4)(ii) The state monitors the amount of take and provides NOAA Fisheries a report on a regular basis.

As described in section 3.5.1 of the FMEP, ODFW will assess compliance with the provisions in the FMEP annually. The escapement of summer and winter steelhead will be monitored every year with restrictions to fisheries made inseason if counts of naturally produced steelhead indicate additional conservation measures are necessary. An annual report summarizing their findings will be provided to NOAA Fisheries by March 31st of each year.

A comprehensive review of the FMEP will occur every five years. These reviews will evaluate whether the FMEP is accomplishing the stated objectives and revise management strategies if necessary. This review will be in cooperation with NOAA Fisheries.

(4)(iii) The state confers with NOAA Fisheries on its fishing regulation changes.

As stated in section 3.5.1 of the FMEP, ODFW will confer with NOAA Fisheries on any fishing regulation changes that may affect listed steelhead in the Hood River Basin. Information on the proposed regulation change will be provided at least 2 weeks in advance of the decision being made.

(4)(iv) Written concurrence of the FMEP.

If the concurrence is made that the FMEP adequately addresses all of the criteria specified in limit #4 of the 4(d) Rule, NOAA Fisheries will issue a letter of concurrence to ODFW, which will specify the necessary implementation and reporting requirements.

Processing of the Public Comments Received.

As required in (4)(iii) of section 223.203 of the 4(d) Rule for LCR steelhead, before a FMEP can be approved or amended, the public must have had an opportunity to review and comment on the FMEP. A Notice of Availability and Request for Comment on ODFW's Hood River FMEP was published on May 4, 2001 (66 FR 22532). NOAA Fisheries received no public comments.

RECOMMENDED DETERMINATION

As evaluated above, the Salmon Recovery Division recommends that the Regional Administrator determine that the FMEP for fisheries potentially affecting ESA-listed Hood River steelhead submitted by ODFW adequately addresses all of the criteria established for limit #4 of the 4(d) Rule. If the Regional Administrator so finds and approves the FMEP, the take prohibitions would not apply to fisheries implemented in accordance with the approved FMEP and NOAA Fisheries' letter of concurrence.

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