# Finding of No Significant Impact for Issuance of an Endangered Species Act Section 10(a)(1)(A) Permit to the California Department of Fish and Wildlife (CDFW) for Activities at the Iron Gate Fish Hatchery (IGH)

National Marine Fisheries Service
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National Oceanic and Atmospheric Administration Administrative Order 216-6 (May 20, 1999) contains criteria for determining the significance of the impacts of a proposed action. In addition, the Council on Environmental Quality (CEQ) regulations at 40 C.F.R. 1508.27 state that the significance of an action should be analyzed both in terms of "context" and "intensity." Each criterion listed below is relevant to making a finding of no significant impact and has been considered individually, as well as in combination with all other criteria. The significance of this action is analyzed based on the NAO 216-6 criteria and CEQ's context and intensity criteria. These include:

**1) Can the proposed action reasonably be expected to cause substantial damage to the ocean and coastal habitats and/or essential fish habitat as defined under the Magnuson-Stevens Act and identified in FMPs?**

Response: Ocean, coastal, and/or essential fish habitat will not be substantially damaged under the proposed action. The Proposed Action is the National Marine Fisheries Service's (NMFS) proposed issuance of a permit under Endangered Species Act (ESA) Section 10(a)(1)(A) to the California Department of Fish and Wildlife (CDFW) for operation of the coho salmon program at Iron Gate Hatchery (IGH) under a proposed Hatchery and Genetic Management Plan (HGMP) for a period of 10 years if NMFS determines that the application submitted by the CDFW and PacifiCorp meets the ESA section 10(a)(1)(A) permit issuance criteria. As a result of permit issuance, CDFW would be authorized to take federally listed Southern Oregon/Northern California Coast (SONCC) evolutionarily significant unit (ESU) coho salmon resulting from implementation of the coho salmon program at IGH under a HGMP. NMFS completed an Essential Fish Habitat (EFH) consultation on the proposed action under the Magnuson-Stevens Fishery Conservation and Management Act and concluded that activities to be implemented under the proposed action are primarily biological, and will have limited adverse effects on salmon EFH (NMFS 2014). For each of the proposed action's adverse effects on EFH for salmon, the proposed action includes the best approaches to avoid or minimize those adverse effects. Therefore, NMFS did not propose additional conservation measures.

The primary purpose of the HGMP is to provide a single, comprehensive source of information regarding anadromous salmonid hatchery programs. NMFS uses this information in its ESA processes to assess impacts on listed anadromous fish. The elements of the HGMP that will have greatest impact include: (1) annual capture and directed mortality of approximately 135 to 270 adult coho salmon to use as broodstock (the goal is for 20 to 50 percent of broodstock to be natural origin [NOR]); and (2) volitional release of 75,000 yearling coho into the Upper Klamath

River based between March 1 and April 15. Neither of these elements will contribute to substantial ocean, coastal, or EFH effects.

In the Klamath Basin, EFH has been designated in the mainstem Klamath River and its tributaries from Iron Gate Dam to the mouth. EFH includes the water quantity and quality conditions necessary for successful adult migration and holding, spawning, egg-to-fry survival, fry rearing, smolt migration, and estuarine rearing of juvenile coho salmon and Chinook salmon. No adverse effects to estuarine habitat or marine habitat, including such habitat designated as EFH for coho or Chinook salmon, are expected from the proposed action because any adverse effects of the proposed action to habitat are expected to be ameliorated to an undetectable level before reaching any estuarine or marine habitat.

Potential effects on EFH from the proposed action would be similar to effects of the No-action Alternative. No significant effects on hydrologic conditions and resources are expected under the proposed action. The proposed action will have no significant impact on the quantity or consumption demand of water used for hatchery activities and the total amount of water diverted will remain small relative to the total volume of the river. Additionally, the total amount of water diverted into the hatchery is returned to the river below the hatchery. The water source for the hatchery is located in the Iron Gate Reservoir, which is not accessible to anadromous fish and is not designated as EFH. There will be no difference in the terms of water use, and the quantity of water will remain the same as currently used for hatchery practices (NMFS 2014a). Improvements to hatchery-related facilities (e.g., Bogus Creek weir) are not expected to have any perceptible effect on water availability or use.

The potential water quality effects from the proposed action will be the same as under the No-action Alternative because there is no appreciable difference between the current water quality conditions and proposed action's water quality conditions. CDFW will continue to operate the IGH pursuant to the existing National Pollutant Discharge Elimination System permit that establishes conditions for the IGH discharge to maintain compliance with the Clean Water Act. Water discharged from IGH into the Klamath River will continue to contribute minor amounts of nutrient and organic matter loading to the river, but these small loads are not expected to result in significant impacts to nutrients and algae in the Klamath River. The characteristics of the IGH discharge with regard to other water quality constituents will also likely be unchanged from current conditions (NMFS 2014a). The proposed action would include improvements to the Bogus Creek Fish Counting Facility, including installation of taller weir panels and installation of an adult trap. Installation of these structures will not disturb existing riparian vegetation, requires no disturbance to soils of the stream bank, and will result in negligible disturbance to the streambed and negligible increases in suspended sediment. Therefore, the proposed action is not expected to result in significant impacts to any water quality constituents in the Klamath River.

Under the proposed action, effects on juvenile summer and winter rearing area and juvenile migration corridor habitats could occur from the presence of hatchery fish. The amount of food in some areas could be limited at certain times of the year by hatchery fish. Space for rearing juveniles and fry could be limited by hatchery fish, particularly during low-flow periods in late summer. The presence of hatchery juveniles produced under the proposed action could limit the function of important habitat in the juvenile migration corridor from March to May due to

reductions in food and space resulting from encroachment by these juveniles. Any adverse effects experienced from the presence of juvenile hatchery fish will be the same as those that currently occur, since production goals under the HGMP will remain the same, and therefore, no increases in demand are expected on rearing space or migratory habitats from the new program. Little, if any, impacts to the adult migration corridor are expected as a result of the proposed action. When adult hatchery coho salmon return to the hatchery and spawning grounds, there is adequate migratory habitat to support salmon. Therefore, little, if any, competition would be expected between adult hatchery origin return (HOR) coho and natural origin return (NOR) adult salmon for migratory habitat.

Similarly, little, if any, impacts to spawning habitat are expected as a result of the proposed action. There is expected to be adequate habitat to support HOR and NOR salmon on the spawning grounds. None of the spawning areas where IGH coho salmon stray are at, or near, carrying capacity. Therefore, there would be little, if any, impact of HOR coho salmon on natural spawning grounds as compared to current conditions.

Therefore, NMFS believes the proposed action will have no significant impact on ocean and coastal habitats and EFH because, as described above, the proposed action is primarily biologically based; contains minimal instream modification or habitat alteration; does not include increases in the quantity of water used for hatchery facilities or change the water quality of water released from hatchery facilities; and will not have significant adverse effects on spawning, rearing, or migratory habitat.

**2) Can the proposed action be expected to have a substantial impact on biodiversity and/or ecosystem function within the affected area (e.g., benthic productivity, predator-prey relationships, etc.)?**

Response: Implementation of the proposed action will not result in significant impacts to the biodiversity or current ecosystem function because any adverse effects as a result of the proposed action will be similar to current conditions related to biodiversity, established flow regimes, sediment transport, predator/prey relationships, or other ecosystem functions. However, NMFS does anticipate an overall beneficial effect on ecosystem functions from the proposed action.

Salmonid populations in the Klamath Basin have been declining, and with these declines, ecosystem functions relying on these species have changed. Although production of hatchery origin coho salmon has helped to maintain a small population of coho salmon in the upper Klamath Basin, interactions between hatchery fish and natural spawners is likely negatively impacting the biodiversity of the remaining fish under the current coho salmon program. The HGMP contains biologically-based hatchery management strategies that are expected to contribute to the conservation of the SONCC coho salmon ESU. Implementation of the HGMP would increase egg-to-yearling survival and decrease the genetic and demographic risks of inbreeding (at the hatchery) and interbreeding between hatchery and natural origin coho salmon (on the spawning grounds), which would contribute to recovery of the SONCC coho salmon ESU. Accordingly, although there will be ongoing risks from predation, competitive interactions, and interbreeding, the conservation benefits of the HGMP outweigh the risks.

Implementation of the HGMP would support recovery of the Upper Klamath and Shasta populations of the SONCC coho salmon ESU. Implementation of the HGMP will promote management of hatchery broodstock to achieve: proper genetic integration with natural populations; local adaptation of natural and hatchery populations; minimization of adverse ecological interactions between hatchery- and natural-origin fish; and minimization of effects of hatchery facilities on the ecosystem. Achievement of these goals will benefit all of the salmonid populations in the Klamath River Basin, and will have a positive impact on biodiversity and ecosystem function.

**3) Can the proposed action reasonably be expected to have a substantial adverse impact on public health or safety?**

Response: The proposed hatchery program would not be expected to have a substantial adverse impact on public health or safely because there would be no change in the risk of exposure of hatchery workers to chemicals or pathogens. Likewise, there would be no change in the potential nutritional benefits of the hatchery programs to human health and no change in the risk of public exposure to toxic contaminants relative to current conditions.

**4) Can the proposed action reasonably be expected to adversely affect endangered or threatened species, their critical habitat, marine mammals, or other non-target species?**

Response: NMFS has reviewed the adverse effects of the proposed action on endangered and threatened species and their critical habitat through consultation under ESA section 7. This consultation resulted in a biological opinion, in which NMFS determined that the proposed action will have adverse project effects on the SONCC coho salmon ESU and its designated critical habitat to some degree, but the proposed action is not likely to jeopardize the continued existence of the SONCC coho salmon ESU and is not likely to result in the destruction or adverse modification of SONCC coho salmon ESU critical habitat (NMFS 2014). In addition, NMFS concluded that the proposed action is not likely to adversely affect the species and critical habitat with respect to the Southern Distinct Population Segment (DPS) of North American green sturgeon, Southern DPS of Pacific Eulachon, and Southern Resident killer whale DPS. The discussion in the Environmental Assessment (NMFS 2014a) regarding whether the proposed action can reasonably be expected to adversely affect endangered or threatened species, their critical habitat, marine mammals, or other non-target species is summarized below.

The proposed action would authorize take of SONCC ESU coho salmon that result from the IGH coho salmon program, while also minimizing take and adverse effects via implementation of the HGMP. Hatchery propagation of coho salmon under the HGMP will require the lethal take of adult coho salmon for broodstock and directed take from the handling and transport of adult and juvenile coho salmon. Activities authorized under the permit would include collection of 135 to 270 adult coho salmon spawners annually (up to 50 percent of which may be NOR adults) to meet the IGH's goal of producing 75,000 yearling coho salmon each year. Under current operations the egg to smolt survival is only about 30%, and as a result about 270 adult coho salmon broodstock are required to produce the target release goal of 75,000 smolts (CDFW and PacifiCorp 2014). Under the HGMP culture practices will be improved to increase egg-to-smolt survival rates. The increase in survival will be achieved by improving egg incubation conditions

and covering raceways with netting to reduce bird predation on juveniles. Egg incubation conditions will be investigated to identify measures that will further improve survival. These actions may include 1) changes to incubation methods, 2) improvements in egg rearing water quality, 3) filtering organic matter from the water source, 4) using moist-air incubation, 5) decreasing egg density in incubation trays, and 6) modifying coho salmon spawning protocol when using spawning matrix to insure milt is viable. All of these actions are anticipated to improve egg to smolt survival to 60 percent which in turn will reduce the number of coho salmon broodstock required to meet smolt release goals from 270 to 135 as the benefits from these actions are realized (CDFW and PacifiCorp 2014).

In addition to adult coho salmon taken for broodstock purposes, up to 10,500 juvenile coho salmon may be handled, transported and marked at the Bogus Creek fish weir. Juvenile outmigrant trapping at Bogus Creek or upper mainstem Klamath River is expected to result in predation of up to 3.2 percent of the trapped coho salmon subyearlings (i.e., up to 335 subyearlings). Of the coho salmon not eaten, trapping is expected to result in an annual total mortality of up to 5.7 percent of captured subyearlings (i.e., up to 599 subyearlings) and up to 7.9 percent of captured yearlings and smolts (i.e., up to 830 yearlings and smolts) at the Bogus Creek trap. Actual mortality will likely be less since these estimates were derived from the maximum observed mortality rates. The incidental mortality rate for this activity does not represent a significant reduction to the ESU and conservation benefits derived through the implementation of the HGMP including operation of the monitoring and evaluation program outweigh potential adverse effects described under the biological opinion (NMFS 2014).

The actions proposed in the HGMP are expected to reduce or eliminate factors such as low fertilization rates, juvenile culling for genetic reasons, and bird predation in raceways, further decreasing broodstock population needs so that fewer adults are needed over time. As egg to smolt survival rates improve over time the number of adult coho salmon required for broodstock will decrease from 270 to as few as 135. Thus, the adverse effect of take of coho salmon from IGH activities will be reduced under the HGMP as compared to the current hatchery program. Certain components of the current management scheme (small program size, the avoidance of jacks in the broodstock, and the lack of a genetic broodstock management program at the hatchery) have been shown to produce progeny with decreased survival rates due to lower fitness caused by inbreeding and divergence between brood years. Activities included in the HGMP that are expected to decrease these adverse effects include: development of a genetic spawning matrix to reduce sibling crosses, incorporation of jacks into the broodstock to reduce genetic divergence between brood years, incorporation of NOR adults into the broodstock (20 to 50 percent of total broodstock) to improve fitness, and adoption of a 2:1 male to female mating protocol.

Implementation of the HGMP will not change the number of yearlings produced annually. However, the HGMP incorporates measures to improve survival from one life stage to the next so that the IGH can reduce the number of NOR and HOR broodstock collected. Increasing in-hatchery survival and leaving more natural origin adult coho salmon on the natural spawning grounds is expected to increase the survival of juvenile coho salmon in the upper Klamath population unit.

Similar to current conditions, the potential for indirect adverse effects to naturally-spawned juvenile salmon will likely result from competitive and predatory interactions, disease transfer, and interbreeding between HOR and NOR coho salmon individuals in the Klamath River. Interactions will continue to occur between HOR coho salmon and NOR coho salmon, Chinook, and steelhead. Based on the time and size at release, hatchery coho salmon yearlings may prey on naturally-produced coho, steelhead, and Chinook fry. Modeling results indicate that hatchery coho salmon induced mortality rates upon natural coho salmon in the Upper Klamath River population unit via predation, competition, and disease is approximately 6 percent of juveniles that interact with hatchery juveniles (CDFW 2012). The impacts of this predation on NOR coho are expected to be relatively minor given the small number of fry in the main stem at the time when yearling HOR coho salmon would be migrating and the relatively low number of HOR coho salmon released from IGH. The impacts on Chinook and steelhead are expected to be similarly minor due to the large population sizes of both species in the Klamath River. Implementation of a smolt characteristic index to ensure "smolt ready" fish are released will decrease the temporal overlap between species, and decrease the potential for interactions between HOR and NOR fish in the natural environment. Physiological smolt characteristics (gill Na+, K+ and ATPase activity) are an indirect measure of seawater tolerance and migration speed. Under the HGMP, these characteristics will be monitored to determine the physiological condition of the hatchery smolts to be released relative to natural origin fish in the Upper Klamath River population unit. The collection of these data will help ensure that most or all released fish are physiologically ready to migrate rapidly to the ocean and successfully transition into saltwater.

Spawning by HOR coho salmon will be reduced in Bogus Creek and likely in other tributaries with the implementation of the HGMP. Once the immediate threat of demographic extinction is reduced, the HGMP calls for achieving a recommended proportion of natural influence (PNI) value greater than 0.5 in Bogus Creek and reducing hatchery strays to other streams over time. This would ensure that the natural environment, and not the hatchery, would be driving the larger population. The achievement of these objectives is expected to increase population fitness, abundance, and productivity.

Under the proposed action, there is potential for adverse effects related to competition between HOR coho salmon and NOR coho salmon, Chinook, and steelhead under the proposed action. Because the release of HOR smolts from the hatchery coincides with the migration of NOR coho salmon, Chinook salmon, and steelhead, there is the potential for competition in areas where there is limited migratory habitat. Given the low number of coho salmon in the Klamath River, it is anticipated that there will be adequate migratory habitat available for all species. Competition between IGH juveniles and NOR juveniles is expected to be low given the short residence time (average 22 days; Beeman et al. 2012) of HOR yearling in the Klamath River and the low number (75,000) of IGH coho salmon yearlings released, and implementation of the smolt indices so that HOR smolts released from IGH are ready for migration to the estuary and ocean environments, and will be less likely to residualize, compete, and predate on NOR coho salmon in the system. Competition between adult HOR coho salmon and NOR adult salmon for spawning habitat is not expected because the abundance of spawners on the spawning grounds in the Klamath River are expected to remain low.

Adverse disease effects on NOR adult salmon from the direct release of juvenile coho are not expected under the proposed action. However, because hatchery coho salmon are susceptible to infection by the myxosporean *Ceratomyxa shasta*, returning adult coho salmon that spawn naturally may increase the prevalence of this organism and increase disease load in the Klamath River Basin by increasing the quantity of fish on the natural spawning grounds and therefore, increasing the quantity of fish that can pass on the disease. This will not significantly change under the proposed action, so significant disease effects on NOR salmon associated with the proposed action are not anticipated.

Adverse effects on adult migration corridors as a result of the proposed action are not likely to occur. At the time when adult hatchery coho salmon return to the hatchery and spawning grounds, there is adequate migratory habitat to support salmon. Therefore, little, if any, competition would be expected between HOR coho and NOR salmon for migratory habitat. Similarly, adverse effects to spawning habitat are not likely to occur from the proposed action. There is expected to be adequate habitat to support HOR and NOR salmon on the spawning grounds. None of the spawning areas where IGH coho stray are at, or near, carrying capacity. Therefore, there would be little, if any, impact of HOR coho salmon on natural spawning grounds.

Effects to other threatened and endangered species, non-listed marine mammals and other non-target species under the proposed action will remain the same as under the No-action Alternative. There will be no changes in the quantity of hatchery Chinook salmon released from IGH, which will allow the quantity of available prey for marine mammals to remain relatively the same as under current conditions. Additionally, the HGMP will be implemented at IGH, which is approximately 190 miles upriver from the Klamath River estuary or any marine environments where marine mammals are found. There will also be no significant adverse effects to fish eating birds since the number of fish produced will remain the same as under current management practices.

Because of the overlap in the lower Klamath River and estuary between the emergence of fry eulachon and migration timing of coho salmon smolts in the spring, there would be a potential for predation on and competition with eulachon by hatchery coho salmon smolts. Fry eulachon occur in the water column and move downstream with the prevailing currents into pelagic areas where they begin to feed on small plankton (e.g., copepods and euphausiids). Fry eulachon are semitransparent and very small making them more difficult to spot in the water column. Coho salmon are generally present along shorelines in areas with abundant cover where they typically feed during the day and prefer aquatic insects at the surface of a stream, such as mayflies, caddis flies, and stoneflies. Juvenile eulachon are plankton-feeders, chiefly eating crustaceans such as copepods and euphausiids in pelagic and open water habitats. Differences in habitat selection and in the diets of the two species, along with the abundance of alternative prey items available to juvenile coho salmon in the Klamath River, greatly reduce the likelihood that these two species would use similar habitat types within the lower Klamath River and estuary. Therefore, predation on and competition with eulachon by hatchery juvenile and smolt coho salmon is unlikely to occur and is not expected to result in significant impacts to eulachon.

Adult coho salmon may prey on eulachon in the marine and estuarine environments (Gustafson et al. 2010). Therefore, adult coho salmon produced by the program may consume some eulachon during their ocean migration. However, given the number of hatchery adults produced by the program (less than 1,500 on average) and the large prey base of other species available for coho salmon to consume in the ocean, adult coho salmon produced by the program are unlikely to significantly affect eulachon. NMFS issued a final rule designating critical habitat for the Southern DPS of eulachon on October 20, 2011 (76 FR 65324). The designation includes the Klamath River from the mouth upstream to the confluence with Omogar Creek at about RM 8, but it excludes lands of the Resighini Rancheria and Yurok Tribe. Because IGH is located far upstream of critical habitat designated for the Southern DPS of Pacific eulachon, the proposed action will not result in any temporary or permanent disturbances to river substrate or banks in the lower Klamath River, and the proposed action is not likely to adversely affect any prey resources or migration corridors utilized by Pacific eulachon, NMFS does not anticipate that the proposed action is likely to adversely affect any essential features of critical habitat for the southern DPS of Pacific eulachon where it is designated. Therefore, the proposed action is not likely to adversely affect critical habitat of the southern DPS of Pacific eulachon.

Predation by coho salmon is not likely to significantly affect juvenile Pacific lamprey due to the small number of hatchery smolts released (75,000) under the proposed action, the diversity of other prey items utilized by coho salmon juveniles, and the relatively high fecundity of larvae produced by Pacific lamprey spawners. Coho salmon are prey for adult Pacific lamprey. The coho salmon adults produced by the hatchery program will provide a food source for Pacific lamprey in both the marine and freshwater periods of their life cycle. Therefore, the proposed action is not likely to significantly affect Pacific lamprey.

Northern DPS green sturgeon enter the Klamath River between March and July to spawn and some adults remain in river until the first fall freshets trigger emigration downstream. Northern DPS green sturgeon are not thought to ascend the lower Klamath River beyond Ishi Pishi Falls at river mile (RM) 66 (NMFS 2005), which is about 125 miles downstream of IGH. The Southern DPS of North American green sturgeon is listed as a threatened species, and includes all green sturgeon spawning populations south of the Eel River, with the only known spawning population being in the Sacramento River. Sub-adult and adult Southern DPS of green sturgeon enter coastal bays and estuaries north of San Francisco Bay, CA, during the summer months to forage (Lindley et al. 2008). In the Klamath River, the occurrence of Southern DPS green sturgeon is limited to the lower Klamath River and the estuary. IGH operations are not expected to significantly affect the physical, chemical, and biological conditions within the lower Klamath River. Additionally, the Biological Review Team (BRT) noted that current threats to Klamath River green sturgeon are increased river temperatures, reduced oxygen concentrations, and the alteration of the river flow regime (NMFS 2005). Salmon hatchery operations or production were not listed as a threat to green sturgeon in any river examined by the BRT. Because of the upriver IGH location and recognition by the BRT that hatchery production does not pose a threat to green sturgeon in the lower Klamath River, the proposed action is not likely to significantly affect green sturgeon. Critical habitat for the southern DPS of North American green sturgeon is not designated in the Klamath River or Rogue River and NMFS does not anticipate that the proposed action will have an effect on waters offshore from the Klamath River or Rogue River estuaries, where critical habitat for the southern DPS does occur.

Given an expected 1 percent smolt-to-adult survival ratio, NMFS expects continued IGH operations to result in approximately 60,000 adult Chinook salmon annually that may be available as prey resources for marine mammals, including the threatened Southern Resident killer whale DPS. Implementation of the HGMP for the coho salmon program will not change the quantity of available Chinook salmon and may increase the number of coho salmon, which could be utilized as prey for marine mammals. Therefore, the proposed action is not likely to significantly affect marine mammals, including the threatened Southern Resident killer whale DPS. Critical habitat for the Southern Resident killer whale DPS includes approximately 2,560 square miles of marine waters in three specific areas: 1) the Summer Core Area in Haro Strait and waters around the San Juan Islands; 2) Puget Sound; and 3) the Strait of Juan de Fuca (71 FR 69054; November 29, 2006). Critical habitat designated for the threatened Southern Resident killer whale DPS is outside of the area that will be affected by the proposed action.

Critical habitat for the SONCC coho salmon ESU includes all accessible waterways, substrate, and adjacent riparian zones between the Mattole River in California, and the Elk River in Oregon, inclusive (64 Fed. Reg. 24049; May 5, 1999). Excluded are: (1) areas above specific dams identified in the Federal Register notice, (2) areas above longstanding natural impassible barriers (i.e., natural waterfalls), and (3) tribal lands.

The artificial propagation program will take place at the Iron Gate Hatchery, on the main stem Klamath River, approximately 190 miles upstream from coastal and ocean habitats. The proposed action does not contain any instream restoration or habitat related conservation measures. The proposed action includes improvements to the Bogus Creek Fish Counting Facility, including installation of taller weir panels and installation of an adult trap. Installation of these structures will not disturb existing riparian vegetation, requires no disturbance to soils of the stream bank, and will result in negligible disturbance to the streambed and negligible increases in suspended sediment. Under the proposed action, the total number of coho salmon smolts released will be more closely regulated as compared to past practices that allowed for the release of surplus smolts. Close regulation of releases will decrease the demand of HOR fish on essential habitat types associated with critical habitat designated for the SONCC coho salmon ESU, which will provide a small, beneficial effect.

Under the proposed action, effects on juvenile summer and winter rearing area and juvenile migration corridor habitats could occur from the presence of hatchery fish. The amount of food in some areas could be limited at certain times of the year by hatchery fish. Space for rearing juveniles and fry could be limited by hatchery fish, particularly during low-flow periods in late summer. The presence of hatchery juveniles produced under the proposed action could limit the function of important habitat in the juvenile migration corridor from March to May due to reductions in food and space resulting from encroachment by these juveniles. Although there is expected to be competition under the proposed action between HOR coho salmon and NOR coho, competition between IGH juveniles and NOR juveniles is also expected to be low given the short residence time (22 days) of HOR yearling in the river, the low number (75,000) of IGH coho yearlings released, and implementation of the smolt indices so that HOR smolts released from IGH are ready for migration to the estuary and ocean environments, and will be less likely to residualize and compete with NOR coho salmon in the system.

Little, if any, impacts to the adult migration corridor are expected as a result of the proposed action. At the time when adult hatchery coho salmon return to the hatchery and spawning grounds, there is adequate migratory habitat to support salmon. Therefore, little, if any, competition would be expected between adult HOR coho salmon and NOR adult salmon for migratory habitat.

Similarly, little, if any, impacts to spawning habitat are expected as a result of the proposed action. There is expected to be adequate habitat to support HOR and NOR salmon on the spawning grounds. None of the spawning areas where IGH coho stray are at, or near, carrying capacity. Therefore, there would be little, if any, impact of HOR coho on natural spawning grounds as compared to current conditions.

**5) Are significant social or economic impacts interrelated with natural or physical environmental effects?**

Response: No significant effects on regional population and employment are expected. IGH employs seven permanent positions. The proposed action has the potential to result in the employment of more personnel to carry out activities required by the HGMP (such as spawning surveys, smolt trapping, broodstock genetic analysis, etc.). The impact of implementation of the proposed action on regional employment is expected to remain relatively small.

The IGH's contribution to the social and economic value of tribal, recreational, and commercial salmon fisheries in the Klamath River Basin could be enhanced by HGMP actions. Economic benefits to the region from these fisheries include revenue generated through fish sales; jobs provided through commercial fishing and fish processing occupations; purchase of boats, boat repair services, equipment, and fuel from local businesses; and the purchase of food and lodging at local motels and restaurants. However, the current ESA-listing status of coho salmon limits the ability of the region to fully benefit from salmon fisheries by limiting the opportunity to harvest surplus unlisted salmon intermingled with listed coho salmon in traditional harvest areas.

Improvements in the prospects for recovery of the listed coho salmon through HGMP hatchery, research, and monitoring and evaluation activities, and complementary habitat and harvest management actions are expected to provide benefits to the regional salmon fisheries. Under the Proposed Action, PacifiCorp would continue funding 100 percent of hatchery operations and maintenance costs pursuant to the Klamath Hydroelectric Settlement Agreement (KHSA; KHSA 2010). These costs will be borne by PacifiCorp customers in the six western states in which PacifiCorp operates, but would constitute only a small fraction of overall costs to customers (NMFS 2012a).

**6) Are the effects on the quality of the human environment likely to be highly controversial?**

Response: No. Although the proposed action is related to larger conservation issues in the Klamath River Basin that are controversial, for example the KHSA, the proposed action itself is not highly controversial. The effects of the proposed hatchery programs as described in the

proposed HGMP are not highly controversial because their effects are consistent with implementation of other hatchery programs and are beneficial to the affected human communities. Under the proposed action, IGH will be operated to conserve the listed SONCC coho salmon ESU. The HGMP is built around the principles and recommendations of the Hatchery Scientific Review Group (2004) and more recently, the California Hatchery Scientific Review Group (2012) recommended that the draft HGMP for the coho program should be approved and implemented. These principles and recommendations represent the best science available for operating hatchery facilities consistent with the conservation of salmonid species.

No comments were received in response to the proposed action analyzed in the draft EA. This is an indication that the methodology and best available information used to analyze effects are not highly controversial to the public.

**7) Can the proposed action reasonably be expected to result in substantial impacts to unique areas, such as historic or cultural resources, park land, prime farmlands, wetlands, wild and scenic rivers, essential fish habitat, or ecologically critical areas?**

Response: The proposed action would not adversely impact unique areas, cultural or historic resources, park land, prime farmlands, wetlands, wild and scenic rivers, essential fish habitat, or ecologically critical areas (see response to Question 1 regarding effects to essential fish habitat). The proposed action activities would not occur within any area designated or qualified as unique, park land, wetland, or prime farmland; therefore, no effects would occur to these areas either directly or indirectly. The Klamath River is designated as a Wild and Scenic River (WSR), and the proposed action is expected to improve the resources of this WSR compared to its current condition by improving fisheries resources. Improvements include increases in the abundance of native, wild salmonids; improvements in genetic and life history diversity; and decreases in the influence of HOR coho salmon in the Klamath Basin. Under the proposed action, no effects on cultural resources are expected because no prehistoric or archaeological resources are known to occur within the IGH area, and no activities would occur under the proposed action that could cause disturbance to other sites in the vicinity.

**8) Are the effects on the human environment likely to be highly uncertain or involve unique or unknown risks?**

Response: Effects on the human environment are fairly well-known (e.g., indirect impacts to wild fish through predation and competition, impacts to fishery resources indirectly affecting tribal resources, changes to genetics of salmon populations). Although there are some uncertainties involved in the on-going operation of hatchery programs, the risks are understood, and the proposed hatchery program includes explicit steps to monitor and evaluate these uncertainties in a manner that allows timely adjustments to minimize or avoid adverse impacts.

Improvements to the hatchery coho salmon program under the proposed action are intended to provide mitigation for the take of natural spawning coho salmon, and will provide improvements to the overall population through management of hatchery broodstock to achieve proper genetic integration with, or segregation from, natural populations; promotion of local adaptation of natural and hatchery populations; minimization of adverse ecological interactions between

hatchery- and natural-origin fish; and minimization of effects of hatchery facilities on the ecosystem. Risks associated with activities under the proposed action are not unique or unknown; they have been assessed under prior permit approvals, and are similar to other ongoing HGMP programs outside of the action area.

**9) Is the proposed action related to other actions with individually insignificant, but cumulatively significant impacts?**

Response: Development of an ESA section 10(a)(1)(A) permit application and the development and implementation of an HGMP for the IGH coho salmon program is occurring within the larger context of national interest in the Klamath River, its fisheries, and restoration and the interests of tribal fisheries, tribal trust resources, hatchery interests, and listed species recovery. Hatchery operations, hatchery reform, and salmon recovery are also related to several larger, overarching plans, agreements, and regulatory requirements within which the proposed action operates. These related and foreseeable actions are not anticipated to have an adverse cumulative effect on the human environment because their goals and objectives are to assist with species conservation and recovery. Therefore, the addition of the proposed action to these related actions is not anticipated to cause an adverse cumulative impact on the human environment since the goal of this action is also to enhance the propagation and survival of the SONCC coho salmon and to improve HGMP practices in the action area.

As an example of the related actions between other ongoing plans and the proposed action, the permit term of 10 years includes the interim period prior to when mainstem Klamath River dams of the Klamath Hydroelectric Project (Federal Energy Regulatory Commission Project No. 2082) are anticipated to be removed pursuant to the KHSA if there is an affirmative determination by the Secretary of the Interior as described in the KHSA or fish passage facilities are constructed and operated at the Project facilities if dam removal does not occur under the KHSA and the Project is relicensed by FERC. This permit would authorize take associated with implementation of the coho salmon hatchery program under a proposed HGMP for IGH during that interim period. Revised hatchery management goals and strategies will be developed by CDFW and NMFS in response to reintroduction of coho salmon to habitat above Iron Gate Dam (KHSA 2010). At that time, a new HGMP would be developed for any new or revised programs at Iron Gate or other hatchery facilities in the area.

**10) Is the proposed action likely to adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural or historical resources?**

Response: The proposed action would not affect any districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places. Similarly, the proposed action is not likely to cause any loss or destruction of scientific, cultural, or historical resources primarily because the proposed action covered activities will occur within active stream channels and within existing facilities (Iron Gate Dam and Iron Gate Fish Hatchery). Under the proposed action, no effects on cultural resources are expected because no prehistoric or archaeological resources are known to occur within the IGH area, and no activities would

occur under the proposed action that could cause disturbance to other sites with prehistoric or archaeological resources in the vicinity.

**11) Can the proposed action reasonably be expected to result in the introduction or spread of a nonindigenous species?**

Response: The proposed action does not involve the introduction, removal, or movement of any non-indigenous species into or out of the action area. The species involved in the proposed restoration activities are native to the study region (coho salmon), and common handling and movement methods will be used where necessary, which are not known to introduce or lead to the spread of nonindigenous species. The HGMP would not introduce non-native species or expand their current range.

**12) Is the proposed action likely to establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration?**

Response: The proposed hatchery program is not likely to establish a precedent for future actions with significant effects or to represent a decision in principle about a future consideration because the proposed hatchery programs are similar in nature and scope to similar hatchery actions over the past several years. Other HGMPs involving captive breeding or supplementation in the Pacific Northwest (e.g., Snake River fall Chinook salmon and Hood Canal Summer Chum salmon hatchery programs) have been analyzed through similar ESA determinations and NEPA reviews.

Like other similar hatchery programs already reviewed, implementation monitoring is a key element of the proposed hatchery programs, which would improve information regarding the effects of the program. The proposed hatchery program would use and support precedence already set for monitoring and adaptive management, which is expected to reduce risk of significant effects occurring now or in the future.

Finally, the issuance of an ESA section 10(a)(1)(A) permit to CDFW is a singular action considered for the interim period until dam removal occurs or fish passage facilities are constructed and operated at dams on the Klamath River mainstem, which would result in changes to hatchery operations that cannot be determined at this time. This proposed action is specific to the IGH coho salmon propagation program for this interim period.

**13) Can the proposed action reasonably be expected to threaten a violation of Federal, State, or local law or requirements imposed for the protection of the environment?**

Response: The proposed action is not expected to result in violations of federal, state, or local requirements for protection of the environment. Issuance of an ESA section 10(a)(1)(A) permit to CDFW will be in compliance with all federal, state, or local laws or requirements imposed for the protection of the environment.

**14) Can the proposed action reasonably be expected to result in cumulative adverse effects that could have a substantial effect on the target species or non-target species?**

Response: The proposed action, as described in the HGMP (CDFW and PacifiCorp 2014), will improve hatchery broodstock collection, incubation, rearing, and release practices. NMFS believes that the HGMP will generally have a beneficial effect on relationships between the target species and the non-target species that they interact with by decreasing indirect effects caused by an abundance of hatchery fish. Decreasing the residence time of hatchery reared coho salmon, re-releasing unspawned adult coho salmon, and improving hatchery broodstock collection will decrease the indirect effects on Chinook salmon and steelhead that occupy the same habitat as hatchery reared fish by decreasing the interaction time, decreasing predation and competition, and increasing the proportion of natural spawners in the Upper Klamath Basin.

The proposed action will result in implementation of biologically-based hatchery management strategies that are expected to contribute to the conservation and recovery of SONCC coho salmon. Implementation of the HGMP under the proposed action would increase egg-to-yearling survival and decrease the genetic and demographic risks of inbreeding (at the hatchery) and hatchery and natural interbreeding (on the spawning grounds) further aiding recovery of the SONCC coho salmon ESU. Accordingly, although there are still risks from predation, competitive interactions, and interbreeding the conservation benefits of the proposed action outweigh the risks associated with proposed action. Implementation of the HGMP would support recovery of the Upper Klamath River and Shasta River population units that might otherwise continue to decline irreversibly. The overall reduction in take, improved genetic makeup of the broodstock, and improved rearing survival are expected to result in an overall beneficial effect on anadromous salmonid species and are not expected to result in significant adverse effects to anadromous salmonid species. Based on these factors, the proposed action is not expected to contribute to any significant adverse cumulative impacts on fish species.

Production from IGH contributes to commercial, tribal, and recreational fisheries in the Klamath River Basin and the Pacific Ocean. Under the proposed action commercial, tribal, and recreational fishing would continue to benefit from operation of the salmon production program at IGH because hatchery-produced salmon supplement these fisheries. Under the proposed further increases in coho salmon abundance and productivity are more likely to occur, contributing to the conservation and recovery of the species, and subsequent resumption of directed fisheries in the future. The proposed action is not expected to have significant effects on hydrology and water use in the Klamath River. As such, the proposed action would not contribute to any significant adverse cumulative impacts to hydrology and water use in the Klamath River. The Klamath River's hydrology would continue to be dominated by the Klamath Basin's natural hydrologic character and upstream management of flow volumes from Upper Klamath Lake and releases from Iron Gate dam. The Klamath River total maximum daily load (TMDL) in California (NCRWQCB 2010) includes water temperature, dissolved oxygen, and nutrient-related numeric targets and waste load allocations for the hatchery as well as other Klamath River sources. With implementation of measures as required by NCRWQCB (2010) to achieve these water quality targets it is expected that hatchery operations under the proposed

action will not contribute to any significant adverse cumulative impacts to water quality in the Klamath River.

The proposed action alternative is not likely to impact identified historic or cultural resources. As such, the proposed action would not contribute to any significant cumulative impacts to these resources. Under both the no action and the proposed action alternatives, no significant effects on land ownership and land use are expected. No activities would occur under either alternative that would result in changes in the current patterns of land ownership and land use in the IGH area.

Climate change poses a high threat to salmonids within the area, particularly coho salmon. Rearing and migratory habitat are most at risk to climate change. Increasing water temperatures and changes in the amount and timing of precipitation and snowmelt will impact water quality and hydrologic function in the summer and winter. No activities would occur under the proposed action that would result in changes to greenhouse gas emissions or other pollutants that are likely to significantly contribute to environmental conditions associated with climate change.

NMFS expects that impacts from the proposed action, in combination with other ongoing and planned actions in the action area, will be beneficial to the human environment as compared to the No-action Alternative.

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**DETERMINATION**

In view of the information presented in this document, the analysis contained in the supporting Final Environmental Assessment (NMFS 2012) it is hereby determined that the issuance of a Section 10(a)(1)(A) permit to CDFW and PacifiCorp and implementation of the HGMP will not significantly impact the quality of the human environment as described above and in the Final Environmental Assessment. In addition, all beneficial and adverse impacts of the proposed action have been addressed to reach the conclusion of no significant impacts. Accordingly, preparation of an EIS for this action is not necessary.

William Stelle

10/31/14

Regional Administrator, West Coast Region, NMFS

Date

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