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APPENDIX G

Comments On Hellgate RAMP/DEIS's Appendix G

Fisheries Factors And Assumptions (pages 371 - 376)
February 9, 2001

Credit is given to the author(s) of Appendix G by NEPA Design Group (NDG) for making a serious attempt to develop a fisheries impact methodology (see NDG's Appendix D). The author was one of the few Hellgate RAMP/DEIS interdisciplinary team members that braved the frontier of attempting the scientific method in impact analysis. It is believed that a refinement of his effort in a supplemental DEIS will result in value to the decisionmaker and the public (i.e., a basis for understanding and judging the reliability of the impact analysis).

The following information fishery factors and assumptions (in **bold** and *italics*) were found in Appendix G of the Hellgate RAMP/DEIS. Each of the 10 factors and assumptions, including Table Appendix G-1 (pages 373 - 376) is followed by comments and recommendations. Our comments are based on the assumption that Appendix G is part of an impact methodology for determining significant impacts (or if not, should be) and our opportunity as defined in the BLM's NEPA Handbook (see Appendix A) to comment on the adequacy of the analysis and the significance determinations.

> "*Comments on the Adequacy of the Analysis. Comments which express a professional disagreement with the conclusions of the analysis or assert that the analysis is inadequate may or may not lead to changes in the EIS. Interpretations of analyses should be based on professional expertise."*
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> *"Comments Which Identify New Impacts, Alternatives, or Mitigation Measures. If public comments on a draft EIS identify impacts, alternatives, or mitigation measures which were not addressed in the draft, the manager responsible for preparing the EIS should determine if they warrant further consideration. If they do, that official must determine whether the new impacts, new alternatives, or new mitigation measures should be analyzed in either; the final EIS; a supplement to the draft EIS; or a completely revised and recirculated draft EIS."*
>
> "*Disagreements With Significance Determinations.. Comments may directly or indirectly question determinations regarding the significance or severity of impacts. A reevaluation of these determinations may be warranted and may lead to changes in the EIS..*"

1. ***Fall chinook redds are found in riffles in the main channel where boating activity occurs.***

1. Comments. Whitehorse Riffle, Matson Riffle, Panther Chutes, and Wharton Riffle are identified as the four major spawning areas on page 84 of the DEIS. Eisman Stillwater, Whitehorse Riffle, Finley Bend, Panther Chutes, and Warton Riffle are identified as the five major fall chinook spawning areas in the RAMP/DEIS (page 125). Whitehorse Riffle, Matson Riffle/Finley Bend, Panther Chutes, and Wharton Riffle are identified as the four major spawning areas on Map 3-1 of the DEIS (page 177). The name differences and the number differences are confusing. They are listed here as examples for applying the above factor/assumption.

Eisman Stillwater — It is agreed that fall chinook redds are probably found in the main channel at the very downstream end of Eisman Stillwater where, in places, boating activity can occur at shallow water depths, perhaps ranging from approximately 12 to 18 inches.

Whitehorse Riffle — It is not agreed that fall chinook redds are normally found in the main channel of Whitehorse Riffle as the main channel in this area changes frequently and fall chinook may or may not use the area for spawning on any given year.

Matson/Finley Bend — It is not known whether fall chinook redds occur in the main channel of Finley Bend as the water is deep (many feet) in this channel, and spawning chinook and redds, if they exist, can not be verified (i.e., visually verified).

Panther Chutes — It is not agreed that fall chinook redds occur in the main channel of Panther Chutes. Consistent annual observations have demonstrated that fall chinook spawning and redds occur in a shallow water area on left bank away from the main channel for boating traffic which is in the deeper part of the river near right bank. If redds occur in the main channel they are unseen many feet down in deep water.

Warton Riffle — It is agreed that boating activity in the main channel occurs in the upstream portion of the Warton Riffle spawning area where, in places, boating activity can occur at shallow water depths, perhaps ranging from approximately 12 to 18 inches.

Another consideration that we believe should have been considered was that egg mortality from boat turbulence was mitigated by water depth.

- The following is documented in the Alaska fish study.

> "*An unpublished study in Missouri compared wake height and substrate disturbance in a stream created by similar sized motors equipped with a jet unit or propeller unit (Bush 1988). Both boats caused significant disturbance in shallow water (18 -26 cm); neither caused a significant disturbance at depths of 44 cm. However, at water depths of 36 cm, physical disturbances from jet boats were less than those created by propeller boats. Further study of jet boat disturbance on substrate was recommended in water less than 18 cm deep where propeller-driven boats were not used.*"

It is recommended that any reference to the Missouri study provide the full assessment of impacts by water depth: 7 - 10 inches — significant disturbance, 14 inches — less disturbance by jet boats than those created by propeller boats, and over 17 inches — no significant disturbance. What was the size of the study stream compared to the main stem of the Rogue River? It appears that considerations in any impact methodology should consider substrate size, number of boat passes, size of boats, depth of water, depth of eggs in gravel, size of streams, and health of stock being potentially impacted.

- Some of the conclusions from the executive summary for the Alaska study follow.

  Pressure was not the mechanism responsible for embryo mortality due to passing jet boats. Mortality occurred when substrate was moved by the direct discharge from a jet unit. Embryos were killed either in the gravel by impact or as a result of being displaced from the gravel. Direct observations of substrate movement, as opposed to pressure wave measurement, would be more effective for evaluation of conditions under which a jet boat would cause significant embryo mortality.

  Gravel movement is restricted to an area immediately underneath the boat. Embryo mortality decreases with increasing water depth, increasing gravel depth, and increasing distance from the side of the boat. Although embryo mortality can be very high under certain conditions, such as in shallow water depths, the actual values or conditions will vary; numbers resulting from this study cannot be directly applied to other situations. Professional judgment will be necessary in applying these results to other situations. There is little or no effect on behavior of spawning sockeye salmon due to low jet boat traffic (occasional pass). There may be an effect if traffic is heavy or other salmonid species are involved.

  Embryos at stages 8-13, generally the most sensitive stages due to gastrulation, were most susceptible to jet boat effects when eggs remained in the gravel; mortality was 63 percent in treatment sections of American Creek compared to 0 in index areas. However, this effect was mitigated by water depth: treatment mortality was significant only at water depths of 13-23 cm and was non-significant at 23-31 cm. When eggs were displaced as a result of gravel movement, treatment mortality was as high as 100 percent.

- The recommendations from the executive summary for the Alaska study follow.

  Limiting jet boat activity may be warranted in small streams where the potential for substrate difference is high. However, the overall effect of jet boats on salmonid reproduction is not clear. Embryo mortality from jet boats would likely be considerably lower than that from natural causes, both density-independent (e.g. flood scouring) and density-dependent (e.g., redd superimposition). Jet boats would have a minimal impact on the recruitment of a healthy stock spawning over large reaches of a stream. However, stocks relying on restricted stream reaches for successful spawning could be vulnerable to jet boat impacts. In such instance, restrictions, such as zoning during specific periods, could be warranted. Such restrictions should be made on a case-by-case basis, avoiding blanket restrictions that fail to take site-specific conditions into account.

1. Recommendations. It is recommended that the BLM provide its documented inventory of fall chinook spawning for all the listed spawning areas (page 125 and Map 3-1 on page 177), including its method of inventory (e.g., season of year, number of seasons inventoried, actual viewing days on river, boat, air, or secondary references, depth of water, size of spawning area, etc.) in the appendix of a supplemental DEIS. This kind of information provides the public with a basis for understanding and judging the reliability of the impact analysis (see Appendix A and Appendix D).

It is recommended that any reference to the Alaska study provide the full assessment of impacts by water depth: treatment mortality was significant at water depths of 5 - 9 inches and non-significant at water depths of 9 - 12 inches. What was the size of the Alaska study stream(s) compared to the main stem of the Rogue River? Other major considerations in any impact methodology should consider substrate size, number of boat passes, size of boats, depth of water, depth of eggs in gravel, size of streams, and health of stock being potentially impacted.

It is recommended that the normal water depth of MTBs over spawning areas be described in the affected environment section of the Hellgate RAMP/DEIS (i.e, 1. when are the MTBs at 7-10 inches or less in the water and how much (area and percentage) of the spawning areas are impacted by MTBs at levels 7-10 inches or less and 2. when are the MTBs at depths more than 10 inches and how much (area and percentage) of the spawning areas have water depths of more than 10 inches and are not impacted by MTBs)?

2. ***Fall chinook salmon spawning, courtship display, redd building and fertilization are considered sensitive to disturbance from boats passing over these areas.***

2. Comments. The Alaska fish study and the BLM's juvenile fish study identified that disturbance to adult behavior during spawning can be caused by passing motor boats, slow moving rafts, people on shore, and specially people angling in the spawning areas; the DEIS identified essentially the same disturbances (see affected environment chapter of the Hellgate RAMP/DEIS, page 123).

Alaska Fish Study — *"Spawning sockeye were slow to respond to passes made with the jet boat used on American Creek. Only when the boat was a few feet away did any noticeable reaction occur. Fish scattered in several direction seemingly unsure of the source of disturbance. In most cases, individual fish returned to their original positions after a few seconds to a minute. By contrast, spawners reacted to the disturbance caused by a wading human at a relatively greater proximity. At times, a shadow alone was enough to cause a response. Individuals also tended to take longer, usually 3-5 minutes, to return to their original positions. Incidental observations of wading bears seemed to elicit a similar response. The direction of fish movement due to either wading people or bears was in all cases away from the disturbance."*

BLM's Juvenile Fish Study[1] — *"This effort focused on the effects of river use on juvenile fish. It concluded that all watercraft disturbed fish, however, slow moving watercraft and people wading in the river disturbed fish the most."* (page xiii of Hellgate RAMP/DEIS).

BLM's Juvenile Fish Study[1] — The following is the summary of the study in its entirety.

This project was designed to evaluate the effects of boat traffic on juvenile salmonids in the Hellgate Recreation Section of the Rogue River. For integrated objectives included work to determine the effects of boat traffic on salmonid (1) survival, (2) stress, (3) choice of habitat, and (4) susceptibility to predation. Sampling began in 1993 and ended in 1994.

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[1] State of Oregon, Department of Fish and Wildlife. 1995. *Effects of boat traffic on juvenile salmonids in the Rogue River*. Portland, OR.

Surveyors did not find any fish stranded along the shoreline after (1) passage of 12 private motorboats and 195 tour boats during the commercial season and (2) passes of 13 sites with a tour boat experimentally operated before the season of commercial operation. Surveyors found some stranded crayfish that died before they could return to the river. Dead crayfish appeared to be Orconectes neglectus, a species probably transplanted from the central region of the United States.

Survival of juvenile fall chinook salmon Oncorhynchus tshawytscha, as indexed by the annual spawning distribution of adults, was not related to annual levels of tour-boat trips, as indexed by the number of passengers carried. The proportion of adult salmon that spawned in the area of tour-boat operations increased in 1988-93 despite significant increases in the size and number of tour boats that operated during 1985-90.

Concentrations of plasma cortisol, an indicator of physiological stress, did not increase during the day in juvenile chinook salmon sampled in side channels with no boat traffic. When boats were selectively passed through a second side channel, cortisol levels did not increase during days when kayaks or driftboats passed, but increased in the late afternoon during days when motorboats passed. However, similar experiments conducted in the main channel of the Rogue River indicated that plasma cortisol levels in the main channel of the Rogue River indicated that plasma cortisol levels did not increase during the day in areas with and without tour-boat traffic.

Underwater observations in the Chetco River, where boat traffic is minimal, and in the Rogue River, where boat traffic is common, indicated that most juvenile salmonids exhibited behavioral responses when boats passed directly overhead. In contrast, few juvenile salmonids exhibited behavioral responses when boats passed at a lateral distance of 5 m from fish. These findings suggested that boats must pass close to juvenile salmonids to stimulate behavioral responses noticeable to observers.

Underwater observations in both rivers indicated that boat type affected behavioral responses of juvenile chinook salmon and steelhead O. mykiss. In general, fish responded more often to overhead passes by kayaks and driftboats than to overhead passes by motorboats. However, among those fish that reacted when boats passed overhead, behavior responses were more pronounced among fish passed by motorboats than among fish passed by kayaks or driftboats.

Underwater observations in the Chetco River indicated that boat type had minimal, if any, effect on the selection of habitat by yearling or older (age ≥ 1) juvenile steelhead. Underwater observations at the confluence of the Rogue and Illinois rivers suggested that overhead passes by tour boats may have affected the numbers of age ≥ 1 juvenile steelhead in the sampling area, but that fish began to return to residence sites while tour boats continued to pass.

Analysis of digestive tracts showed that Umpqua squawfish Ptychocheilus umpquae commonly consumed juvenile salmonids in the Hellgate Recreation Section. In spring 1994, salmonid prey were found more often in squawfish collected upstream of Hog Creek (the area with most tour-boat traffic) than in squawfish collected farther downstream (an area with minimal tour-boat traffic). Spatial difference in the tendency for squawfish to prey on juvenile salmonids was likely related to spatial differences in prey abundance. Chinook salmon fry composed most of the salmonid prey and were probably more abundant upstream of Hog Creek as compared with downstream of Hog Creek.

In summer, the number of potential salmonid prey becomes more equal in areas upstream and downstream of Hog Creek because juvenile chinook salmon migrate through both areas. Results from sampling in the summers of 1993 and 1994 indicated that the incidence of salmonid prey did not differ significantly among squawfish collected upstream and downstream of Hog Creek.

BLM's Juvenile Fish Study (Oregon Department of Fish and Wildlife. 1995) — The following is the study's recommendations in their entirety.

1. *Present regulations administered by the Bureau of Land Management restrict operations of tour boats in the Hellgate Recreation Section of the Rogue River to the period of 1 may through 30 September with a maximum of 19 round trips daily. Tour-boat sizes are limited to two boats 42 feet long and while other boats must be less than 36 feet long. Project findings indicated that additional constraints to tour-boat operations are not likely to increase the production of juvenile salmon and steelhead that reside in, or migrate through, the Hellgate Recreation Section (see Recommendation 3 for a possible exception).*
2. *Operations of private motorized boats and non-motorized boats in the Hellgate Recreation Section are not presently regulated by the Bureau of Land Management, except for guided fishing trips in motorized boats, which are limited to three permits. Project findings indicated that constraints to the operation of these types of boats are not needed to protect the production of juvenile salmon and steelhead that reside in, or migrate through, the Hellgate Recreation Section (see Recommendation 3 for a possible exception).*
3. *Horton (1994) found that operation of motorized boats can increase the mortality rate of juvenile salmonids when the fish are resident in gravel nests as eggs and alevins. The Bureau of Land Management, in consultation with other federal and state agencies, should examine the results of Horton (1994) to refine management strategies designed to protect eggs and alevins of fall chinook salmon and winter steelhead that spawn in the Hellgate Recreation Section of the Rogue River.*

NEPA Design Group's interpretive conclusion of the two studies and the DEIS is that slow moving rafts and drift boats as well as people on shore and anglers wading in the spawning beds adversely effect adult spawning behavior more than the passing of motor boats, especially if the boats were more than a few feet away from the spawning activity.

2. Recommendations. It is recommended that a cumulative impact analysis (see 40 CFR 1508.7 — Cumulative impact and Appendix B) be developed for a supplemental DEIS. It is recommended that the cumulative impact on fall chinook salmon spawning, courtship display, redd building, and fertilization be developed for all disturbance activities (e.g., slow moving rafts and drift boats, people on shore, and anglers wading in the spawning beds, motor boats passing over these areas, etc.), not just an analysis of motor boats and angling. Are cumulative impacts resulting from individually minor but potentially collectively significant human recreational activities taking place over a period of time in the Hellgate RAMP area?

3. *The Rogue River is a major migration corridor for salmon and steelhead year around.*

3. Comments. We agree with the statement, but do not understand how it was used in the fisheries impact analysis. The fisheries impact analysis appeared to focus solely on the impact to fall chinook populations (not steelhead) with the impact indicators being eggs in redds and adult spawning behavior. How is the issue of the Rogue River being a migration corridor for fall chinook important to understanding the possible impacts to fall chinook?

3. Recommendations. It is recommended that the migration factor/assumption be explained as to its use and value in the impact analysis, and if not, removed from Appendix G.

4. *Spring chinook spawn upstream from the HRA above the fall chinook.*

4. Comments. How is the issue of spring chinook spawning important to understanding the possible impacts to fall chinook (see comments for factor 3)?

4. Recommendations. It is recommended that the spring chinook spawning factor/assumption be explained as to its use and value in the impact analysis, and if not, removed from Appendix G.

5. *Motorized tour boat use has increased and fall chinook numbers have slightly increased.*

5. Comments. How is this factor/assumption being used? The BLM visitor use study[2] identified 8,000 visitors to the Hellgate Recreation Area by MTB in 1973 and 1,067 MTB watercraft trips in 1985 (Table 2, page 8). Table 4-6 in the DEIS (page 243) identified 72,860 visitors by MTB in 1991. Table 4-7 in the DEIS (page 243) identified 1,661 MTB watercraft trips in 1991. In summary, it is agreed that MTB use has increased significantly (i.e., visitor use increased over 900 percent from 1973 to 1991 and watercraft use increased over 50 percent from 1985 to 1991).

The statement that the fall chinook numbers have slightly increased is not supported in the record. What is supported is that the healthy native population of fall chinook has fluctuated widely in the last few decades at the same time as a 900 percent increase in visitor use by MTBs. The DEIS documents the following statement (page 189).

> *Fall chinook have increased over the decades and represent one of the healthiest fisheries in Oregon, if not the world.*

A statement that fall chinook represent one of the healthiest fisheries in Oregon, if not the world is a very powerful conclusion. What facts is it based on? This statement is in conflict with many other statements representing concern from human impacts. How are the human impacts different now, or going to be different in the future?

The BLM's background paper for fisheries[3] identified the following for fall chinook salmon populations (page 6).

> *"Freshwater returns of adult fish have varied extensively, ranging from 18,200 to 98,300 between 1974 and 1986. Average freshwater escapement averages 45,000 (ODFW 1992d). A long-term population trend is not apparent."*

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[2] Austermuehle, Louise. 1995, 2nd Ed. *Visitor use background paper for revising the Hellgate Area Management Plan*. USDI, Bureau of Land Management. Medford, OR.

[3] Bessey, Bob. 1993. *Fishery resources background paper for revising the Hellgate Recreation Area Management Plan*. USDI, Bureau of Land Management. Medford, OR.

The Hellgate RAMP/DEIS identified the following for fall chinook salmon populations.

> *"The Grants Pass (Grants Pass to the confluence of the Applegate River) and the Applegate and Dunn reaches are the three major river reaches in the planning area. Populations trends of fall chinook originating from the mainstem Rogue River have fluctuated; however, they have increased over the decades. The average fall chinook population prior to 1991 was 45,000 fish annually in the Rogue River. Fourteen percent of the population occurs in the planning area. The overall fluctuation in the Rogue River population is from 4,000 to 95,000 annually. This trend may indicate that the planning area population fluctuates as well (ODFW 1994)."*

The Hellgate RAMP/DEIS also identified the following impact assumption (page 123) without any supporting rationale.

> *"A general assumption is that the level of visitor use and watercraft use (above the 1991 level) may produce significant fish mortality."*

BLM's Juvenile Fish Study — (Oregon Department of Fish and Wildlife. 1995) does not support a finding that increased visitor use and watercraft use may produce significant fish mortality.

Data from spawning survey conducted in 1974-93 suggested that the importance of the Hellgate Recreation Section as a spawning area for fall chinook salmon was not related to an index of tour-boat traffic. Although passenger trips on tour boats tripled during the 1980s (Walker and Austermuehle 1994), there was no indication that the increase in boat trips or boat size was associated with a change in the importance of the Hellgate Recreation Section as a spawning area (Figure 4). While passenger trips do not equate to the number of boat trips, the analysis remains relevant because of the potential impacts of boat size as well as the number of boat trips. (ODFW 1995, page 15).

These findings indicate that the increase in the relative importance of the Hellgate Recreation Section as a spawning area coincided with increases in the number of tour-boat trips and the size of the tour boats. Relative to spawning areas without tour-boat traffic, the importance of the Hellgate Recreation Section as a spawning area should have decreased if tour boats negatively affected the survival rate of juvenile fall chinook salmon. This conclusion assumes that fall chinook salmon return to spawn in the same areas in which their parents spawned. Homing to spawn in natal areas is a life history trait among anadromous salmonids. (ODFW 1995, page 17).

Figure 4 of BLM's Juvenile Fish Study (page 16) is a clear visual representation of the huge increase in MTB traffic in the last few decades along with a slight increase in spawning during that same period. If there is any correlation it is that both MTB traffic and spawning are increasing.

In summary, it is not understood the value and the meaning of the factor/assumption that *"Motorized tour boat use has increased and fall chinook numbers have slightly increased."* How is the issue of increased visitor use by MTB and a slight increase (if true) in fall chinook numbers important to understanding possible adverse impacts to fall chinook? It is also not understood why a <u>general assumption</u> is that the level of visitor use and watercraft use (above the 1991 level) may produce significant fish mortality. What is the basis for this general assumption?

In summary, it is known that for over two decades MTB use increased significantly (i.e., visitor use increased over 900 percent from 1973 to 1991) during the same time BLM believes the fall chinook population increased slightly so that today the population represents one of the healthiest fisheries in Oregon, if not the world.

5. Recommendations. It is recommended that the migration factor/assumption number 5 be explained as to its use and value in the impact analysis, and if not, removed from Appendix G. It is also recommended that supporting rationale be provided for the "general assumption," and if not, it be removed from the DEIS, including Appendix G.

6a. *Potential disturbance to spawning salmon from boats is possible when they pass close to salmon.*
6b. *Disturbance to eggs in the redds or nests is possible when boats pass over a redd.*

6a. Comments. We are not certain how the first sentence of factor/assumption 6 is different from factor/assumption 2; we believe they impart the same meaning. Our observations are the same as for factor/assumption 2.

6a. Recommendations. Our recommendation is the same as for recommendation 2.

> *"It is recommended that a cumulative impact analysis (see 40 CFR 1508.7 — Cumulative impact and Appendix B) be developed for a supplemental DEIS. It is recommended that the cumulative impact on fall chinook salmon spawning, courtship display, redd building, and fertilization be developed for all disturbance activities (e.g., slow moving rafts and drift boats, people on shore, and anglers wading in the spawning beds, motor boats passing over these areas, etc.), not just an analysis of boats passing over these areas. Are cumulative impacts resulting from individually minor but potentially collectively significant human recreational activities taking place over a period of time in the Hellgate RAMP area?"*

6b. Comments. One of the big issues is potential disturbance and mortality to eggs in redds from motorized boating during the last two weeks in September. For analysis purposes conclusionary assumptions were documented in the DEIS that moderate potential effects are probable with mortality to one egg and that this was a direct adverse significant effect (see pages 199 and 239 of DEIS). However, there is no documented analysis in the DEIS on the projected mortality to eggs nor why the mortality of one egg is a significant adverse effect. The following includes two examples of recommended impact analysis to eggs, a disagreement with the significance determination that mortality to one egg is a significant adverse impact, and a recommended standard for significance.

- Recommended Analysis — Egg mortality as a function of eggs potentially produced.
- Recommended Analysis — Egg mortality as a function of redds potentially impacted.
- Disagreement with Significance Determination.
- Recommended Standard for Significance Determination.

Recommended Analysis — Egg Mortality as a Function of Eggs Potentially Produced

Issue. What is the relationship of the low, moderate, and high potential for adverse impacts to the health of the fall chinook population as measured by population numbers? What is the significance of low, moderate, or high potential for adverse impacts? We assume a healthy and viable population is the goal for the fisheries ORV as it relates to fall chinook — We believe this population should have been described and documented in the "affected environment" chapter. However, nowhere in the DEIS is it articulated what things should look like if there was no potential conflict between fisheries and visitor use. What is the fall chinook population goal, the end objective? We are trying to protect a fall chinook fishery resource, but to what level? We don't think "We'll know it when we see it" is going to work. We believe that NEPA requires a disclosure to the public of what we are working toward, what is it going to look like when we get there? We believe a healthy and viable population of fall chinook salmon is the "standard" that should be used to estimate the potential significance effects of the alternatives. We do not understand the standard of moderate potential for effects (e.g., mortality to one egg, one fry, or one adult) being highly probable to have direct adverse significant effects (pages 199 and 239). We believe the identification of significant adverse effects of this type should have resulted in several of different alternative elements in Chapter 2 and mitigation measures identified in Chapter 4.

Why is the mortality to one egg a direct significant adverse effect (see Table 4-1, page 239 of DEIS)? Our rationale for the question follows. The affected environment chapter documented that population trends of fall chinook originating from the mainstem of the Rogue River have fluctuated; however, they have increased over the decades. The overall fluctuation in the Rogue River population is from 4,000 to 95,000 annually. The average fall chinook population prior to 1991 was 45,000 fish annually in the Rogue River. Fourteen (14) percent of the fall chinook population is believed to occur in the planning area (page 123 of DEIS). We assume 14 percent of the population means 14 percent of 45,000 which equals an average of 6,300 adult fish returning to the planning area.

The BLM background fisheries paper for revising the Hellgate RAMP (Bessey. 1993) documented freshwater returns of adult fish ranging from 18,200 to 98,300 from 1974 to 1986 with the freshwater escapement averaging 45,000 (page 6). An average of 2,300 fall chinook spawn annually in the three miles of the Rogue River between Lathrop Park downstream to the mouth of the Applegate River. Another 5,400 spawn in the river between the Applegate River and Hog Creek. All spawning areas identified in the DEIS occur between Lathrop Park and Hog Creek (see Map 3-1 on page 177 of DEIS). Therefore, we assume there are an average of 8,600 adult fish (19 percent of the population in the Rogue River) return to the impact area.

We have no idea what the average number of spawning pairs are in the Rogue River (we hope this information will be provided), or for the impact area, but for the framework of our question we will assume the returning adult populations are roughly 50 percent female and 50 percent male. This means our scenario has 22,500 female spawners in the Rogue River and 4,300 female spawners in the impact area. Each spawner produces between 3,300 to 3,500 eggs (Bessey 1993) which means there is an average production of 76,500,000 eggs produced per year in the Rogue River and 14,620,000 produced per year in the impact area. This means that somewhere in time and space between the annual production of eggs in the Rogue River and the return of that egg crop as adult fall chinook that there was a mortality of over 76,000,000 eggs, fry, or adult fish.

What is the scientific rationale that the mortality of one egg [one (1) divided by 76,500,000], or .000000013 percent of one of the healthiest fisheries in Oregon, if not the world (page 189 of DEIS)] is a significant adverse effect? What is the scientific rationale that the mortality of one egg [one (1) divided by 14,600,000], or .000000068 percent of the average fall chinook population in the impact area is a significant adverse effect? What is the annual cumulative egg mortality from all sources (e.g., sedimentation of redds, destruction of redds by floods and scouring, egg predators such as steelhead, freezing and dewatering, superimposition of redds by later spawners, human induced (i.e., boats and anglers), etc.)?

Recommendation. It is recommended that a rationale be provided as to why there is a low potential for adverse effects if there is no mortality to any eggs, fry, or adults and why there is a potential for a significant adverse impact if there is mortality to one egg, fry or adult fish. It is recommended that a cumulative impact analysis (see 40 CFR 1508.7 and Appendix B) be developed for estimating egg mortality in a supplemental DEIS. It is recommended that the cumulative impact be identified for the annual cumulative egg mortality from all sources (e.g., sedimentation of redds, destruction of redds by floods and scouring, egg predators such as steelhead, predation by squawfish, freezing and dewatering, superimposition of redds by later spawners, human induced (i.e., boats and anglers), etc.)? It is recommended that 40 CFR 1502.22 be followed if the information relevant to reasonably foreseeable significant adverse impacts to eggs cannot be obtained because the overall costs of obtaining it are exorbitant or the means to obtain it are not known.

<u>Recommended Analysis — Egg Mortality as a Function of Redds Potentially Impacted</u>

Issue. Alternative C and Alternative E (Preferred Alternative) eliminate two weeks from the MTB season of use during September 16 - 30. The identified purpose is to protect the eggs in the redds of fall chinook from potential adverse impacts of motorized boating traffic. The best professional opinion concerning the timing of spawning is from a paper (Bessey. 1993) by the Bureau of Land Management:

> *"Approximately 14 percent of spawning fall chinook use the RAMP area... Spawning in the river and major tributaries within the HRA is from mid-September to late December, with peak spawning occurring from late October to mid-November. About 10 percent of the run spawns before October 1..."*

Brief professional <u>opinions</u> have been provided in writing and orally by the State of Oregon, Department of Fish and Wildlife, and the BLM Medford District Office that there is a possible adverse impact from MTB traffic to the eggs in the redds of fall chinook during the last two weeks of September. The DEIS documented that there were 13 important spawning areas from the bottom of Iseman Stillwater to Two-Bit Riffle (pages 84 and 177); none of these areas were in the Dunn Reach. However, no information was provided on the characteristics of the spawning areas (e.g., physical size or area, relationship to width and length of river's size, depth of water from top of redd to surface of river, substrate size, depth of eggs in redds, etc.). The impacts to the fall chinook species from MTB traffic is unknown because: 1. there are no surveys, inventories, research, or studies which establish the actual occurrence of redds in the HRA during September, 2. the impacts are not identified, and if they occur are probably minuscule and 3. for almost 40 years[4] there has been a substantive presence of MTB traffic in the HRA during the last two weeks of September without a detectable adverse impact to the fall chinook species.

The importance of any possible adverse impact to the fall chinook species, if in fact significant adult spawning behavior and redds occur during the last two weeks of September, is unknown, but probably minuscule and nonsignificant. It was not documented in the DEIS, but the alleged impact is that 1.4 percent of the fall chinook species is annually adversely impacted by MTB traffic during the last two weeks of September [i.e., the 14 percent of the species that is estimated to spawn in the HRA times (x) the 10 percent of the species that is estimated to spawn in the HRA before October 1 equals (=) 1.4 percent]. This alleged impact becomes even smaller when the results of the Horton study in Alaska are taken into consideration[5] which suggests that less than one-thousandth of a percent of the fall chinook's eggs could be impacted by MTB traffic (see fishery factor/assumption 1 of this appendix for summary and recommendation quotes of the Alaska fish study).

Horton defined the conditions of egg mortality occurring from jet boats. Mortality occurred to embryos at stages 8-13 when substrate or gravel was moved and damaged the eggs, or as a result of eggs being displaced from the gravel. These conditions occurred when jet boats passed directly over the redds within one foot from the bottom of the river (i.e., 9.1" - 12.2"). Horton went on to say that mortality was non-significant at depths greater than one foot. Embryos at stages 8-13 may or may not occur (assuming spawning occurs). There are a few portions of MTB routes in the 13 spawning areas that might be close to a minimum one foot water depth. The following simple "area" analysis will not address the embryos' stages, but will consider the potential area of redds impacted.

1. examples of types and locations of spawning areas,
2. MTB routes and route widths,
3. average river width, and

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[4] Walker, M. and Austermuehle, L. 1994. Motorized tour boat history background paper for revising the Hellgate Recreation Area Management Plan. pages 4 - 5. Bureau of Land Management, Medford District Office. Medford, OR.

[5] Horton, G. E. 1994. Effects of jet boats on salmonid reproduction in Alaskan streams. Master's thesis. University of Alaska. Fairbanks, AK.

4. distances from the bottom of MTBs to the top of redds in the river.

Types And Locations of Spawning Areas. The large majority of the actual passage routes of the MTBs are greater than 20 to 30 feet from the 13 documented spawning areas. For example, the large Panther Chutes spawning area is relatively stable and on the shallow left bank side of the river upstream of Griffin Park; the constant MTB travel route is in deep water near the right bank of the river. The impact conclusion of MTB traffic to the Panther Chutes spawning area using the criteria from the Alaska study would be "no impact." There are a few spawning areas (e.g., Warton Riffle) where spawning has occurred across the entire width of the river, much of it at depths greater than two feet, but perhaps, in some places, at depths ranging from 12 inches to 18 inches. The river in the Warton Riffle spawning area is wider than the river's 300-foot average width.

The challenge of this physical impact analysis is to estimate the amount of area in redds in shallow water that might be less than one foot deep within the normal and regularly used travel routes of MTBs and, therefore, potentially impacted, and combine this estimate with the estimated amount of spawning (1.4 percent of the fall chinook species) occurring in the Hellgate Recreation Area (HRA). Spawning chinook utilize substrate 0.5 to 4 inches in diameter where minimum water depth is 0.8 feet and velocity is 1 to 3 feet per second (Bessey. 1993). The 0.8 feet water depth is very close to the MTB's 0.75 feet limit of "no-contact" on-plane navigation minimum (page 25 of boating safety study).[6] Therefore, the potential spawning habitat of interest are those areas of the river in water depths from 0.8 feet to 1 foot [i.e., areas with less than 0.8 feet of water (Bessey. 1993) are not used by spawners and according to the Alaska fish study (Horton 1994), areas with a water depths of greater than 1 foot do not have significant impacts from motorized boating to egg mortality]. It is not known, but for analysis purposes it is conservatively assumed that the rapids and narrow river portions of the river within the normal MTB travel routes where the water depth might be one foot or smaller <u>is less than five percent</u> of the combined length of the 13 documented spawning areas. This estimate is opinion and it is recommended that BLM identify the actual occurrence of the annual water depth conditions.

Substrate Size. The inventory question of the average substrate size (i.e., 0.5 to 4 inches in diameter) utilized by spawning salmon and the location of this substrate size relative to the normal and regularly used travel routes of MTBs is a important question. The river bed consists mostly of bedrock and coarse alluvial material. The latter includes boulders, cobbles, and coarse gravel (see page 98 of see erosion study[7]). Gravel sizes range from 2 to 64 millimeters, cobbles range from 2.5 to 10 inches, and boulders are larger than 10 inches in median diameter (see page

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[6] WRC - Environmental Water Resources Consulting. 1995. Rogue River boating safety and conflicts study. Prepared for the BLM Medford District Office and Oregon State Marine Board. Sacramento, CA.

[7] Klingeman, Cordes, and Nam. 1993. Rogue River erosion/deposition study. Erosion/deposition study for the BLM by Oregon State University. Corvallis, OR.

80, Klingeman 1993). Only during periods of major river discharge are flows likely to disturb the stream bed.

What scouring impacts do local storm runoff flows in bends or narrow portions of the river have on the gravel and small cobbles at the river bottom? It is assumed the smaller sized material will normally be moved to the high-water backwater and eddy zones. In other areas of low-velocity zones (e.g., areas where the main channel of the river is very wide like the bottom of Iseman Stillwater and the top of Warton Riffle) it is assumed that smaller materials (i.e., substrate size 0.5 to 4 inches in diameter) like that utilized by spawning salmon can remain behind on the bottom in the main river channel.

It is conservatively estimated that substrate size less than 4 inches in diameter in the rapids and narrow river portions of the river within the normal MTB travel routes where the water depth is less than one foot occurs five percent or less of the time. This estimate is opinion and it is recommended that BLM identify the actual occurrence of the substrate size conditions. Perhaps this is the reason that no “cause and effect” can be found between increasing visitor use and MTB traffic and increasing populations of fall chinook salmon (i.e., the overwhelming amount of area in a normal MTB route does not have the appropriate substrate size for good spawning habitat).

MTB Routes and Route Widths. The two biggest MTBs ever operated in the HRA were 14 feet wide. For analysis purposes it was assumed that all MTBs average 14 feet in width and that in their river passage they use an average 40 feet width passage through the deeper main channels of the river.

Average River Width. The Rogue River in the HRA can be characterized by riffle/run/pool channel characteristics with occasional rapids. The river in the HRA averages about 300 feet wide (page 113 of DEIS), but usable routes for power boats through some riffle and rapids narrow to around 40 feet wide (e.g., downstream entrance to Hellgate Canyon).

Egg Mortality as a Function of Redds Potentially Impacted. The average spawning population in the HRA during the last two weeks of September is assumed to be 1.4 percent of the fall chinook species annually returning to the Rogue River [i.e., the 14 percent of the species that is estimated to spawn in the HRA times (x) the 10 percent of the species that is estimated to spawn in the HRA before October 1 equals (=) 1.4 percent].

All MTBs average 14 feet in width and their average consumption of river space is a 40 foot width passage through the deeper main channels of the river. A 40-foot wide passage route for MTBs used 13 percent of the average 300-foot wide river. Five (5) percent or less of the spawning areas within the normal MTB travel routes have river depths which might be less than one foot and less than 5 percent of the river channel within the normal MTB travel routes have substrate size useable for spawning habitat.

In summary, it is assumed (i.e., opinion) that there may be an adverse effect to egg mortality less than .0007 percent of the spawning areas by motorized traffic in the last two weeks of September [i.e., 1.4 percent of the fall chinook species annually returning to the Rogue River (x) 5 percent or less of the spawning areas within the normal MTB travel routes have river depths of less than one foot equals (=) .0007 percent]. This estimate is opinion and it is recommended that BLM make projections of egg mortality.

Recommendation. It is recommended that a cumulative impact analysis (see 40 CFR 1508.7) be developed for estimating egg mortality in affected portions of spawning areas by motorized traffic during the last two weeks of September in a supplemental DEIS. It is recommended that 40 CFR 1502.22 be followed if the information relevant to reasonably foreseeable significant adverse impacts to eggs cannot be obtained because the overall costs of obtaining it are exorbitant or the means to obtain it are not known.

<u>Disagreement with Significance Determination</u> If one does not consider any kind of number analysis, the most important conclusion might be the observation that motorized boat traffic, including MTB traffic, has been occurring in the HRA for the last two weeks of September prior to the establishment of the National Wild and Scenic Rogue River in 1968. For almost 40 years there has been a substantive presence of motorized boat traffic in the HRA during the last two weeks of September without a detectable adverse impact. Native fall chinook have been, and continue to be a healthy, in-stream spawning species of the Rogue River. This species is not on any concerned list, nor on a sensitive, candidate, threatened, or endangered list of any public agency or private group.

The BLM's juvenile fish study (Oregon Department of Fish and Wildlife. 1995) arrived at the same conclusions; it does not support a finding that increased visitor use and watercraft use produce significant fish mortality (see fishery factors 2 and 5 of this appendix). The study found that spawning survey data suggested that the importance of the Hellgate area as a spawning area for fall chinook salmon was not related to an increase in MTB trips or that boat size was associated with a change in the importance of the river section as a spawning area. The increase in the relative importance of the section as a spawning area coincided with increased numbers of MTB trips and the size of the MTBs. Relative to spawning areas without MTB traffic, the importance of the section as a spawning area should have decreased if MTBs negatively affected the survival rate of juvenile fall chinook salmon.

Our analysis disagrees with the significance determination documented in the DEIS that moderate potential effects are probable with one egg mortality and that this is a direct adverse significant effect (see pages 199 and 239 of DEIS). There is no documented analysis in the DEIS on the projected mortality to eggs nor why the mortality of one egg is a significant adverse effect and our analysis suggests there is no impact or that the impact is minimal and nonsignificant.

Recommendation. It is recommended that the BLM's significance determination be explained as to its use and value in the impact analysis, and if not, removed from the DEIS. It is recommended that a healthy and viable population of fall chinook salmon be the standard by which significant impacts are estimated.

6b. Recommendations. It is recommended that BLM use and refine our two impact analysis examples and our significance disagreement and document them in a supplemental draft EIS. It is further recommended that BLM use our recommended standard of "fall chinook salmon populations" for use in significance determinations.

7. *Float craft that utilize outboard engines as kickers are more likely to travel in the shallower waters along the river's edge, outside the main channel. It is possible the use of kickers may potentially disturb chinook spawning or eggs in the gravel.*

7. Comments. We agree with the "more likely" and "it is possible" statements, but do not see how they have been used in the fisheries impact analysis. If they are used and relevant to *"...evaluating reasonably foreseeable significant adverse impacts...,"* they should be developed in compliance with 40 CFR 1502.22, *Incomplete of Unavailable Information*. The fisheries impact analysis appears to focus on the impact to fall chinook populations from MTB traffic with the impact indicators being eggs in redds and adult spawning behavior.

7. Recommendations. It is recommended that the migration factor/assumption be explained as to its use and value in the impact analysis, and if not, removed from Appendix G. If factor/assumption is used, we recommend that it be used as part of a cumulative impact analysis (see comments and recommendations for factor/assumption 2) and tested to see if it meets the standards of 40 CFR 1502.22.

8. *Steelhead spawn in low numbers in the planning area.*

8. Comments. We agree with the statement, but do not see how it has been used in the fisheries impact analysis. The fisheries impact analysis appears to focus solely on the impact to fall chinook populations (not steelhead) from MTB use with the impact indicators being eggs in redds and adult spawning behavior. How is the issue of the steelhead spawning in low numbers in the planning area important to understanding the possible impacts to fall chinook?

8. Recommendations. It is recommended that the migration factor/assumption be explained as to its use and value in the impact analysis, and if not, removed from Appendix G.

9. *The fishery analysis compares alternatives to 1991 levels or current management (see Table 4-6). Table App-G-1 summarizes some of the factors listed in each alternative considered in the fisheries analysis.*

9. Comments. The fishery analysis may in fact compare alternatives to 1991 levels or current management in Table 4-6. However, NEPA's requirement is to use the description of the affected environment as the baseline for comparisons in the impact analysis of the environmental consequences section of an EIS.

> **BLM's NEPA Handbook** (see Appendix A)"***g.*** ***Affected Environment*** *Page V-18 (required by 40 CRF 1502.10(f); also see 40 CFR 1502.15). This section should describe the components of the human environment including the physical, biological, social, and economic resources and conditions that would be affected by the alternatives considered. Descriptions should be quantified, if possible, and they should be no longer than absolutely necessary to understand the impacts of the alternatives. It is not necessary or desirable to fully describe parts of the environment that would not be affected in a significant way, although they may be noted in an introduction. This section serves as a baseline showing conditions, including trends in those conditions, as they exist prior to the initiation of the proposed action or any alternative.*"

> **CEQ's Regulations** (40 CFR 1502.15 Affected Environment, see Appendix B). *"The environmental impact statement shall succinctly describe the environment of the area(s) to be affected or created by the alternatives under consideration. The descriptions shall be no longer than is necessary to understand the effects of the alternatives. Data and analyses in a statement shall be commensurate with the importance of the impact, with less important material summarized, consolidated, or simply referenced. Agencies shall avoid useless bulk in statements and shall concentrate effort and attention on important issues. Verbose descriptions of the affected environment are themselves no measure of the adequacy of an environmental impact statement."*

The confusion may have resulted from the two requirements of 40 CFS 1502.14, *Alternatives Including the Proposed Action*, and especially the second requirement. However, neither of the two requirements of developing the alternatives change the requirement of using the affected environment section as the baseline for comparing impacts in the environmental consequences section.

> **CEQ's Regulations** (40 CFS 1502.14 Alternatives Including the Proposed Action, see Appendix B). *"This section is the heart of the environmental impact statement. Based on the information and analysis presented in the sections on the Affected Environment (Sec. 1502.15) and the Environmental Consequences (Sec. 1502.16), it should present the environmental impacts of the proposal and the alternatives in comparative form, thus sharply defining the issues and providing a clear basis for choice among options by the decisionmaker and the public."*

The first requirement of 40 CFS 1502.14, *Alternatives Including the Proposed Action*, is to design a range of reasonable alternatives around the significant planning issues identified during scoping. The alternatives section is the heart of the EIS. The requirement is to design the alternatives to sharply reflect the issues and provide a clear basis for choice among options by the decisionmaker and the public. The baseline for comparing alternatives is the no action and/or current management alternative which for the Hellgate RAMP/DEIS is Alternative B.

A second additional requirement of 40 CFS 1502.14, and just as important, is the requirement of the alternatives section in the EIS to present the significant environmental impacts of the proposal and the alternatives in comparative form, thus sharply defining the issues and providing a clear basis for choice among options by the decisionmaker and the public. This portion of the alternatives section of an EIS is based on the information and analysis which is developed in the sections on the affected environment and environmental consequences sections of the EIS. The baseline for comparing the effects in the environmental consequences section is the affected environment.

In summary, the fishery analysis in the environmental consequences section, including Appendix G assumptions, comparing alternatives to 1991 levels or current management is not in compliance with NEPA (see Appendices, A, B, C, and D).

9. Recommendations. It is recommended that fisheries analysis be redeveloped and documented in a supplemental DEIS in accordance with CEQ's procedural regulations to implement NEPA and BLM's NEPA Handbook. It is further recommended that BLM use NEPA Design Group's impact methodology described in Appendix D or refine its own impact methodology. This kind of information provides the decisionmaker and the public with a basis for understanding and judging the reliability of the impact analysis (see Appendix A and Appendix D).

10. ***Appendix G-1. Factors Affecting Each Alternative Considered for Fishery Analysis.***

10a. Comments. Table Appendix G-1 appears to be a combination of a enormous amount of information from Table 2-12, Table 4-6, and Table 4-7, but neither Appendix G nor Table Appendix G-1 explain how the information was used in the fisheries impact analysis. The fisheries impact analysis appears to focus solely on the impact from MTB use to fall chinook populations with the impact indicators being eggs in redds and adult spawning behavior.

10a. Recommendations. It is recommended that Table Appendix G-1 be explained as to its use and value in the impact analysis, and if not, removed from Appendix G.

10b. Comments. There is a major conflict in the design of alternatives for designated "fall chinook spawning/sensitive areas." Allocation statements from three different sources in the Hellgate RAMP/DEIS are in conflict with each other.

- Table Appendix G-1.
- Chapter 2, Alternatives (text).
- Table 2-1.

<u>Table G-1 documented the following for designated fall chinook spawning areas.</u>

Alternative A — No areas designated for motorized boat use.
Alternative B — No areas designated for motorized boat use.
Alternative C — No motorized boat use designated in 13 areas.
Alternative D — No motorized boat use in 4 areas.
Alternative E — No motorized boat use in 4 areas.

<u>Chapter 2, Alternatives documented the following for designated fall chinook spawning areas.</u>

Alternative A —	There are no specific areas designated as fall chinook spawning/sensitive areas (page 30).
Alternative B —	There are no specific areas designated as fall chinook spawning/sensitive areas (page 39).
Alternative C —	1. Watercraft would pass around major spawning/sensitive areas or pass through in the deep part of the channel and not stop in these areas if they extend across the river (page 47).
—	2. Motorized watercraft use would not be allowed in thirteen major areas (see Table 2-1). (page 47).
Alternative D —	Watercraft would pass around major spawning/sensitive areas or pass through in the deep part of the channel and not stop in these areas if they extend across the river (page 56).
Alternative E —	Watercraft would pass around major spawning/sensitive areas or pass through in the deep part of the channel and not stop in these areas if they extend across the river (page 66).

<u>Table 2-1 (page 84) documented the following for designated fall chinook spawning areas.</u>

Alternative A —	No areas designated.
Alternative B —	No areas designated.
Alternative C —	Protect all spawning areas: 1. Avoid major spawning areas or pass through. 2. No motorized use in thirteen spawning areas.
Alternative D —	Protect four major spawning areas: 1. Avoid major spawning areas or pass through. 2. No motorized use in four spawning areas.
Alternative E —	Protect four major spawning areas: 1. Avoid major spawning areas or pass through. 2. No motorized use in four spawning areas.

Table G-1 documents a totally different allocation for alternatives A and B than does the text for Chapter 2 and Table 2-1. Alternatives A and B document that no areas are designated for motorized boat use. These allocations are in conflict with the other two sources that document no specific areas are designated as fall chinook spawning areas.

All three sources document the Alternative C allocation of no motorized use in 13 fall chinook spawning areas. This allocation is in conflict with other elements of all alternatives as they are designed to permit some motorized boating in all 13 spawning areas.

Table G-1 and Table 2-1 document Alternative D and Alternative E allocations of no motorized use in four major spawning areas. These allocations are in conflict with the text of Chapter 2 which documents that watercraft would pass around the four major spawning/sensitive areas or

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pass through in the deep part of the channel and not stop in these areas if they extend across the river.

In summary, it is impossible for the decisionmaker(s) and the public to understand what management is being proposed for fall chinook spawning areas. The CEQ requirement to design the alternatives to sharply reflect the issues and provide a clear basis for choice among options by the decisionmaker and the public has not been met (40 CFR 1502.14). (also see appendices A, B, and D).

10b. Recommendations. It is recommended that Table Appendix G-1 be reconciled with the text of Chapter 2, Alternatives, and Table 2-1 in a supplemental DEIS.