UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

Refer to NMFS No:
2011/05745

September 21, 2012

Kevin Moynahan
Chief, Regulatory Branch
Portland District, U.S. Army Corps of Engineers
P.O. Box 2946
Portland, Oregon 97208-2946

Re: Endangered Species Act Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the Higdon Tide Gate Replacement, Little Nestucca River (6th Field HUC 171002030103), Tillamook County, Oregon (Corps No.: NWP-2011-447)

Dear Mr. Moynahan:

The enclosed document contains a biological opinion (opinion) prepared by the National Marine Fisheries Service (NMFS) pursuant to section 7(a)(2) of the Endangered Species Act (ESA) on the effects of the proposal by the U.S. Army Corps of Engineers (Corps) to authorize Mr. Lloyd Higdon's tide gate replacement on the Little Nestucca River under the authorities found in section 10 of the Rivers and Harbors Act and section 404 of the Clean Water Act. In this opinion, we conclude that the proposed action is not likely to adversely affect the southern distinct population segment of North American green sturgeon (*Acipenser medirostris*) and the south distinct population segment of Pacific eulachon (*Thaleichthys pacificus*). We also conclude that the proposed action is not likely to jeopardize the continued existence of Oregon Coast (OC) coho salmon (*Oncorhynchus kisutch*) or result in the destruction or adverse modification of their designated critical habitat.

As required by section 7 of the ESA, NMFS is providing an incidental take statement with the opinion. The incidental take statement describes reasonable and prudent measures NMFS considers necessary or appropriate to minimize the impact of incidental take associated with this action. The take statement sets forth nondiscretionary terms and conditions, including reporting requirements, that the Federal action agency must comply with to carry out the reasonable and prudent measures. Incidental take from actions that meet these terms and conditions will be exempt from the ESA's prohibition against the take of listed species.

This document also includes the results of our analysis of the action's likely effects on essential fish habitat (EFH) pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA), and includes three conservation recommendations to avoid, minimize, or otherwise offset potential adverse effects on EFH.

Two of these conservation recommendations are a subset of the ESA take statement's terms and conditions. Section 305(b) (4) (B) of the MSA requires Federal agencies to provide a detailed written response to NMFS within 30 days after receiving these recommendations.

If the response is inconsistent with the EFH conservation recommendations, the Federal action agency must explain why the recommendations will not be followed, including the scientific justification for any disagreements over the effects of the action and the recommendations. In response to increased oversight of overall EFH program effectiveness by the Office of Management and Budget, NMFS established a quarterly reporting requirement to determine how many conservation recommendations are provided as part of each EFH consultation and how many are adopted by the action agency. Therefore, we request that in your statutory reply to the EFH portion of this consultation, you clearly identify the number of conservation recommendations accepted.

Please direct questions regarding this opinion to Annie Birnie, fishery biologist in the Oregon Coast Branch of the Oregon State Habitat Office, at 503.230.5407.

Sincerely,

for William W. Stelle, Jr.
Regional Administrator

cc: Leo Kuntz, Nehalem Marine Mfg.
Karen Nelson, Corps
Dave Stewart, ODFW

Endangered Species Act Biological Opinion
and
Magnuson-Stevens Fishery Conservation and Management Act
Essential Fish Habitat Response
for the

Higdon Tide Gate Replacement
Little Nestucca River (6th Field HUC 171002030103)
Tillamook County, Oregon
(Corps No.: NWP-2011-447)

NMFS Consultation Number: 2011/05745

Federal Action Agency: U.S. Army Corps of Engineers

Affected Species and Determinations:

ESA-Listed Species	ESA Status	Is the action likely to adversely affect this species or its critical habitat?	Is the Action likely to jeopardize this species?	Is the action likely to destroy or adversely modify critical habitat for this species?
Oregon Coast coho salmon	T	Yes	No	No
North American green sturgeon	T	No	No	No
Pacific eulachon	T	No	No	No

Fishery Management Plan that Describes EFH in the Action Area	Would the action adversely affect EFH?	Are EFH conservation recommendations provided?
Pacific Coast Salmon	Yes	Yes
Pacific Coast Groundfish	Yes	Yes
Coastal Pelagic Species	Yes	Yes

Consultation Conducted By: National Marine Fisheries Service
Northwest Region

Issued By:

for William W. Stelle, Jr.
Regional Administrator

Date: September 21, 2012

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1. INTRODUCTION

This Introduction Section provides information relevant to the other sections of this document and is incorporated by reference into Sections 2 and 3 below.

1.1 Background

The National Marine Fisheries Service (NMFS) prepared the biological opinion (opinion) and incidental take statement portions of this document in accordance with section 7(b) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531, *et seq*.), and implementing regulations at 50 CFR 402.

We also completed an essential fish habitat (EFH) consultation on the proposed action, in accordance with section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 U.S.C. 1801, *et seq*.) and implementing regulations at 50 CFR 600.

The opinion, incidental take statement, and EFH conservation recommendations are each in compliance with the Data Quality Act (44 U.S.C. 3504(d)(1) *et seq*.) and they underwent pre-dissemination review.

1.2 Consultation History

On November 21, 2011, NMFS received a letter from the U.S. Army Corps of Engineers (Corps) requesting informal consultation pursuant to the ESA, and EFH consultation as required under the MSA, for the issuance of a permit under section 10 of the Rivers and Harbors Act and section 404 of the Clean Water Act to Mr. Lloyd Higdon to replace a tide gate along the Little Nestucca River. The Corps concluded that the proposed action is not likely to adversely affect (NLAA) Oregon Coast (OC) coho salmon (*Oncorhynchus kisutch*) or their designated critical habitat.

Following a review of the proposed action which included an Oregon Department of Fish and Wildlife (ODFW) visual habitat assessment and NMFS fish passage review, tide gate design concerns were shared with the Corps, the applicant and the project contractor. The NMFS sent a non-concurrence letter and request for additional information to the Corps on December 28, 2011. Information in response to this letter was received by NMFS from the contractor via email on January 6, 2012. The NMFS still did not concur with an NLAA determination for the proposed action for the following reasons: (1) The tide gate design did not meet NMFS' fish passage approval, (2) the amount of fill from the repair of the adjacent berm, and (3) the extension of the culvert towards the river, and sent an additional non-concurrence letter to the Corps on January 12, 2012, giving notice that an opinion was in preparation for the proposed project. On February 1, 2012, the NMFS received a request from the Corps for formal consultation under section 7 of the ESA and consultation for adverse impacts to EFH as required under MSA.

A complete record of this consultation is on file at the Oregon State Habitat Office in Portland, Oregon.

1.3 Proposed Action

"Action" means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration.

The biological assessment (BA) included the following proposed action:

> The proposed action is to replace an existing 42-inch diameter by 67-foot long culvert and a 42-inch diameter failing waterman cast iron top-hinge tide gate to restore fish passage and water conveyance in a drainage system primarily used for agriculture (dairy forage) that also supports high protein feed for rare Aleutian Geese. Culvert would be extended 20-feet, back to its original configuration of 87-feet. The existing culvert was shortened after an emergency repair 15-20 years ago. Flow would then discharge at the river with no exterior channel. Currently an exterior channel approximately 20 feet in length exists between the culvert and river. This channel contributes to a siltation problem. The applicant consulted with ODFW and selected a 48-inch diameter aluminum side hinge tide gate to replace the existing tide gate. The project area is within an Exclusive Farm Use (EFU) area, with linear ditches and an unnamed tributary that connects to the culvert and tide gate.
>
> Granular base-rock (30 cubic yards) would provide culvert bedding material, and 40 cubic yards of riprap would be placed at inlet and outlet, with an additional 20 cubic yards of granual back-fill to replace levee. The bulk of the back-fill would consist of suitable native material from the excavation. Material deemed unacceptable for back-fill would be removed to an upland location. The project would be performed within the in-water-work window and at low tides. Best Management Practices include:
>
> 1. All work within the active channel will be completed in accordance with the Oregon Guidelines for timing of in-water work (July 1 – September 15) to protect fish and wildlife resources, and during low tides.
> 2. Heavy equipment and stationary equipment will be properly maintained and inspected daily to prevent leaks and spills from entering the water.
> 3. Acceptable native materials displaced by construction, including woody material, vegetation, topsoil and channel materials (gravel, cobble and boulders), would be conserved for restoration.
> 4. Site restoration will be implemented within two weeks after discharge of fill material in waters of the United States, and with an 80% cover of native vegetation by the end of year three and thereafter.
> 5. Fish passage functions will be maintained throughout the life of the structure.

The above proposed action was taken directly from the BA.
This tide gate and its operation by the landowner will continue to be a barrier to fish passage during the time it is closed, preventing free OC coho salmon migration, deteriorating the quality and connectivity of their habitats, and injuring or killing juvenile OC coho salmon caught

upstream of the levee when the tide gate is closed. The repairs to the levee will not extend its useful life. The future operation of this tide gate is interdependent upon the proposed action.

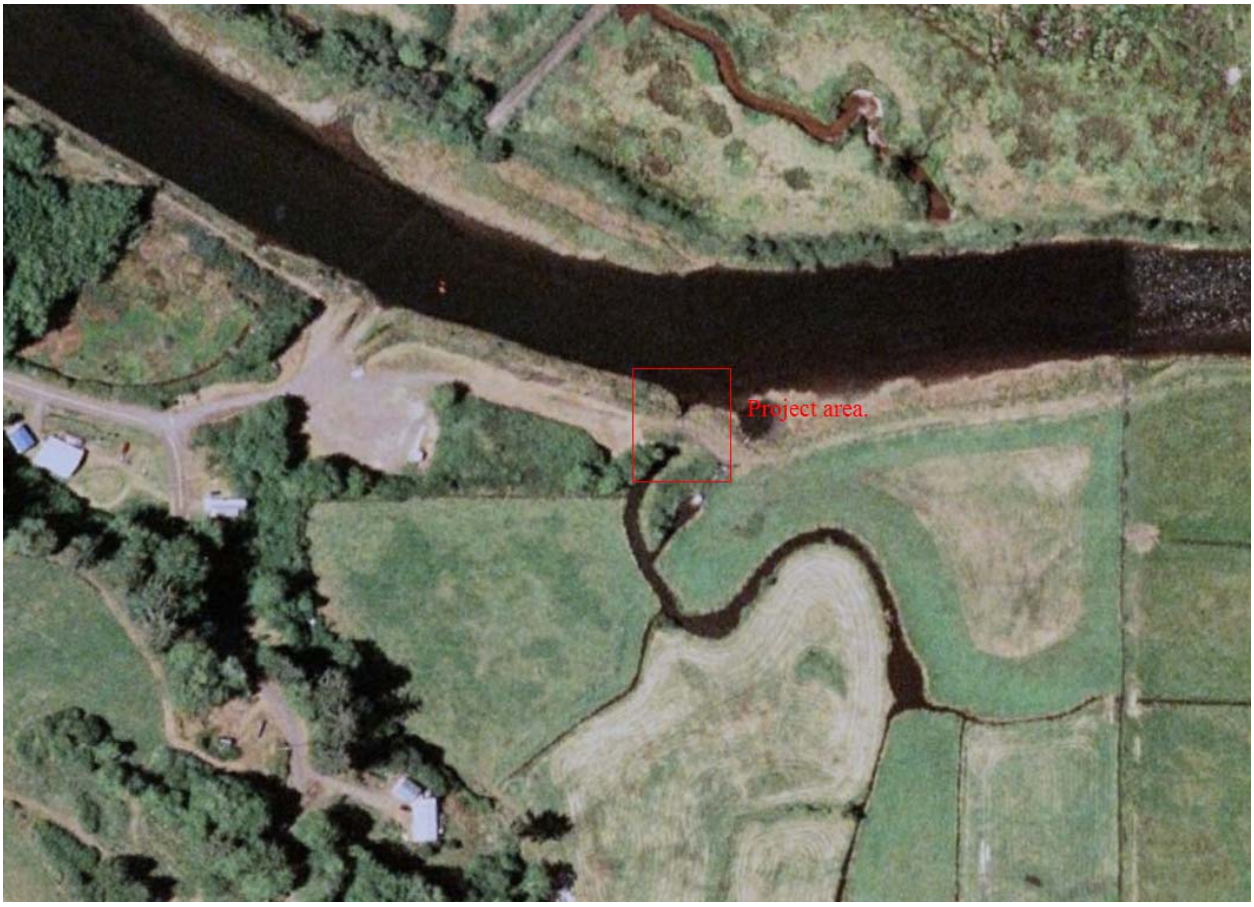

Figure 1. Project area at river mile 0.75 of the Little Nestucca River.

1.4 Action Area

The project is located in the Little Nestucca River, river mile 0.75, approximately 1,500 feet upstream from the southeast corner of the Highway 101 bridge that crosses the river, 4.3 miles south of the city of Cloverdale, Tillamook County, Oregon (6th field HUC 171002030103). "Action area" means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02). Thus, the action area is defined as the EFU area (50 acres) and tributary behind the tide gate, and 500 feet downstream and 100 feet upstream (during high tide) from the tide gate on the Little Nestucca River (the extent that suspended sediment will travel from fill/construction activities).

Three ESA-listed species (Table 1) are reasonably likely to occur in the action area:

- OC coho salmon

- Southern distinct population segment North American green sturgeon (*Acipenser medirostris*) (hereafter referred to as 'green sturgeon')
- Southern distinct population segment Pacific eulachon (*Thaleichthys pacificus*) (hereafter referred to as 'eulachon')

Adult OC coho salmon use the action area as a migratory corridor and staging area as they move upstream to spawning habitat in Little Nestucca River's tributaries. Juvenile OC coho salmon begin their outmigration from their natal streams to the ocean in late winter and use the Little Nestucca for rearing and refuge. According to ODFW,[1] a visual habitat survey approximately one-half mile upstream of the culvert on the unnamed tributary showed suitable spawning and rearing habitat for a variety of salmon and steelhead, though no OC coho salmon juvenile presence was recorded. More detailed information on OC coho salmon use of the action area follows in Section 2. The action area is designated critical habitat for OC coho salmon.

NMFS defined two distinct population segments of green sturgeon: a northern distinct population segment with spawning populations in the Klamath and Rogue rivers and a southern that spawns in the Sacramento River. The southern green sturgeon was listed as threatened in 2006 (Table 1), and includes all spawning populations south of the Eel River in California.

Critical habitat for green sturgeon was not designated in the action area, though it occurs in the marine coastal zone approximately 3.8 miles downstream from the action area (Table 1). Green sturgeon may occur off the Nestucca Bay in marine waters during the in-water work period of July 1 to September 15 (Lindley *et al*. 2008). Furthermore, green sturgeon are known to congregate in coastal waters and estuaries, including non-natal estuaries. Presumably they enter these estuaries in summer to feed (Beamis and Kynard 1997). Data from studies in Washington indicate that green sturgeon are present in estuaries from June until October (Moser and Lindley 2007). We do not expect adult or sub-adult green sturgeon from the ESA-listed population segment to be present upstream in the action area during the in-water construction period of July 1 – September 15. However, given that this timing does coincide with possible green sturgeon presence in estuaries, it is possible that green sturgeon may be present during project construction.

[1] Email from Dave Stewart, ODFW fish biologist, to Annie Birnie, NMFS, December 5, 2011.

Table 1. Federal Register notices for final rules that list threatened and endangered species, designate critical habitats, or apply protective regulations to listed species considered in this consultation. Listing status: "T" means listed as threatened under the ESA.

Species	Listing Status	Critical Habitat	Protective Regulations
Marine and Anadromous Fish			
Coho salmon (*Oncorhynchus kisutch*)			
Oregon Coast	T 2/11/08; 73 FR 7816	2/11/08; 73 FR 7816	2/11/08; 73 FR 7816
North American Green sturgeon (*Acipenser medirostris*)			
Southern	T 4/07/06; 71 FR 17757	10/09/09; 74 FR 52300	6/02/10; 75 FR 30714
Pacific Eulachon (*Thaleichthys pacificus*)			
Eulachon	T 3/18/10; 75 FR 13012	10/20/11; 76 FR 65324	Not applicable

The southern DPS of eulachon range from the Mad River in northern California to the Skeena River in British Columbia, Canada. They inhabit several riverine and estuarine systems along the Pacific west coast of North America and population sizes vary between these systems. Typically, eulachon adults return to freshwater from January to March and evidence suggests that adult eulachon may return as early as November or December to spawn (Ellis and DeKrey 2011, Gustafson *et al*. 2010, WDFW and ODFW 2001). There is no known observation of eulachon in the lower Little Nestucca River or Nestucca Bay (Monaco *et al*. 1990, Gustafson *et al*. 2010). However, there has not been a focused effort to determine presence either. Eulachon presence is known to be very sporadic in some areas (*e.g.*, Sandy River) so long-term sampling during the winter is necessary to achieve definitive results for areas that are not frequently used. The habitat in the Nestucca Bay and its associated riverine tributaries are similar to other areas known to support eulachon spawning populations. Therefore, in the absence of sufficient eulachon surveys in the lower Little Nestucca River and the Nestucca Bay and given the presence of suitable habitat, we find that it is possible, though unlikely, that presence may occur during the proposed action. Critical habitat was not designated in the Little Nestucca River or Nestucca Bay and protective regulations have not been proposed for eulachon (Table 1).

The action area has also been identified by the Pacific Fishery Management Council (PFMC) as EFH for groundfish (PFMC 2005), coastal pelagic species (PFMC 1998), and Pacific salmon (PFMC 1999). The action area is within the estuarine area of the Little Nestucca River, which is designated as Habitat Areas of Particular Concern (HAPCs).

2. ENDANGERED SPECIES ACT: BIOLOGICAL OPINION AND INCIDENTAL TAKE STATEMENT

The ESA establishes a national program for conserving threatened and endangered species of fish, wildlife, plants, and the habitat upon which they depend. Section 7(a)(2) of the ESA requires Federal agencies to consult with the United States Fish and Wildlife Service, NMFS, or both, to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or adversely modify or destroy their designated critical habitat. Section 7(b)(3) requires that at the conclusion of consultation, the Service provide an opinion

stating how the agencies' actions will affect listed species and their critical habitat. If incidental take is expected, section 7(b)(4) requires the consulting agency to provide an incidental take statement (ITS) that specifies the impact of any incidental taking and includes reasonable and prudent measures to minimize such impacts.

2.1 Approach to the Analysis

Section 7(a)(2) of the ESA requires Federal agencies, in consultation with NMFS, to insure that their actions are not likely to jeopardize the continued existence of endangered or threatened species, or adversely modify or destroy their designated critical habitat. The jeopardy analysis considers both survival and recovery of the species. The adverse modification analysis considers the impacts on the conservation value of designated critical habitat.

"To jeopardize the continued existence of a listed species" means to engage in an action that would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR 402.02).

This opinion does not rely on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 CFR 402.02. Instead, we have relied upon the statutory provisions of the ESA to complete the following analysis with respect to critical habitat.[2]

We will use the following approach to determine whether the proposed action is likely to jeopardize listed species or destroy or adversely modify critical habitat:

- Identify the rangewide status of the species and critical habitat likely to be adversely affected by the proposed action.
- Describe the environmental baseline in the action area.
- Analyze the effects of the proposed action on both species and their habitat.
- Describe any cumulative effects in the action area.
- Integrate and synthesize the above factors to assess the risk that the proposed action poses to species and critical habitat.
- Reach jeopardy and adverse modification conclusions.
- If necessary, define a reasonable and prudent alternative to the proposed action.

In this opinion, we conclude that the proposed action is not likely to adversely affect (NLAA) green sturgeon and eulachon; or their designated critical habitats. These species are discussed in Section 2.11 of the opinion under NLAA species.

2.2 Rangewide Status of the Species and Critical Habitat

This opinion examines the status of each species that would be affected by the proposed action.

[2] Memorandum from William T. Hogarth to Regional Administrators, Office of Protected Resources, NMFS (Application of the "Destruction or Adverse Modification" Standard Under Section 7(a)(2) of the Endangered Species Act) (November 7, 2005).

The status is the level of risk that the listed species face, based on parameters considered in documents such as recovery plans, status reviews, and listing decisions. The species status section helps to inform the description of the species' current "reproduction, numbers, or distribution" as described in 50 CFR 402.02. The opinion also examines the condition of critical habitat throughout the designated area, evaluates the conservation value of the various watersheds and coastal and marine environments that make up the designated area, and discusses the current function of the essential physical and biological features that help to form that conservation value.

One factor affecting the status of salmonid fishes and aquatic habitat at large is climate change. Climate change is likely to play an increasingly important role in determining the abundance of ESA-listed species, and the conservation value of designated critical habitats, in the Pacific Northwest. These changes will not be spatially homogeneous across the Pacific Northwest. Areas with elevations high enough to maintain temperatures well below freezing for most of the winter and early spring would be less affected. Low-lying areas that historically have received scant precipitation contribute little to total streamflow and are likely to be more affected.

During the last century, average regional air temperatures increased by 1.5°F, and increased up to 4°F in some areas (USGCRP 2009). Warming is likely to continue during the next century as average temperatures increase another 3 to 10°F (USGCRP 2009). Overall, about one-third of the current cold-water fish habitat in the Pacific Northwest is likely to exceed key water temperature thresholds by the end of this century (USGCRP 2009).

Precipitation trends during the next century are less certain than for temperature, but more precipitation is likely to occur during October through March and less during summer months, and more of the winter precipitation is likely to fall as rain rather than snow (ISAB 2007, USGCRP 2009). Where snow occurs, a warmer climate will cause earlier runoff so stream flows in late spring, summer, and fall will be lower and water temperatures will be warmer (ISAB 2007, USGCRP 2009).

Higher winter stream flows increase the risk that winter floods in sensitive watersheds will damage spawning redds and wash away incubating eggs (USGCRP 2009). Earlier peak stream flows will also flush some young salmon and steelhead from rivers to estuaries before they are physically mature, increasing stress and the risk of predation (USGCRP 2009). Lower stream flows and warmer water temperatures during summer will degrade summer rearing conditions, in part by increasing the prevalence and virulence of fish diseases and parasites (USGCRP 2009). Other adverse effects are likely to include altered migration patterns, accelerated embryo development, premature emergence of fry, variation in quality and quantity of tributary rearing habitat, and increased competition and predation risk from warm-water, non-native species (ISAB 2007).

The earth's oceans are also warming, with considerable inter-annual and inter-decadal variability superimposed on the longer-term trend (Bindoff *et al*. 2007). Historically, warm periods in the coastal Pacific Ocean have coincided with relatively low abundances of salmon and steelhead, while cooler ocean periods have coincided with relatively high abundances (Scheuerell and

Williams 2005, Zabel *et al*. 2006, USGCRP 2009). Ocean conditions adverse to salmon and steelhead may be more likely under a warming climate (Zabel *et al*. 2006).

2.2.1 Status of Listed Species

For Pacific salmon and steelhead, NMFS commonly uses four parameters to assess the viability of the populations that, together, constitute the species: spatial structure, diversity, abundance, and productivity (McElhany *et al.* 2000). These "viable salmonid population" (VSP) criteria therefore encompass the species' "reproduction, numbers, or distribution" as described in 50 CFR 402.02. When these parameters are collectively at appropriate levels, they maintain a population's capacity to adapt to various environmental conditions and allow it to sustain itself in the natural environment. These attributes are influenced by survival, behavior, and experiences throughout a species' entire life cycle, and these characteristics, in turn, are influenced by habitat and other environmental conditions.

"Spatial structure" refers both to the spatial distributions of individuals in the population and the processes that generate that distribution. A population's spatial structure depends fundamentally on habitat quality and spatial configuration and the dynamics and dispersal characteristics of individuals in the population.

"Diversity" refers to the distribution of traits within and among populations. These range in scale from deoxyribonucleic acid (DNA) sequence variation at single genes to complex life history traits (McElhany *et al*. 2000).

"Abundance" generally refers to the number of naturally-produced adults (*i.e*., the progeny of naturally-spawning parents) in the natural environment (*e.g*., on spawning grounds).

"Productivity," as applied to viability factors, refers to the entire life cycle; *i.e*., the number of naturally-spawning adults produced per parent. When progeny replace or exceed the number of parents, a population is stable or increasing. When progeny fail to replace the number of parents, the population is declining. McElhany *et al*. (2000) use the terms "population growth rate" and "productivity" interchangeably when referring to production over the entire life cycle. They also refer to "trend in abundance," which is the manifestation of long-term population growth rate.

For species with multiple populations, once the biological status of a species' populations has been determined, NMFS assesses the status of the entire species using criteria for groups of populations, as described in recovery plans and guidance documents from technical recovery teams. Considerations for species viability include having multiple populations that are viable, ensuring that populations with unique life histories and phenotypes are viable, and that some viable populations are both widespread to avoid concurrent extinctions from mass catastrophes and spatially close to allow functioning as metapopulations (McElhany *et al*. 2000).

OC Coho Salmon. This species includes all naturally-spawned populations of OC coho salmon in Oregon coastal streams south of the Columbia River and north of Cape Blanco, including the South Umpqua population, which includes the Cow Creek stock #37 of ODFW's OC coho salmon hatchery program. OC coho salmon were first listed in February 2008. As part

of a legal settlement agreement in 2008, we completed a new status review for the species. In 2011, we issued a final rule re-promulgating the threatened listing for OC coho salmon (USDC 2011).

The Oregon Coast Technical Recovery Team (TRT) identified 56 populations — 21 independent and 35 dependent (Table 2). The dependent populations are reliant on strays from other populations to maintain them over long time periods. The TRT also identified five biogeographic strata (Table 2) (Lawson *et al.* 2007).

Table 2. OC coho salmon populations. Dependent populations (D) are populations that historically would not have had a high likelihood of persisting in isolation for 100 years. These populations relied upon periodic immigration from other populations to maintain their abundance. Independent populations are populations that historically would have had a high likelihood of persisting in isolation from neighboring populations for 100 years and are rated as functionally independent (FI) and potentially independent (PI) (McElhany *et al.* 2000, Lawson *et al.* 2007).

Stratum	Population	Type
North Coast	Necanicum	PI
	Ecola	D
	Arch Cape	D
	Short Sands	D
	Nehalem	FI
	Spring	D
	Watseco	D
	Tillamook	FI
	Netarts	D
	Rover	D
	Sand	D
	Nestucca	FI
	Neskowin	D
Mid-Coast	Salmon	PI
	Devils	D
	Siletz	FI
	Schoolhouse	D
	Fogarty	D
	Depoe	D
	Rocky	D
	Spencer	D
	Wade	D
	Coal	D
	Moolack	D
	Big (Yaquina)	D
	Yaquina	FI
	Theil	D
	Beaver	PI
Mid-Coast (cont.)	Alsea	FI
	Big (Alsea)	D
	Vingie	D
	Yachats	D
	Cummins	D
	Bob	D
	Tenmile	D
	Rock	D
	Big (Siuslaw)	D
	China	D
	Cape	D
	Berry	D
	Sutton	D
Lakes	Siuslaw	FI
	Siltcoos	PI
	Tahkenitch	PI
	Tenmile	PI
Umpqua	Lower Umpqua	FI
	Middle Umpqua	FI
	North Umpqua	FI
	South Umpqua	FI
Mid-South Coast	Threemile	D
	Coos	FI
	Coquille	FI
	Johnson	D
	Twomile	D
	Floras	PI
	Sixes	PI

Wainwright *et al.* (2008) determined that the weakest strata of OC coho salmon were in the North Coast and Mid-Coast of Oregon, which had only "low" certainty of being persistent. The

strongest strata were the Lakes and Mid-South Coast, which had "high" certainty of being persistent. To increase certainty that OC coho salmon as a whole is persistent, they recommended that restoration work should focus on those populations with low persistence, particularly those in the North Coast, Mid-Coast, and Umpqua strata.

A 2010 biological review team (BRT) (Stout *et al.* 2011) noted significant improvement in hatchery and harvest practices. However, harvest and hatchery reductions have changed the population dynamics of OC coho salmon. It has not been demonstrated that productivity during periods of poor marine survival is now adequate to sustain the species. Recent increases in adult escapement do not provide strong evidence that the century-long downward trend has changed. The ability of the OC coho salmon to survive another prolonged period of poor marine survival remains in question.

Current concerns for spatial structure focus on the Umpqua River. Of the four populations in the Umpqua stratum, two, the North Umpqua and South Umpqua, were of particular concern. The North Umpqua is controlled by Winchester Dam and has historically been dominated by hatchery fish. Hatchery influence has recently been reduced, but the natural productivity of this population remains to be demonstrated. The South Umpqua is a large, warm system with degraded habitat. Spawner distribution appears to be seriously restricted in this population, and it is probably the most vulnerable of any OC coho salmon population to increased temperatures (Stout *et al.* 2011).

Current status of diversity shows improvement through the waning effects of hatchery fish on populations of OC coho salmon. In addition, recent efforts in several coastal estuaries to restore lost wetlands should be beneficial to this species' diversity through the increase in available habitat. However, diversity is lower than it was historically because of the loss of both freshwater and tidal habitats coupled with the restriction of diversity from very low returns over the past 20 years.

The BRT concluded that there is a moderate certainty of OC coho salmon persistence over the next 100 years and a low-to-moderate certainty that the species is sustainable for the foreseeable future, assuming no future trends in factors affecting the species. We issued a final determination to retain the ESA listing status, effective June 20, 2011. Thus, the February 2008 critical habitat designation and 4(d) regulations remain in effect (USDC 2011).

Limiting factors and threats to OC coho salmon include (Stout *et al.* 2011, NOAA Fisheries 2011):

- Degraded freshwater habitat: Floodplain connectivity and function, channel structure and complexity, riparian areas and large wood supply, stream substrate, stream flow, and water quality have been degraded as a result of cumulative impacts of agriculture, forestry, instream mining, dams, road crossings, dikes, levees, etc.
- Fish passage barriers that limit access to spawning and rearing habitats.
- Adverse climate, altered past ocean/marine productivity, and current ocean ecosystem conditions have favored competitors and predators and reduced salmon survival rates in freshwater rivers and lakes, estuaries, and marine environments.

Nestucca Population. OC coho salmon occurring in the action area are part of the Nestucca population, which is identified as a functionally-independent population in the North Coast biogeographic strata (Lawson *et al.* 2007). The population includes OC coho salmon inhabiting all basins that drain directly into the Nestucca Bay (Nestucca and Little Nestucca Rivers, and other tributaries).

Annual spawning surveys indicate population abundance varies considerably from year to year. Since 1996, the population has constituted from .05-6.6% of the species' total spawner abundance. The recent trend in this population's abundance is not necessarily consistent with the total OC coho salmon abundance trend (Table 3), and numbers have varied considerably. The condition of freshwater habitat continues to limit the Nestucca population production, especially the loss of winter habitat and stream complexity. This type of habitat is important to juvenile OC coho salmon looking for refuge during large floods.

Table 3. Annual estimates of OC coho salmon natural spawner abundance in the Nestucca population and the entire species.

Natural Spawner Abundance			
	Nestucca Population		OC Coho Evolutionary Significant Unit
Year	**Number**	**%**	**Species***
1996	440	0.5%	81022
1997	230	1.0%	23661
1998	202	0.6%	32475
1999	2357	5.0%	47042
2000	1219	1.7%	73691
2001	4164	2.6%	161818
2002	16698	6.6%	253094
2003	10194	4.5%	227557
2004	4695	2.7%	172778
2005	686	0.4%	154595
2006	1876	1.5%	128819
2007	394	0.6%	66271
2008	1844	1.0%	179686
2009	4252	1.6%	262735
2010	1947	0.7%	283478
Average	**3413**		

*Source: http://oregonstate.edu/dept/ODFW/spawn/pdf%20files/coho/AnnualEstESU1996-2010.pdf

2.2.2 Status of Critical Habitat

We review the status of designated critical habitat affected by the proposed action by examining the condition and trends of essential physical and biological features throughout the designated area. These features are essential to the conservation of the listed species because they support one or more of the species' life stages (*e.g*., sites with conditions that support spawning, rearing, migration and foraging).

OC Coho Salmon. In 2008, we designated critical habitat for OC coho salmon. The status of critical habitat was evaluated based on a watershed-level analysis of conservation value that focused on the physical features (*i.e.*, the primary constituent elements (PCEs)) that are essential to their conservation. A Critical Habitat Analytical Review Team (CHART) consisting of Federal fishery biologists and habitat specialists analyzed the conservation value of 80 watersheds within the range of OC coho salmon (NOAA Fisheries 2007).

Each watershed was ranked using a conservation value attributed to the quantity of habitat with PCEs, the present condition of those PCEs, the likelihood of achieving PCE potential (either naturally or through active restoration), support for rare or important genetic or life history characteristics, support for abundant populations, and support for spawning and rearing populations. In some cases, our understanding of these interim conservation values has been further refined by the work of the TRTs and other recovery planning efforts that have better explained the habitat attributes, ecological interactions, and population characteristics important to each species.

Climate change, as described in Section 2.2, is likely to reduce the conservation value of designated critical habitats in the Pacific Northwest. Other influences on the conservation value of critical habitat in the Oregon Coast recovery domain are discussed below.

The historical disturbance regime in the central Oregon Coast Range was dominated by a mixture of high and low-severity fires, with a natural rotation of approximately 271 years. Old-growth forest coverage in the Oregon Coast Range varied from 25% to 75% during the past 3,000 years, with a mean of 47%, and never fell below 5% (Wimberly *et al.* 2000). Currently, the Coast Range has approximately 5% old-growth, almost all of it on Federal lands. The dominant disturbance now is logging on a cycle of approximately 30 to 100 years, with fires suppressed.

In 2005, the State of Oregon (2005) completed an assessment of habitat conditions in the range of OC coho salmon. The assessment mapped how streams with high intrinsic potential for OC coho salmon rearing are distributed by land ownership categories. Agricultural lands and private industrial forests have by far the highest percentage of land ownership in high intrinsic potential areas and along all OC coho salmon stream miles. Federal lands have only about 20% of OC coho salmon stream miles and 10% of high intrinsic potential stream reaches. Because of this distribution, activities in lowland agricultural areas are particularly important to the conservation of OC coho salmon.

The OC coho salmon assessment concluded that at the evolutionary significant unit-scale, pools are generally abundant, although slow-water and off-channel habitat (which are important

refugia for OC coho salmon during high winter flows) are limited in the majority of streams when compared to reference streams in minimally-disturbed areas. Amounts of large wood in streams are low in all monitoring areas and land-use types relative to reference conditions. Amounts of fine sediment are high in 75% of the monitoring areas, and were comparable to reference conditions only on public lands. Approximately 62% to 91% of tidal wetland acres (depending on estimation procedures) have been lost for functionally and potentially independent populations of OC coho salmon.

As part of the coastal OC coho salmon assessment, the Oregon Department of Environmental Quality analyzed the status and trends of water quality in the range of OC coho salmon using the Oregon water quality index. Using the index at the species scale, 42% of monitored sites had excellent to good water quality, and 29% show poor to very poor water quality. Within the four monitoring areas, the North Coast had the best overall conditions, and the Mid-South coast had the poorest conditions. For the period between 1992 and 2002, no sites showed a declining trend in water quality. The area with the most improving trends was the North Coast, where 66% of the sites had a significant improvement in index scores. The Umpqua River basin had the lowest number of improving sites with 11% showing improvement.

Little Nestucca. The Little Nestucca River watershed (HUC 1710020301) is the only affected watershed. The CHART identified agriculture, forestry and urbanization as key management activities affecting the PCEs within this watershed. More specifically, the landscape changes are largely from: diking, filling, and draining (related to grazing and agriculture), sedimentation (related to forestry, grazing, agriculture, and urbanization), estuary dredging (to support ocean traffic), loss of large woody debris and forest land cover, and stream channelization. The CHART considered this watershed as having medium conservation value. The conservation role of this critical habitat unit is to provide freshwater habitat capable of supporting a viable population of OC coho salmon and estuarine areas that support successful migration and transition from fresh to salt water and vice versa.

Table 4. PCEs of critical habitats designated for ESA-listed OC coho salmon considered in the Opinion, and corresponding species life history events.

Primary Constituent Elements		Species Life History Event
Site Type	**Site Attribute**	
Freshwater rearing	Floodplain connectivity Forage Natural cover Water quality Water quantity	Fry emergence from gravel Fry/parr/smolt growth and development
Freshwater migration	Free of artificial obstruction Natural cover Water quality Water quantity	Adult sexual maturation Adult upstream migration and holding Kelt (steelhead) seaward migration Fry/parr/smolt growth, development, and seaward migration
Estuarine areas	Forage Free of artificial obstruction Natural cover Salinity Water quality Water quantity	Adult sexual maturation and "reverse smoltification" Adult upstream migration and holding Kelt (steelhead) seaward migration Fry/parr/smolt growth, development, and seaward migration

2.3 Environmental Baseline

The "environmental baseline" includes the past and present impacts of all Federal, state, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of state or private actions which are contemporaneous with the consultation in process (50 CFR 402.02).

The action area is at river mile 0.75, approximately 1,500 feet upstream from the southeast corner of the Highway 101 bridge that crosses the river. The project site is located on an unnamed tributary to the Little Nestucca River, and the EFU area behind the tide gate has grass and legume forage to support dairy cows. A visual habitat survey approximately one-half mile upstream of the tide gate culvert on the unnamed tributary showed suitable spawning and rearing habitat for a variety of salmon and steelhead, though downstream of that the tributary is channelized through the agricultural lands, lacking roughness and appropriate habitat.

The action area is located in the Little Nestucca River, which flows 18 miles from its headwaters to Nestucca Bay. It enters Nestucca Bay at the south end independently of the Nestucca River. Habitat conditions in the Little Nestucca watershed reflect past and present disturbance, both natural and human-induced. Natural disturbances include earthquakes, tsunamis, floods, and forest fires. Human-induced disturbance include diking, filling, agriculture, dredging, logging, and urban and transportation associated development.

Urban, rural residential, and agriculture uses are impacting the Little Nestucca and its tributaries, including in the action area. This lower reach of the Little Nestucca River channel is simplified and largely disconnected from its floodplain by dikes and levees. Riparian vegetation is limited by land use and dike maintenance practices. Wetlands have been converted from estuarine to freshwater due to dikes and tide gates, and tidal exchange is impaired by tide gates that restrict estuarine waters from flooding what were tidal wetlands.

The existing tide gate was shortened after an emergency fix 15-20 years ago, resulting in the levee erosion and a silt-laden, 20-foot channel that extends from the tide gate outfall to the river. This erosion is evident in the aerial photo (Figure 1). Due to the current condition of the iron top-hinged tide gate in the action area, fish passage in the action area is extremely limited to a short window of time when the ebb tide can push the tide gate open, closing abruptly as the tide changes. This closure has resulted in limited access for fish upstream of the tide gate, as well as increased temperatures and water nutrient concentrations in the unnamed tributary because of poor water flushing through the culvert and tide gate. Behind the tide gate, the average summer interior water level is 2.42 feet NAVD88 (North American Vertical Datum of 1988), and the average winter water level is 4.54 feet NAVD88. According to the applicant, these levels will remain the same with the new tide gate replacement.

The Little Nestucca River is listed on the Oregon Department of Environmental Quality 303(d) list for water quality limited streams for fecal coliform (ODEQ 2010), largely associated with the floodplain use by dairy cows.

2.4 Effects of the Action on Species and Designated Critical Habitat

"Effects of the action" means the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline (50 CFR 402.02). Indirect effects are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur.

Effects on Habitat.

Granual base-rock (30 cubic yards) would provide culvert bedding material and back fill to replace the levee (20 cubic yards), and 40 cubic yards of riprap would be placed at inlet and outlet of the culvert.

*Construction Activities***.** The proposed action will entail the placement of a total of 90 cubic yards of materials, of which 70 cubic yards will be placed below mean high water (MHW). Construction (tide gate removal and replacement, levee fill and rock placement) will occur in the dry during minus tide above the water surface elevation or at very low water levels and is expected to last no more than three days (with any work below MHW expected to last less than 6 hours). Upon subsequent inundation of the project area, sediment will be suspended, resulting in a plume of suspended sediment that may extend 500 feet downstream and 100 feet upstream (due to tidal ebb and flow). In addition, accidental discharge of petrochemicals from the equipment may occur and degrade water quality. These effects will be localized and temporary.

Hydraulic capacity. The new culvert installation will more closely mimic tidal cycles than the current iron tide gate with an increase of inundation in the unnamed tributary. However, the amount of available inundation from the Little Nestucca River will greatly exceed the hydraulic capacity of the tide gate, and a significant 'choke point' will continue to reduce the amount of available inundation into the upstream tributary.

The proposed action of replacing the tide gate will result in a continued reduction of estuarine connectivity and habitat quality in the unnamed tributary, but is an overall improvement from the current condition due to the addition of side-hinged, aluminum tide gate and a larger culvert. Habitat, refugia, and rearing areas for OC coho salmon will be greater than the current conditions, but will continue to be degraded below a natural, free flowing tributary.

*Temperature***.** Temperature regimes within tidal channels are influenced by a number of factors, including sun exposure/shade, width and depth of the channel, groundwater and hyporheic flow, and the amplitude and regularity of tidal exchange. Tide gates by their nature limit tidal exchange which can cause freshwater stagnation and will increase upstream water temperatures in the valley. The proposed 48-inch tide gate will almost completely shut on the flood tides which will slow tidal circulation. During summer months, temperatures within the valley wetland are likely to rise when the tide gate closes.

*Water Quality***.** While the proposed tide gate will allow more exchange than before it will not reflect a natural flow between the tributary and river. The disruption of tidally influenced flushing flows and circulation is likely to cause localized increases in water nutrient concentration and turbidity in addition to reductions in dissolved oxygen as the water behind the tide gate in the unnamed tributary will increase in temperature (Giannico and Souder 2004). Soil salinity is likely to be reduced because tide gates prevent brackish tidewaters from reaching past dikes, and the freshwater that is allowed to drain toward the estuary removes salt from soils over time. The static environment behind the tide gate is likely to cause thermal loading and growth of periphyton and planktonic algae during portions of the year (mid to late summer). This also leads to elevated water temperatures and reduced dissolved oxygen levels that discharge on outgoing tides during juvenile OC coho salmon rearing periods. However, the proposed new tide gate provides twice daily tidal exchange/flushing which is likely to reduce the duration of these effects.

The physical effects of tide gates include elimination of upland tidal flooding and changes in the velocity, turbulence, and pattern of freshwater discharge that fluctuates between water stagnation and flushing flows. In turn, these changes in the circulation of water between both sides of a levee cause alteration in water temperatures, soil moisture content, sediment transport, and channel morphology (Giannico and Souder 2004).

Riparian Functions. Replacement of the tide gate culvert and the levee repair, requiring levee removal and placement of rock armoring around the tide gates, will involve removal of riparian vegetation in the vicinity of the tide gates, to the extent there is any such vegetation currently. The de-vegetated area will be less than 50 feet on either side of the tide gate. Because this tide gate, like most, is installed in a levee, the affected area has little or no functional riparian vegetation. There is little to no large woody vegetation in the area, and grasses and small shrubs

dominate. Removal of vegetation in this condition should restore naturally within five years of construction.

Effects on Oregon Coast Coho Salmon.

The tide gate and levee construction will generally occur in the dry during summer (July 1 – September 15) when juvenile OC coho salmon are less likely to be present in the action area because they have moved out of the river to more marine habitats (Table 5). Adult OC coho salmon are less likely to be in the action area during this time, though upstream migration may being as early as 1 September.

Table 5. Timing of OC coho salmon in the Nestucca River and tributaries[3].

OC coho salmon	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Upstream Adult Migration												
Adult Spawning												
Juvenile Rearing												
Downstream Juvenile Migration												

Represents periods of peak use based on professional opinion.
Represents lesser level of use based on professional opinion.
Represents periods of presence, either with no level of use OR uniformly distributed level of use indicated

Suspended Sediment. Suspended sediment may not be harmful to fish if it occurs over short-time frames (ODEQ 2005). In this case, suspended sediment levels from construction related activities will be of both a short-time frame and not of high magnitude due to all construction activities taking place during low tide or in the dry over a period of only three days. However, during high tides when water inundates the project area, sediment generated during construction is likely to mobilize and generate pulses of turbidity before settling out of the water column. However, NMFS expects only a small number of juvenile OC coho salmon to be present during in-water work (Table 4). Given the small area affected, the temporary duration (hours to days) of construction, and the small number of ESA-listed salmon likely to be in the area at the time, only a few juvenile OC coho salmon are likely to be affected. Depending on the concentrations of suspended solids, fish will either seek refuge in adjacent areas with less turbidity. Death or injury to juvenile OC coho salmon from increases in suspended sediment is not likely during the summer in-water work window when densities of juvenile fish are low. Behavioral effects are likely to occur and would include decreased foraging behaviors, reducing juvenile growth and survival in a small number of fish. We discounted any effects from construction related suspended sediment on adult OC coho salmon because of the lack of exposure due to the in-water work timing occurs before adults will occur within the action area.

Tide Gate Operations. Like all conventional tide gates, the new tide gate closes on incoming tides. There is no tide gate operation plan and the new tide gate is assumed to shut almost

[3] ODFW (Oregon Department of Fish and Wildlife). 2003. Timing data for Nestucca River and tributaries - anadromous species (Timing Unit ID: 10228).

completely. Juvenile and adult OC coho salmon passage upstream of the tide gate to the unnamed tributary will be limited to ebbing (outgoing) tides when the tide gate flap is open and velocities exiting the tide gate may be too great during rapidly falling tides for some juvenile OC coho to surpass. However, within estuarine habitats, juvenile coho salmon do not readily migrate upstream during ebb (outgoing) tides. To the contrary, juveniles generally enter into upstream habitat with incoming tides, as evidence by numerous studies that have captured juvenile coho in fyke nets (SSC 2003).

Upgrades to these private structures and their continued operation harms OC coho salmon by limiting adult and juvenile access to habitat upstream of the tide gate and trapping outgoing juvenile OC coho salmon and resident fish when the tide gate is closed. The proposed side-hinged aluminum tide gate will increase the time the tide gate is open and will open earlier and close later in the tidal cycle than the top-hinged iron gate it is replacing. However, this tide gate and its operation by the landowner will continue to be a barrier to fish passage during the time it is closed, preventing free OC coho salmon migration, deteriorating the quality and connectivity of their habitats, and injuring or killing juvenile OC coho salmon caught upstream of the levee when the tide gate is closed.

Static environmental conditions behind the tide gate will cause the water that drains from the tide gate on outgoing tides to be degraded. Water quality parameters affected would likely include reduced dissolved oxygen and increased temperatures. Degraded water quality draining from the gate may block or slow fish movement.

Summary of Effects on Habitat and OC coho salmon. Therefore, the proposed action will result in degraded habitat conditions for juvenile and OC coho salmon from natural, free-flowing conditions, but better than the current condition. The reductions of water quality, wetted width of the unnamed tributary, and availability and access to foraging habitat will cause habitat-related effects that cannot be accurately quantified as a number of fish because the relationship between habitat conditions and the distribution and abundance of those individuals in the action area is imprecise. However, it is likely that through intermittent, localized water quality effects in estuarine habitat during tidal exchanges between the unnamed tributary and the Little Nestucca River, some adult and juvenile OC coho salmon may be exposed to conditions that result in increased physiological stress that is reasonably certain to cause minor reductions in growth which will increase the likelihood of death or injury for a few individuals each year for the life of the tide gate. Given this, however, the number of individuals affected is too small to have a meaningful effect on abundance or other population characteristics. At the species level, direct biological effects are synonymous with those at the population level or, more likely, are the integrated demographic response of one or more subpopulations (McElhany *et al.* 2000). Because the likely effects are too small to affect the characteristics of the salmon population, they are also too small to have any affect at the species level.

Effects on Critical Habitat in the Action Area.

OC coho salmon use the action area for rearing and migration. The action area is in the Little Nestucca watershed (HUC 171002030103), which is designated as critical habitat for OC coho salmon. The CHART rated the watershed as having “medium” conservation value (NOAA

Fisheries 2007). The action area includes the freshwater rearing, freshwater migration and estuarine area PCEs.

Freshwater rearing sites.
Water quantity – Overall reduced hydraulic capacity due to constraining features of the tide gate.
Floodplain connectivity – The installation of the larger 48-inch culvert and side-hinged tide gate will slightly increase tidal inundation behind the tide gate, though its presence will continue to impede floodplain connectivity overall.
Water quality – The replacement of the tide gate will maintain the static environmental conditions in the unnamed tributary through truncation of the tidal range. This causes reduced circulation in which degraded water quality would drain from the tide gate on outgoing tides into the Little Nestucca River. Water quality parameters affected would include a short term increase in suspended sediment and long term effects that include: reduced dissolved oxygen, increased temperatures, and increased nutrient concentration due to reduction of upland flooding and reduction of flushing flows.
Forage – No reduction in forage.
Natural cover – Currently, riparian vegetation is extremely limited in the vicinity of the tide gates. Following construction, the levee will be seeded with native grasses, slightly increasing natural cover.

Freshwater migration.
Free of artificial obstruction – The proposed action will have an effect on passage. Though the current degraded tide gate will be replaced with a wider one, the tide gate presence will still harm OC coho salmon by limiting adult and juvenile access to habitat upstream of the tide gate and trapping outgoing juvenile OC coho salmon and resident fish when the tide gate is closed. The proposed side-hinged aluminum tide gate will increase the time the tide gate is open and will open earlier and close later in the tidal cycle than the top-hinged iron gate it is replacing. However, this tide gate will continue to be a barrier to fish passage during the time it is closed, preventing free OC coho salmon migration and deteriorating the quality and connectivity of their habitats.
Water quantity – See above.
Water quality – See above.
Natural cover - See above.

Estuarine areas.
Forage – See above.
Water quantity – See above.
Free of artificial obstruction - See above.
Water quality – See above.
Natural cover – See above.
Salinity - The replacement of the tide gate will maintain the static environmental conditions in the unnamed tributary through truncation of the tidal range. Because tide gates prevent brackish tidewaters from reaching past levees, the freshwater that is allowed to drain to the Little Nestucca River will remove salt from soils overtime.

Summary of Effects on Critical Habitat. The effects of the levee repair, culvert extension and tide gate replacement are likely to reduce the quality and function of essential habitat features of critical habitat and lead to localized changes of critical habitat PCEs for water quality, quantity, floodplain connectivity and free passage. When the amount of affected critical habitat in the action area is compared to the available freshwater and estuarine habitat within the Little Nestucca fifth-field watershed it was determined the action will not reduce the conservation value of critical habitat in the fifth-field.
Each fifth-field HUC in the OC coho salmon species is important to the population or populations it supports and the likelihood of promoting species conservation across the entire OC coho salmon critical habitat designation area. Impacts at the fifth-field watershed level affect the range-wide conservation value of OC coho salmon critical habitat. Contributing factors to the decline of the range-wide condition of OC coho salmon critical habitat include degradation to PCEs that are limiting the conservation value of OC coho salmon critical habitat and baseline conditions previously described in this opinion. The effects of the proposed action were not determined to further degrade the PCEs limiting the conservation value of the action affected fifth-field watershed and therefore the effects of the proposed action will not degrade the conservation value of designated critical habitat across the entire range of OC coho salmon.

2.5 Cumulative Effects

"Cumulative effects" are those effects of future state or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation (50 CFR 402.02). Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA. The action area is likely to experience cumulative effects or state or private actions at intensities that are similar to recent years, but NMFS is not aware of any specific proposals for any specific non-Federal actions that are planned and would affect the action area.

By 2040, the population of Tillamook County will grow approximately 20% (ODAS 2004). Most of this growth will occur in the county's more populated cities, of which Pacific City sits at the mouth of the Nestucca Bay, 3.5 miles downstream from the action area. Population growth, associated development, as well as maintenance and upgrading of the existing infrastructure, are likely in the foreseeable future for the Little Nestucca River. Such development is likely to further reduce the availability and value of floodplain and wetland habitats used by OC coho salmon in the action area.

In addition, NMFS does not consider current state agriculture and forestry practices as sufficiently protective of aquatic habitat (76 FR 35755). Agricultural land use and timber harvesting on non-Federal lands in the Nestucca Bay watersheds are expected to continue to effect habitat values in the action area.

2.6 Integration and Synthesis

The Integration and Synthesis Section is the final step in our assessment of the risk posed to species and critical habitat as a result of implementing the proposed action. In this section, we will add the effects of the action (Section 2.4) to the environmental baseline (Section 2.3) and the

cumulative effects (Section 2.5) to formulate the agency's biological opinion as to whether the proposed action is likely to: (1) Reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing its numbers, reproduction, or distribution; or (2) reduce the value of designated or proposed critical habitat for the conservation of the species. These assessments are made in full consideration of the status of the species and critical habitat (Section 2.2).

OC Coho Salmon.

When added to the status of the species, the environmental baseline, and cumulative effects, and in consideration of the species' limiting factors, the effects of the proposed action will not appreciably reduce the likelihood of both the survival and recovery of OC coho salmon in the wild by reducing its numbers, reproduction, or distribution. In our analysis above, we determined that the construction and tide gate related effects of replacing the tide gate and repairing the levee will directly injure or kill a small number of juvenile OC coho salmon each year for the life of the tide gate. However, the number of individuals injured or killed is far too small to reduce the abundance or productivity of the Nestucca population of OC coho salmon. This independent population has average returns of over 3413 adults over the last 15 years (1996-2010) and the effect of losing a small number of juvenile OC coho salmon on population abundance and productivity would be immeasurable. The proposed action will have no impact on population spatial structure or diversity. Because there would be no measurable effects to the viability of the Nestucca population, the only population affected, the proposed action would not reduce the ability of the species as a whole to survive and recover.

At a larger scale, because of the habitat factors and the indirect physiological effects to OC coho salmon from proposed activities will be localized and low severity, the effects analysis demonstrated that the proposed action will not affect the abundance, productivity, distribution, or genetic diversity of OC coho salmon at the population scale. Therefore, the proposed action is not likely to appreciably reduce the survival and recovery of OC coho salmon.

Critical Habitat.

The habitat quality of the Little Nestucca watershed is degraded but the conservation value of this area is medium. Numerous natural and human-induced disturbances have occurred during the past 150 years. The Corps is proposing to permit the replacement of a 42-inch diameter culvert (67 feet long) that has an attached iron top-hinge tide gate, with a 48-inch diameter culvert (87 feet long) that has an attached aluminum side-hinged tide gate, as well as repair the levee in the project area.

Information presented in the status and baseline sections has shown that the construction of flood control levees and water control structures have contributed to a reduction of the conservation value of critical habitat PCEs for the OC coho salmon in the Little Nestucca River. The installation of the tide gate and the associated levee repairs will perpetuate these conditions. While the proposed action does not reverse this historical trend, the proposed tide gate replacement will slightly increase tidal inundation to the unnamed tributary upstream. All effects on critical habitat would result from suspended sediment due to construction related activities

and from changes in hydrology due to the tide gate replacement which would affect the rate of delivery of water, sediments, and nutrients to surface waters, and thereby affect other physical parameters such as temperature, dissolved oxygen, and turbidity. The twice daily tidal fluctuations will be partially arrested, cutting off the direct connection to the upstream, unnamed tributary. Although NMFS cannot quantify the magnitude of such change, the change will be localized, minor and small in severity and scale.

The effects analysis also demonstrated that the adverse effects of the proposed action on critical habitat PCEs will be brief or limited to the site scale, so that critical habitat PCEs will retain their current ability to become functionally established as necessary to serve the intended conservation role for the species at the scale of the designation.

2.7 Conclusion

After reviewing the current status of the listed species, the environmental baseline within the action area, the effects of the proposed action, any effects of interrelated and interdependent actions, and cumulative effects, it is NMFS' biological opinion that the proposed action is not likely to jeopardize the continued existence of OC coho salmon or destroy or adversely modify its designated critical habitat.

2.8 Incidental Take Statement

Section 9 of the ESA and Federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without a special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by regulation to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. For this consultation, we interpret "harass" to mean an intentional or negligent action that has the potential to injure an animal or disrupt its normal behaviors to a point where such behaviors are abandoned or significantly altered.[4] Section 7(b)(4) and section 7(o)(2) provide that taking that is incidental to an otherwise lawful agency action is not considered to be prohibited taking under the ESA if that action is performed in compliance with the terms and conditions of this incidental take statement.

[4] The NMFS has not adopted a regulatory definition of harassment under the ESA. The World English Dictionary defines harass as "to trouble, torment, or confuse by continual persistent attacks, questions, etc." The U.S. Fish and Wildlife Service defines "harass" in its regulations as "an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering (50 CFR 17.3). The interpretation we adopt in this consultation is consistent with our understanding of the dictionary definition of harass and is consistent with the Service's interpretation of the term.

2.8.1 Amount or Extent of Take

The effects of the proposed action will occur where adult and juvenile OC coho salmon are present. The action area is adult and juvenile estuarine rearing and migration habitat. The condition of the habitat is degraded, but is essential to these life stages. Incidental take caused by the proposed action will include adverse effects associated both with construction activities and with continued degraded habitat loss after construction is completed that is expected to persist for the life of the project. This take will occur within an area encompassing the unnamed tributary upstream of the tide gate and the Little Nestucca River adjacent to the tide gate. Incidental take within that area that meets the terms and conditions of this incidental take statement will be exempt from the taking prohibition.

While we have determined the amount of take will be limited, take caused by the effects of this action cannot be accurately quantified as a number of fish because the distribution and abundance of fish that occur within an action area are affected by habitat quality, competition, predation, and the interaction of processes that influence genetic, population, and environmental characteristics. These biotic and environmental processes interact in ways that may be random or directional and operate across far broader temporal and spatial scales than will be affected by the proposed action. Thus, the distribution and abundance of fish in the action area cannot be precisely predicted based on existing habitat conditions. Also, there is no practical way to observe or count the fish injured or killed by the proposed action. In such circumstances, we use the causal link established between the activity and the likely changes in habitat conditions affecting the listed species to describe the extent of take as a numerical level of habitat disturbance.

Here, the best available indicators for the extent of take are the extent of the sediment plume from construction and the water surface elevations that will be modified by the action. These features best integrate the likely take pathways associated with this action in the short-term (sediment) and over the long term (water levels), are directly proportional to the impacts attributable to this project, and are directly related to the amount of habitat that will be affected as a result of tide gate operations. Thus, the extent of take indicators that will be used as reinitiation triggers for this consultation are: (1) Suspended sediment plumes during construction that exceed 10% over the baseline levels when measured 100 feet from the boundary of construction activities (both upstream and downstream), and (2) failing to maintain daily minimum water surface elevations behind the tide gate equal to or greater than 2.0 feet NAVD88 (the North American Vertical Datum of 1988). Either an increase in suspended sediment during construction activities or a water level behind the tide gate that is below 2.0 feet NAVD88 will trigger the reinitiation provisions of this Opinion.

In the accompanying Opinion, NMFS determined that this amount of incidental take is not likely to result in jeopardy to the species. Exceeding these limits will trigger the re-initiation provisions of this Opinion.

2.8.2 Effect of the Take

In Section 2.7, NMFS determined that the level of anticipated take, coupled with other effects of the proposed action, is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat.

2.8.3 Reasonable and Prudent Measures

"Reasonable and prudent measures" are nondiscretionary measures to minimize the amount or extent of incidental take (50 CFR 402.02). The following measures are necessary and appropriate to minimize the impact of incidental take of listed species from the proposed action.

The Corps shall:

1. Minimize incidental take resulting from the installation of the new 48" culvert (87' long), aluminum side-hinge tide gate, and the levee fill and repair by applying measures to avoid or minimize adverse effects to OC coho salmon or their critical habitat.
2. Ensure completion of a monitoring and reporting program to confirm that the take exemption for the proposed action is not exceeded, and that the terms and conditions in this incidental take statement are effective in minimizing incidental take.

2.8.4 Terms and Conditions

The terms and conditions described below are non-discretionary, and the Corps or any applicant must comply with them in order to implement the reasonable and prudent measures (50 CFR 402.14). The Corps or any applicant has a continuing duty to monitor the impacts of incidental take and must report the progress of the action and its impact on the species as specified in this incidental take statement (50 CFR 402.14). If the following terms and conditions are not complied with, the protective coverage of section 7(o)(2) will likely lapse.

1. To implement reasonable and prudent measure #1 (minimize take resulting from the tide gate replacement and levee repair), the Corps shall ensure that:

    a. Any excavation activity below the ordinary high water (OHW) line shall be conducted to the maximum extent possible above the water surface during low tide cycles and low flow cycles in the Little Nestucca River and adjacent tributary. Motorized equipment used to repair or replace a damaged tide gate or floodgate shall only be operated from above the OHW line.
    b. Require that the applicant disturb no more than the absolute minimal amounts of soil and vegetation necessary to repair or replace the damaged tide gate or floodgate. Following installation, disturbed soils at the project site shall be protected from erosion using vegetation and/or other means. Disturbed surfaces shall be covered with topsoil and planted with native grasses and woody vegetation.

2. To implement reasonable and prudent measure #2 (monitoring), the Corps shall provide a report to NMFS that contains the following:

a. Within 60 days of project completion, prepare and submit a report to NMFS describing the Corps's success in meeting the terms and conditions contained in this opinion. The content of the project completion report will include:

i. Project identification
   (1) project name
   (2) type of activity
   (3) project location by 5th field United States Geological Service (USGS) HUC and by latitude and longitude as determined from the appropriate 7-minute USGS quadrangle map
   (4) United States Army Corps of Engineers (Corps) contact person(s)
   (5) Starting and ending dates for work completed
   (6) Starting and ending dates of in-water work completed

ii. Photo documentation. Photos of habitat conditions at the project site before, during and after project completion.[5]
   (1) Include general views and close-ups showing details of the project and project area, including pre- and post-construction.
   (2) Label each photo with date, time, project name, photographer's name, and the subject.

iii. Other data. Include the following specific project data in the project completion report:
   (1) A summary of pollution and erosion control inspection results, including a description of any erosion control failure, contaminant release, and efforts to correct such incidences.
   (2) Any incidence of observed fish injury or mortality.

b. Water level. The Corps shall ensure that monitoring over an entire tidal cycle shall occur and contain the following components.
   (1) Staff gauge measurements at the river side and tributary side shall be recorded at high tide and low tide levels. These measurements shall be representative of seasonal changes (winter, summer, spring, fall) and shall occur no less than four times a year for one year.
   (2) Photographs of the tide gate and the two open culverts during these periods.

c. Turbidity Monitoring Complete turbidity monitoring as follows:

i. Equipment. Use an appropriate and regularly calibrated turbidometer to quantify change as nephlometic turbidity units (NTU), or use a visual observation based on any detectable change.

ii. Interval. A turbidometer reading, or visual observation, must be taken as often as necessary to ensure that the work area is not contributing excessive sediment to the stream.

[5] Relevant habitat conditions may include characteristics of stream channels, eroding and stable streambanks in the project area, riparian vegetation, water quality, flows at base, bankfull and over-bankfull stages, and other visually-discernable environmental conditions at the project area, and upstream and downstream from the project.

iii. Sites. Each sample consists of a turbidometer reading, or a visual observation, made at a baseline site upstream of each work area, and a corresponding reading or observation made downstream of each work area. Establish a baseline and a compliance site for each work area as follows.

iv. Select a baseline site at a relatively undisturbed area approximately 100 feet upstream from the work area to determine background turbidity. Record the location of the baseline site, the date and time of the turbidity sample, and the turbidity before monitoring downstream. Note any other relevant sampling conditions (*e.g.*, weather, river stage, upstream activity, onsite activity).

v. Select a compliance site approximately 100 feet downstream of the work area, and compare with the baseline site (which is explained in v, above). Record the location of the compliance site, the date and time of the turbidity sample, and the turbidity. Note any other relevant sampling conditions.

vi. Compliance.

(1) Compare results from the baseline and compliance sites for each sample to determine whether turbidity increased below the work area.

(2) If turbidity increased to any visible extent, continue to monitor every four hours and take corrective action to reduce turbidity, including any work necessary to repair, replace or reinforce sediment controls.

(3) If the turbidity does not return to baseline level within one day, contact NMFS and cease work until turbidity returns to baseline.

d. A monitoring report addressing the data required above shall be submitted to the Corps and to NMFS by October 1, 2013, at the address below.

National Marine Fisheries Service
Attn: 2011/05745
Oregon State Habitat Office
Habitat Conservation Division
1201 NE Lloyd Boulevard, Ste. 1100
Portland, Oregon 97232

c. If a sick, injured or dead specimen of a threatened or endangered species is found in the project area, the finder must notify NMFS through the contact person identified in the transmittal letter for this opinion, or through NMFS Office of Law Enforcement at 1-800-853-1964, and follow any instructions. If the proposed action may worsen the fish's condition before NMFS can be contacted, the finder should attempt to move the fish to a suitable location near the capture site while keeping the fish in the water and reducing its stress as much as possible. Do not disturb the fish after it has been moved. If the fish is dead, or dies while being captured or moved, report the following information: (1) The NMFS consultation number (found on the top left of the transmittal letter for this opinion); (2) the date, time, and location of discovery; (3) a brief description of circumstances and

any information that may show the cause of death; and (4) photographs of the fish and where it was found. The NMFS also suggests that the finder coordinate with local biologists to recover any tags or other relevant research information. If the specimen is not needed by local biologists for tag recovery or by NMFS for analysis, the specimen should be returned to the water in which it was found, or otherwise discarded.

2.9 Conservation Recommendations

Section 7(a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. Specifically, conservation recommendations are suggestions regarding discretionary measures to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information (50 CFR 402.02).

1. To allow for the greatest fish passage and exchange of water between the unnamed tributary and the Little Nestucca River, develop both an operation and monitoring plan in conjunction with NMFS and conduct monitoring post-project implementation.

2.10 Reinitiation of Consultation

As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) The amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action.

2.11 "Not Likely to Adversely Affect" Determinations

Our concurrence or finding of the determination, "may affect, not likely to adversely affect" must be based on our finding that the effects are all expected to be discountable, insignificant, or completely beneficial. Discountable effects are those extremely unlikely to occur. Based on best judgment, a person would not: (1) Be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Beneficial effects are contemporaneous positive effects without any adverse effects to the species. Refer to the biological opinion for a description of the proposed action and action area.

Green sturgeon. Green sturgeon may occur off the Nestucca Bay in marine waters during the in-water work period of July 1 to September 15 (Lindley *et al*. 2008). However, given that green sturgeon presence in the lower Little Nestucca River is undocumented, and the short

period of in-water construction (6 hours below OHW), we find that green sturgeon are extremely unlikely to be affected. Therefore, we conclude the effects are discountable and that the proposed action "may affect, but is not likely to adversely affect" green sturgeon.

Eulachon. Eulachon have never been observed in the lower Little Nestucca River and designated critical habitat does not occur in the action area. However, limited survey work has occurred in the bay during the period when the species is likely present. Given the presence of suitable habitat and the absence of sufficient eulachon surveys, we find that eulachon presence in the action area during project implementation is possible though extremely unlikely.

Given that, based on the best available information, eulachon presence is extremely unlikely to occur in the action area, we conclude the effects are discountable and that the proposed action "may affect, but is not likely to adversely affect" eulachon.

3. MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT ESSENTIAL FISH HABITAT CONSULTATION

The consultation requirement of section 305(b) of the MSA directs Federal agencies to consult with NMFS on all actions or proposed actions that may adversely affect EFH. The MSA (section 3) defines EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Adverse effects occur when EFH quality or quantity is reduced by a direct or indirect physical, chemical, or biological alteration of the waters or substrate, or by the loss of (or injury to) benthic organisms, prey species and their habitat, or other ecosystem components. Adverse effects on EFH may result from actions occurring within EFH or outside of it and may include site-specific or EFH-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810). Section 305(b) also requires NMFS to recommend measures that can be taken by the action agency to conserve EFH.

This analysis is based, in part, on the EFH assessment provided by the Federal action agency and descriptions of EFH contained in the fishery management plans developed by the PFMC and approved by the Secretary of Commerce for groundfish (PFMC 2005), coastal pelagic species (PFMC 1998), and Pacific salmon (PFMC 1999).

3.1 Essential Fish Habitat Affected by the Project

The PFMC described and identified EFH for Pacific salmon (PFMC 1999). The proposed action and action area for this consultation are described in the Introduction for this document (Section 1). The action area includes area designated as EFH for Pacific Coast groundfish, coastal pelagics, and coho and Chinook salmon. In addition, the following HAPC is present in the action area: estuary.

3.2 Adverse Effects on Essential Fish Habitat

Based on information provided by the Corps and the analysis of effects presented in the ESA portion of this document:

- We conclude that the proposed action will have the following adverse effects on EFH designated for Pacific salmon, groundfish and coastal pelagics:
    - short-term increase in suspended sediments and turbidity
    - short-term loss of riparian function
    - short-term total exclusion of fish from rearing habitat for purposes of tide gate replacement and levee repair
    - long-term fish passage barrier for juveniles during the time that the tide gate is completely closed
    - These effects will reduce EFH connectivity, reducing its suitability for feeding and growth to maturity.
        - Affected habitat includes:
        - Water column
        - Substrate
        - Benthic productivity
        - Prey
        - Estuary (HAPC)

3.3 Essential Fish Habitat Conservation Recommendations

The NMFS expects that fully implementing these EFH conservation recommendations would protect, by avoiding or minimizing the adverse effects described in Section 3.2 above, approximately 50 acres of designated EFH for Pacific salmon.

We recommend the Corps:

1. Follow term and condition 1 as presented in the ESA portion of this document to minimize adverse effects to water quality and the ecology of aquatic systems from project-related activities (implementation).
2. Follow term and condition 2 as presented in the ESA portion of this document to ensure completion of a monitoring and reporting program.
3. Implement the conservation recommendation presented as part of the ESA portion of this document.

3.4 Statutory Response Requirement

As required by section 305(b)(4)(B) of the MSA, the Corps must provide a detailed response in writing to NMFS within 30 days after receiving an EFH Conservation Recommendation. Such a response must be provided at least 10 days prior to final approval of the action if the response is inconsistent with any of NMFS' EFH Conservation Recommendations unless NMFS and the Federal agency have agreed to use alternative time frames for the Federal agency response. The response must include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with the Conservation Recommendations, the Federal agency must explain its reasons for not following the recommendations, including the scientific justification for any disagreements with NMFS over the anticipated effects of the action and the measures needed to avoid, minimize, mitigate, or offset such effects (50 CFR 600.920(k)(1)).

In response to increased oversight of overall EFH program effectiveness by the Office of Management and Budget, NMFS established a quarterly reporting requirement to determine how many conservation recommendations are provided as part of each EFH consultation and how many are adopted by the action agency. Therefore, we ask that in your statutory reply to the EFH portion of this consultation, you clearly identify the number of conservation recommendations accepted.

3.5 Supplemental Consultation

The Corps must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH conservation recommendations (50 CFR 600.920(l)).

4. DATA QUALITY ACT DOCUMENTATION AND PRE-DISSEMINATION REVIEW

The Date Quality Act (DQA) specifies three components contributing to the quality of a document. They are utility, integrity, and objectivity. This section of the opinion addresses these DQA components, documents compliance with the DQA, and certifies that this opinion has undergone pre-dissemination review.

4.1 Utility

Utility principally refers to ensuring that the information contained in this consultation is helpful, serviceable, and beneficial to the intended users. The intended users of this opinion are the Corps and the applicant, Lloyd Higdon. This opinion will be posted on the NMFS Northwest Region web site (http://www.nwr.noaa.gov). The format and naming adheres to conventional standards for style.

4.2 Integrity

This consultation was completed on a computer system managed by NMFS in accordance with relevant information technology security policies and standards set out in Appendix III, 'Security of Automated Information Resources,' Office of Management and Budget Circular A-130; the Computer Security Act; and the Government Information Security Reform Act.

4.3 Objectivity

Information Product Category: Natural Resource Plan

Standards: This consultation and supporting documents are clear, concise, complete, and unbiased; and were developed using commonly accepted scientific research methods. They adhere to published standards including the NMFS ESA Consultation Handbook, ESA regulations, 50 CFR 402.01, et seq., and the MSA implementing regulations regarding EFH, 50 CFR 600.

Best Available Information: This consultation and supporting documents use the best available information, as referenced in the References Section. The analyses in this opinion/EFH consultation contain more background on information sources and quality.

Referencing: All supporting materials, information, data and analyses are properly referenced, consistent with standard scientific referencing style.

Review Process: This consultation was drafted by NMFS staff with training in ESA and MSA implementation, and reviewed in accordance with Northwest Region ESA quality control and assurance processes.

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