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## Endangered and Threatened Wildlife and Plants: Final Rulemaking To Designate Critical Habitat for the Threatened Southern Distinct Population Segment of North American Green Sturgeon; Final Rule

**DEPARTMENT OF COMMERCE**

**National Oceanic and Atmospheric Administration**

**50 CFR Part 226**

**[Docket No. 080730953–91263–02]**

**RIN 0648–AX04**

# Endangered and Threatened Wildlife and Plants: Final Rulemaking To Designate Critical Habitat for the Threatened Southern Distinct Population Segment of North American Green Sturgeon

**AGENCY:** National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

**ACTION:** Final rule.

**SUMMARY:** We, the National Marine Fisheries Service (NMFS), designate critical habitat for the threatened Southern distinct population segment of North American green sturgeon (Southern DPS of green sturgeon) pursuant to section 4 of the Endangered Species Act (ESA). Specific areas proposed for designation include: Coastal U.S. marine waters within 60 fathoms (fm) depth from Monterey Bay, California (including Monterey Bay), north to Cape Flattery, Washington, including the Strait of Juan de Fuca, Washington, to its United States boundary; the Sacramento River, lower Feather River, and lower Yuba River in California; the Sacramento-San Joaquin Delta and Suisun, San Pablo, and San Francisco bays in California; the lower Columbia River estuary; and certain coastal bays and estuaries in California (Humboldt Bay), Oregon (Coos Bay, Winchester Bay, Yaquina Bay, and Nehalem Bay), and Washington (Willapa Bay and Grays Harbor). This rule designates approximately 515 kilometer (km) (320 miles (mi)) of freshwater river habitat, 2,323 km$^2$ (897 mi$^2$) of estuarine habitat, 29,581 km$^2$ (11,421 mi$^2$) of marine habitat, 784 km (487 mi) of habitat in the Sacramento-San Joaquin Delta, and 350 km$^2$ (135 mi$^2$) of habitat within the Yolo and Sutter bypasses (Sacramento River, CA) as critical habitat for the Southern DPS of green sturgeon.

This rule excludes the following areas from designation because the economic benefits of exclusion outweigh the benefits of inclusion and exclusion will not result in the extinction of the species: Coastal U.S. marine waters within 60 fm depth from the California/Mexico border north to Monterey Bay, CA, and from the Alaska/Canada border northwest to the Bering Strait; the lower Columbia River from river kilometer (RKM) 74 to the Bonneville Dam; and certain coastal bays and estuaries in California (Elkhorn Slough, Tomales Bay, Noyo Harbor, and the estuaries to the head of the tide in the Eel and Klamath/Trinity rivers), Oregon (Tillamook Bay and the estuaries to the head of the tide in the Rogue, Siuslaw, and Alsea rivers), and Washington (Puget Sound). Particular areas are also excluded based on impacts on national security and impacts on Indian lands. The areas excluded from the designation comprise approximately 0.2 km (0.1 mi) of freshwater habitat, 2,945 km$^2$ (1,137 mi$^2$) of estuarine habitat and 1,034,935 km$^2$ (399,590 mi$^2$) of marine habitat.

This final rule responds to and incorporates public comments received on the proposed rule and supporting documents, as well as peer reviewer comments received on the draft biological report and draft ESA section 4(b)(2) report.

**DATES:** This rule will take effect on November 9, 2009.

**ADDRESSES:** Reference materials regarding this determination can be obtained via the Internet at: *http://www.nmfs.noaa.gov* or by submitting a request to the Assistant Regional Administrator, Protected Resources Division, Southwest Region, NMFS, 501 West Ocean Blvd., Suite 4200, Long Beach, CA 90802–4213.

**FOR FURTHER INFORMATION CONTACT:** Melissa Neuman, NMFS, Southwest Region (562) 980–4115; Steve Stone, NMFS, Northwest Region (503) 231–2317; or Lisa Manning, NMFS, Office of Protected Resources (301) 713–1401.

**SUPPLEMENTARY INFORMATION:**

## Background

Under the ESA, we are responsible for determining whether certain species, subspecies, or distinct population segments (DPS) are threatened or endangered, and designating critical habitat for them (16 U.S.C. 1533). On April 7, 2006, we determined that the Southern DPS of green sturgeon is likely to become endangered in the foreseeable future throughout all or a significant portion of its range and listed the species as threatened under the ESA (71 FR 17757). A proposed critical habitat rule for the Southern DPS was published in the **Federal Register** on September 8, 2008 (73 FR 52084), with a technical correction and notification of a public workshop published on October 7, 2008 (73 FR 58527). Pursuant to a court-ordered settlement agreement, NMFS agreed to make a final critical habitat designation for the Southern DPS by June 30, 2009. However, an extension was requested and granted, with a new deadline of October 1, 2009. This rule describes the final critical habitat designation, including responses to public comments and peer reviewer comments, a summary of changes from the proposed rule, and supporting information on green sturgeon biology, distribution, and habitat use, and the methods used to develop the final designation.

We considered various alternatives to the critical habitat designation for the green sturgeon. The alternative of not designating critical habitat for the green sturgeon would impose no economic, national security, or other relevant impacts, but would not provide any conservation benefit to the species. This alternative was considered and rejected because such an approach does not meet the legal requirements of the ESA and would not provide for the conservation of green sturgeon. The alternative of designating all potential critical habitat areas (*i.e.,* no areas excluded) also was considered and rejected because, for a number of areas, the economic benefits of exclusion outweighed the benefits of inclusion, and NMFS did not determine that exclusion of these areas would significantly impede conservation of the species or result in extinction of the species. The total estimated annualized economic impact associated with the designation of all potential critical habitat areas would be $64 million to $578 million (discounted at 7 percent) or $63.9 million to $578 million (discounted at 3 percent).

An alternative to designating critical habitat within all of the units considered for designation is the designation of critical habitat within a subset of these units. Under section 4(b)(2) of the ESA, NMFS must consider the economic impacts, impacts to national security, and other relevant impacts of designating any particular area as critical habitat. NMFS has the discretion to exclude an area from designation as critical habitat if the benefits of exclusion (*i.e.,* the impacts that would be avoided if an area were excluded from the designation) outweigh the benefits of designation (*i.e.,* the conservation benefits to the Southern DPS if an area were designated), so long as exclusion of the area will not result in extinction of the species. Exclusion under section 4(b)(2) of the ESA of one or more of the units considered for designation would reduce the total impacts of designation. The determination of which units and how many to exclude depends on NMFS' ESA 4(b)(2) analysis, which is conducted for each unit and described

in detail in the ESA 4(b)(2) analysis report. Under this preferred alternative, NMFS originally proposed to exclude 13 out of 40 units considered. The total estimated economic impact associated with the proposed rule was $22.5 million to $76.4 million (discounted at 7 percent) or $22.5 million to $76.3 million (discounted at 3 percent). In response to public comments and additional information received, this final rule excludes 14 units out of 41 units considered where the economic benefits of exclusion outweighed the conservation benefits of designation. NMFS determined that the exclusion of these 14 units would not significantly impede the conservation of the Southern DPS. The total estimated economic impact associated with this final rule is $20.2 million to $74.1 million (discounted at 7 percent) or $20.1 million to $74 million (discounted at 3 percent). NMFS selected this alternative because it results in a critical habitat designation that provides for the conservation of the Southern DPS while reducing the economic impacts on entities. This alternative also meets the requirements under the ESA and our joint NMFS–USFWS regulations concerning critical habitat.

**Green Sturgeon Natural History**

The green sturgeon (*Acipenser medirostris*) is an anadromous fish species that is long-lived and among the most marine oriented sturgeon species in the family Acipenseridae. Green sturgeon is one of two sturgeon species occurring on the U.S. west coast, the other being white sturgeon (*Acipenser transmontanus*). Green sturgeon range from the Bering Sea, Alaska, to Ensenada, Mexico, with abundance increasing north of Point Conception, CA (Moyle *et al.* 1995). Green sturgeon occupy freshwater rivers from the Sacramento River up through British Columbia (Moyle 2002), but spawning has been confirmed in only three rivers, the Rogue River in Oregon and the Klamath and Sacramento rivers in California. Based on genetic analyses and spawning site fidelity (Adams *et al.* 2002; Israel *et al.* 2004), NMFS has determined green sturgeon are comprised of at least two distinct population segments (DPSs): (1) A Northern DPS consisting of populations originating from coastal watersheds northward of and including the Eel River (*i.e.,* the Klamath and Rogue rivers) (''Northern DPS''); and (2) a southern DPS consisting of populations originating from coastal watersheds south of the Eel River, with the only known spawning population in the Sacramento River (''Southern DPS''). The Northern DPS and Southern DPS are distinguished based on genetic data and spawning locations, but their distribution outside of natal waters generally overlap with one another (Chadwick 1959; Miller 1972; California Department of Fish and Game (CDFG) 2002; Israel *et al.* 2004; Moser and Lindley 2007; Erickson and Hightower 2007; Lindley *et al.* 2008.). Both Northern DPS and Southern DPS green sturgeon occupy coastal estuaries and coastal marine waters from southern California to Alaska, including Humboldt Bay, the lower Columbia river estuary, Willapa Bay, Grays Harbor, and coastal waters between Vancouver Island, BC, and southeast Alaska (Israel *et al.* 2004; Moser and Lindley 2007; Lindley *et al.* 2008).

Spawning frequency is not well known, but the best information suggests adult green sturgeon spawn every 2—4 years (pers. comm. with Steve Lindley, NMFS, and Mary Moser, NMFS, 2004, cited in 70 FR 17386, April 6, 2005; Erickson and Webb 2007). Beginning in late February, adult green sturgeon migrate from the ocean into fresh water to begin their spawning migrations (Moyle *et al.* 1995). Spawning occurs from March to July, with peak activity from mid-April to mid-June (Emmett *et al.* 1991; Poytress *et al.* 2009). Spawning in the Sacramento River occurs in fast, deep water over gravel, cobble, or boulder substrates (Emmett *et al.* 1991; Moyle *et al.* 1995; Poytress *et al.* 2009). Eggs and larvae develop in freshwater, likely near the spawning site (Kynard *et al.* 2005). Development of early life stages is affected by water flow and temperature (optimal temperatures from 11 to 17–18 °C; Cech *et al.* 2000, cited in COSEWIC 2004; Van Eenennaam *et al.* 2005). Juvenile green sturgeon rear and feed in fresh and estuarine waters from 1 to 4 years prior to dispersing into marine waters as subadults (Nakamoto *et al.* 1995).

Adults are defined as sexually mature fish, subadults as sexually immature fish that have entered into coastal marine waters (usually at 3 years of age), and juveniles as fish that have not yet made their first entry into marine waters. Green sturgeon spend a large portion of their lives in coastal marine waters as subadults and adults. Subadult male and female green sturgeon spend at least approximately 6 and 10 years, respectively, at sea before reaching reproductive maturity and returning to freshwater to spawn for the first time (Nakamoto *et al.* 1995). Adult green sturgeon spend as many as 2–4 years at sea between spawning events (pers. comm. with Steve Lindley, NMFS, and Mary Moser, NMFS, cited in 70 FR 17386, April 6, 2005; Erickson and Webb 2007). Prior to reaching sexual maturity and between spawning years, subadults and adults occupy coastal estuaries adjacent to their natal rivers, as well as throughout the West coast, and coastal marine waters within 110 meters (m) depth. Green sturgeon inhabit certain estuaries on the northern California, Oregon, and Washington coasts during the summer, and inhabit coastal marine waters along the central California coast and between Vancouver Island, British Columbia, and southeast Alaska over the winter (Lindley *et al.* 2008). Green sturgeon likely inhabit these estuarine and marine waters to feed and to optimize growth (Moser and Lindley 2007). Particularly large aggregations of green sturgeon occur in the Columbia River estuary and Washington estuaries and include green sturgeon from all known spawning populations (Moser and Lindley 2007). Although adult and subadult green sturgeon occur in coastal marine waters as far north as the Bering Sea, green sturgeon have not been observed in freshwater rivers or coastal bays and estuaries in Alaska.

Detailed information on the natural history of green sturgeon is provided in the proposed rule to designate critical habitat (73 FR 52084; September 8, 2008) and in the final biological report (NMFS 2009a) prepared in support of this final rule.

**Summary of Comments and Responses**

We requested comments on the proposed rule to designate critical habitat for the Southern DPS of green sturgeon (73 FR 52084; September 8, 2008) and on the supporting documents (*i.e.,* the draft biological report, draft economic analysis report, and draft ESA section 4(b)(2) report). To facilitate public participation, the proposed rule and supporting documents were made available on our Southwest Region Web site (*http://swr.nmfs.noaa.gov*) and on the Federal eRulemaking Portal Web site (*http://www.regulations.gov*). Public comments were accepted via standard mail, fax, or through the Federal eRulemaking Portal. In response to requests from the public, the original 60-day public comment period was extended an additional 45 days (73 FR 65283; November 3, 2008), ending on December 22, 2008. A public workshop was held in Sacramento, CA, on October 16, 2008, and attended by 21 participants, including researchers and representatives from industries and Federal, State, and local agencies. The draft biological report and draft

economic analysis report were also each reviewed by three peer reviewers.

Thirty-nine written public comments were received on the proposed rule and supporting documents from Federal agencies, State agencies, local entities, non-governmental organizations, Tribes, and industry representatives. Seven comments generally supported the proposed rule, 29 comments did not agree with the designation of critical habitat in particular areas, and 3 comments provided additional information but did not support or oppose the proposed rule. Several commenters requested that certain particular areas or specific areas be considered ineligible for designation because they do not meet the definition of critical habitat. Several commenters also requested exclusion of areas based on economic impacts, impacts on national security, or impacts on Indian lands. Additional data were provided to inform the biological and economic analyses, as well as comments regarding the methods used in these analyses. NMFS considered all public and peer reviewer comments. A summary of the comments by major issue categories and the responses thereto are presented here. Similar comments are combined where appropriate.

**Physical or Biological Features Essential for Conservation**

*Comment 1:* Several commenters felt that the critical habitat designation is not supported by the relatively sparse data and that the physical or biological habitat features or primary constituent elements (PCE) identified for green sturgeon are too general and vague, such that no habitat would exist without them. One commenter noted that the level of detail provided on the PCEs in the supplementary information section of the proposed rule is greater than the level of detail provided in the regulatory text section of the proposed rule.

*Response:* The critical habitat designation was developed using the best available scientific data, as required by the ESA. We recognize that uncertainties exist and have noted where they occur in the final rule and supporting documents. When appropriate, we incorporated additional data provided by the public comments regarding the PCEs, the biological evaluation, and the economic analysis. The level of specificity of the PCEs was consistent with that provided in previous critical habitat designations (*e.g.,* for West coast salmon and steelhead evolutionarily significant units (ESU) and Southern Resident killer whales). In addition, specific ranges of values for the PCEs cannot be provided (*e.g.,* water flow levels, adequately low contaminant levels), because the data are not currently available and because these values may vary based on the location, time of year, and other factors specific to an area. The level of detail provided in different sections of the proposed rule differs because the regulatory text section typically provides a more brief description of the PCEs, whereas the supplementary information section typically provides a more thorough description. The supplementary information section and the supporting documents provide additional details to describe the process of the critical habitat designation and the biological and economic analyses that were conducted in support of the designation, whereas the regulatory text reports the final designation.

*Comment 2:* One commenter requested clarification regarding how acceptably low levels of contaminants would be determined on a case-by-case basis (as it pertains to the water quality and sediment quality PCEs). Specifically, the commenter asked whether case-by-case meant that this would be determined for each Permittee/Project (and if so, what would be the basis for differentiation) or by contaminant (and if so, how this would be determined and disseminated to the public).

*Response:* Consultations under section 7 of the ESA on contaminants may be conducted on a case-by-case basis for each project or by contaminant, depending on the scope of the consultation. NMFS has typically dealt with consultations for contaminants, such as pesticides, on a project-by-project basis. These consultations have generally resulted in recommended measures to avoid exposure of the listed species to the contaminants in question, for example, by spatially or temporally limiting the introduction of the contaminant into waterways occupied by the species. However, the recommended measures are site-specific and will vary depending on the site, the contaminant(s) in question, the type of use, the purpose of the project, and the species potentially affected. NMFS recently conducted two consultations on the national level with the Environmental Protection Agency (EPA) addressing the registration of pesticides containing carbaryl, carbofuran, and methomyl (NMFS 2009b) and pesticides containing chlorpyrifos, diazinon, and malathion (NMFS 2008a). In both consultations, NMFS issued a biological opinion finding that the registration of these pesticides would jeopardize the continued existence of most listed salmonids and adversely modify critical habitat. The reasonable and prudent alternatives provided to the EPA recommended labeling requirements that specify criteria for the use and application of the pesticides, including no-application buffer zones adjacent to salmonid habitat, restrictions on application during high wind speeds and when a rain storm is predicted, reporting of any fish mortalities within four days, and implementation of a monitoring plan for off-channel habitats. To the extent the alternatives minimize entry of pesticides into water bodies and result in better information, green sturgeon and other aquatic species will benefit.

*Comment 3:* One commenter provided additional information from recent studies indicating that green sturgeon are more sensitive to methylmercury and selenium (two contaminants found in sediments) than white sturgeon (Kaufman *et al.* 2008). The commenter noted that the studies were unable to determine a ''no effect'' concentration for selenomethionine for green sturgeon, a contaminant found in bays including the San Francisco, San Pablo, and Suisun bays and the Sacramento-San Joaquin Delta (hereafter, the Delta). The commenter stated that it may be unlikely that many areas will qualify as having the sediment quality PCE as it is described in the proposed rule.

*Response:* We appreciate the updated information regarding the sensitivity of green sturgeon to contaminants and have incorporated this information into the final rule and biological report. We recognize the concern expressed by the commenter that few, if any, areas have sediments free of elevated levels of contaminants (*i.e.,* levels at which green sturgeon are not negatively affected). This brings up two issues. First, whether this affects the eligibility of the specific areas considered for designation. Because all of the proposed areas containing the sediment quality PCE also contained at least one other PCE, the eligibility of the specific areas is not affected. Related to this is the question of whether a PCE can be considered to exist within an area if it has been altered and degraded by past, current, or ongoing activities. The ESA's definition of critical habitat focuses on PCEs that may require special management considerations or protection. Thus, the ESA recognizes that the PCEs may exist at varying levels of quality and allows for the consideration of PCEs that have been or may be altered or degraded. Second, this brings up the question of how this PCE will be addressed in consultations under section 7 of the ESA. The

specifics of each consultation would vary depending on each project, but would likely focus on measures to control the introduction of selenium into the environment. The Sacramento River basin is naturally very low in selenium and little selenium enters the watercourses from the surrounding watershed. Conversely, the San Joaquin River basin, due to the geology of the west side of the valley and the human agricultural practices conducted in this region, create conditions of elevated selenium in the waters of the basin draining the west side and running through the valley floor towards the Delta. It should also be recognized that selenium is a micronutrient which is necessary for life, though toxic at levels above trace amounts. Continued monitoring of selenium levels in sediments and research on the sensitivity of green sturgeon to this and other contaminants would be supported.

**Geographical Area Occupied by the Species**

*Comment 4:* One commenter stated that the range of the Southern DPS needs to be clarified as previous publications in the **Federal Register** do not clearly define the range. Another commenter stated that the final decision to list the Southern DPS as threatened under the ESA only applied the listing to the population in California and that, although Southern DPS green sturgeon move into the Northern DPS' range outside California, the protections under the listing do not apply to Southern DPS fish once they enter the Northern DPS' range. The commenter felt that NMFS should not designate Oregon and Washington rivers and marine waters as critical habitat if the species is not listed in these areas.

*Response:* We acknowledge that in the final listing rule and the corresponding regulatory language at 50 CFR 223.102(a)(23), it is stated, ''Where listed: USA, CA. The southern DPS includes all spawning populations of green sturgeon south of the Eel River (exclusive), principally including the Sacramento River green sturgeon spawning population.'' This statement limits the listing to the Southern DPS of green sturgeon, but does not limit the geographic range to which the listing applies. A Southern DPS green sturgeon is defined to originate from spawning populations south of the Eel River (*i.e.,* from the Sacramento River). Each individual Southern DPS fish carries the listing, and the protections afforded to it under the ESA, wherever it goes. In other words, a Southern DPS green sturgeon is listed as threatened and protected under the ESA no matter where that individual is found. Thus, Southern DPS green sturgeon are listed throughout their range, including waters north of California within the range of the Northern DPS.

NMFS recognizes that previous publications in the **Federal Register** have defined the range of Southern DPS green sturgeon with varying levels of specificity and that this may have resulted in confusion. The range of the Southern DPS is more clearly defined in the proposed critical habitat rule and in the draft biological report (NMFS 2008b). We restate this definition here to further clarify the definition and range of the Southern DPS of green sturgeon. The proposed critical habitat rule (73 FR 52084, September 8, 2008) and the draft biological report (NMFS 2008b) define the Southern DPS as consisting of populations originating from coastal watersheds south of the Eel River, with the only confirmed spawning population in the Sacramento River. The Northern DPS consists of populations originating from coastal watersheds northward of and including the Eel River, with the only confirmed spawning populations in the Klamath and Rogue rivers. Thus, the Northern DPS and the Southern DPS of green sturgeon are defined based on their natal streams. However, the ranges of the Northern DPS and Southern DPS are defined by the distribution of each DPS including and beyond their natal waters. Based on genetic information and telemetry data from tagged Southern DPS green sturgeon, the occupied geographic range of the Southern DPS extends from Monterey Bay, CA, to Graves Harbor, AK. Within this geographic range, the presence of Southern DPS green sturgeon has been confirmed in the following areas: Sacramento River, CA; lower Feather River, CA; lower Yuba River, CA; the Sacramento-San Joaquin Delta, CA; Suisun Bay, CA; San Pablo Bay, CA; San Francisco Bay, CA; Monterey Bay, CA; Humboldt Bay, CA; Coos Bay, OR; Winchester Bay, OR; Yaquina Bay, OR; the lower Columbia River and estuary; Willapa Bay, WA; Grays Harbor, WA; the Strait of Juan de Fuca, WA; Puget Sound, WA; and Graves Harbor, AK (*see* final biological report (NMFS 2009a) for references for each area). Northern DPS and Southern DPS green sturgeon co-occur across much of their occupied ranges, are not morphologically distinguishable, and, based on the best available data at this time, do not appear to differ in temporal or spatial distribution within areas where their ranges overlap. Thus, within areas where the Southern DPS has been confirmed, protections for the Southern DPS would apply to all green sturgeon based on similarity of appearance. The critical habitat designation recognizes not only the importance of natal habitats, but of habitats throughout their range for the conservation of Southern DPS green sturgeon.

*Comment 5:* One commenter stated that the genetic analysis does not provide sufficient information to determine the presence or absence of Southern DPS green sturgeon in the bays and estuaries on the Oregon coast.

*Response:* To determine the presence of Southern DPS green sturgeon in an area, a critical habitat review team (CHRT), comprised of 9 Federal biologists from various agencies, primarily relied on the best available information from tagging studies. Monitoring of tagged Southern DPS green sturgeon has confirmed their use of several coastal bays and estuaries from Monterey Bay, California, north to Puget Sound, Washington (Moser and Lindley 2007; Lindley *et al.* 2008; pers. comm. with Steve Lindley, NMFS, and Mary Moser, NMFS, February 24–25, 2008). Therefore, presence has already generally been established based on the tagging data. The available genetic data supports the tagging data by assigning or confirming the DPS of individuals (*e.g.,* assigning individuals caught in non-natal waters to the Northern DPS or Southern DPS) and has also been useful in estimating what proportion of green sturgeon observed in non-natal estuaries belong to the Southern DPS. In addition, the genetic data would provide supplemental presence information once the data set is large enough to ensure detection of Southern DPS fish, particularly if the estuary or bay has a low frequency of use.

*Comment 6:* One commenter requested that additional telemetry data regarding green sturgeon use of coastal marine waters at Siletz Reef and Seal Rock Reef off the coast of Oregon be incorporated into the final biological report and considered in the final critical habitat designation. The commenter also requested that additional information be included to support the designation of coastal marine waters from 0 to 20 m depth and from 90 to 110 m depth.

*Response:* NMFS is currently analyzing the data on green sturgeon detections off the Oregon coast. Preliminary results indicate that green sturgeon use deeper depths (between 40 to 80 m) more than shallower depths, but reasons for this observation are not known. Detection data for shallower depths may be affected by noise. However, because these data represent

only two areas along the Oregon coast, it may not be appropriate to extrapolate these observations to other areas along the West coast. Other available data indicate that green sturgeon occur throughout all depths from 0 to 110 m depth. Some green sturgeon have been caught deeper than 110 m depth, but the majority occur in waters shallower than 110 m depth (Erickson and Hightower 2007).

**Specific Areas**

*Comment 7:* Two commenters felt that the areas proposed for designation as critical habitat were too broad. One commenter stated that NMFS failed to show that the areas are essential for conservation of the Southern DPS. Another commenter suggested that the areas be refined based on the spatial and temporal presence of the PCEs. For example, the commenter stated that riverine areas designated as critical habitat for spawning purposes should be designated only if actually used for spawning and only during the time of year that spawning occurs, because areas spatially or temporally outside of this would not contain the PCEs for spawning. The commenter stated that such refinement would help ensure that the designation is not applied in an overly restrictive manner to activities that occur in areas where no green sturgeon spawn and that this reasoning can be applied to other PCEs and habitat uses.

*Response:* The joint NMFS/U.S. Fish and Wildlife Service (USFWS) regulations regarding the designation of critical habitat focus on the primary biological or physical constituent elements (PCEs) that are essential to the conservation of the species. The ESA states that an area qualifies as critical habitat if it is occupied and has one or more PCE(s) that may require special management considerations or protection. Specific areas are eligible for designation if they meet these criteria. Neither the ESA definition of critical habitat nor the joint NMFS/USFWS regulations require that critical habitat be designated only within the most important core habitats of the species.

In addition, the ESA focuses on the spatial presence of the PCEs, but does not mention the temporal presence of the PCEs. The level of refinement described by the commenter is typically considered during the consultation process under section 7 of the ESA, not during the critical habitat designation process. Consistent with ESA section 7 consultation practices, spatial and temporal considerations are commonly assessed during the impact analysis of the proposed action. While temporal considerations generally look at impacts to individual fish (*i.e.,* avoidance of exposure as inferred by work windows), actions can, and often do, affect the habitat that fish use or occupy after the action is completed. The commenter's example of spawning areas does not address what potential impacts the ''action'' may have on the quality of the spawning area after the action is completed. Actions that temporally avoid areas of use (*i.e.,* spawning activities on the spawning grounds) during the implementation of the action may still impact the use of the area after the action is completed. For example, installing bridge piers upstream of a spawning area still impacts the spawning area after-the-fact through road runoff entering the river channel from the bridge, traffic vibrations being transmitted through the column into the substrate of the river channel during ''normal use,'' and sedimentation from roadway runoff and altered riparian habitat. Furthermore, actions that do not occur exactly in the same place as the area of concern may nonetheless still affect the area of concern. For example, wastewater discharge upstream of a spawning area can generate an effluent plume that travels downstream to spawning areas, and reservoir releases occurring upstream may affect water flow, velocity, and temperature in the area of concern. Thus, details such as the specific activities being conducted, the location, and the spatial and temporal scale are considered in order to determine the potential effects of the activity on critical habitat and, ultimately, whether the activity is likely to destroy or adversely modify critical habitat. Then a determination is made of what, if any, additional actions or modifications to the proposed action will need to be implemented to provide protection to the species and their designated critical habitat. The section 7 consultation process allows NMFS to address the action's impacts on a case-by-case basis and incorporate the appropriate level of analysis as needed. A categorical exemption would not allow this level of review to occur and in fact would diminish the ability to consistently and accurately assess action impacts and adjust actions to fit the current status of the species and the condition of the critical habitat used by the species.

*Comment 8:* One commenter suggested that the shoreward boundary for coastal marine habitats should extend to the line of mean lower low water (MLLW) instead of extreme high tide, and that the seaward boundary of 110 m depth should be rounded to the 60 fm contour line.

*Response:* The CHRT, a team of Federal biologists who conducted the biological analysis, considered and agreed with the recommendations. The area between the MLLW line and the extreme high tide line along the coast is small and likely not occupied by green sturgeon. Whereas studies indicate that intertidal zones within estuaries and protected bays are important habitat for green sturgeon, green sturgeon likely do not occupy shallow intertidal areas or high energy surf zones along the open coast. The CHRT compared the MLLW line along the coast with the extreme high tide line and found that the area that would be excluded by defining the shoreward boundary using the MLLW line would be small and would not contain any areas identified to be important for green sturgeon. Thus, the CHRT agreed to extend the coastal marine areas to the area inundated by mean lower low water, rather than to the extreme high tide. The CHRT also agreed to round the 110 m depth contour line to the 60 fm contour line, because the 60-fm contour is already described in Federal regulations for the West Coast groundfish bottom trawl fishery and is approximately equal to 110 m (60 fm = 109.7 m).

*Comment 9:* Several comments were received regarding the proposed designation of the lower Columbia River estuary. The commenters felt that the geographic definition of the estuary used was too broad and that the boundary for the estuary in the lower Columbia River should be defined by the maximum extent of saltwater intrusion, which was defined by one commenter to occur at RKM 64 and another commenter to occur at RKM 74. The commenters recommended that the Willamette River and the lower Columbia River from RKM 64 or RKM 74 to Bonneville Dam should be excluded from the designation. One commenter asserted that there are no data indicating that green sturgeon captured above Columbia RKM 64 are part of the Southern DPS, and that because recent green sturgeon tagging data indicate that Northern DPS green sturgeon occupy more interior habitats in the Columbia River estuary than Southern DPS green sturgeon, a smaller critical habitat area for the Columbia River estuary is justified.

*Response:* In the proposed rule, the specific area in the lower Columbia River estuary was defined as the area from the river mouth to the Bonneville Dam (RKM 146). The CHRT considered the comments received and agreed that this specific area should be divided into

two specific areas as follows: (1) The lower Columbia River estuary from the river mouth to RKM 74; and (2) the lower Columbia River from RKM 74 to the Bonneville Dam (RKM 146). This division was based on differences in environmental parameters and green sturgeon use and presence between the lower estuary (river mouth to RKM 74) and the lower river (RKM 74 to Bonneville Dam). River kilometer 74 marks the approximate location of the maximum extent of saltwater intrusion into the lower Columbia River and has been used in other reports as the location to divide the lower estuary and tidal freshwater (Johnson *et al.* 2003). Commercial gillnet harvest data for green sturgeon from 1981–2004 (Washington Department of Fish and Wildlife (WDFW) 2007, ESA informal consultation) indicate the greatest numbers of green sturgeon catch in zone 1 (RKM 1–32; 29,124 green sturgeon harvested) and zone 2 (RKM 32–84; 8,082 green sturgeon harvested). Green sturgeon catch declines sharply upstream of RKM 84, with a total of 290 green sturgeon caught in zones 3–5 (RKM 84–227) from 1981–2004. Observations by WDFW and Oregon Department of Fish and Wildlife (ODFW) also indicate concentrations of green sturgeon in the lower estuary with fewer numbers moving upstream. Unpublished telemetry data support these observations, showing greater numbers of detections of both Southern DPS and Northern DPS green sturgeon in the lower portion of the estuary compared to the upper portion (pers. comm. with Mary Moser, NMFS, February 25, 2009). However, because the most upstream monitor location is at RKM 74, the telemetry data provide data on the distribution of tagged Southern DPS and Northern DPS fish within the lower estuary but do not provide data on the movement and distribution of tagged green sturgeon upstream of RKM 74. Tagged Southern DPS green sturgeon have been detected at the monitor at RKM 74 and are able to access the lower Columbia River upstream of RKM 74, though data are not available to determine the number of Southern DPS green sturgeon moving upstream of RKM 74 or the relative levels of Southern DPS and Northern DPS fish in this area. Based on information provided in the public comments indicating that green sturgeon have not been observed in the lower Willamette River, the CHRT agreed that the Willamette River should not be included in the areas considered for designation. Thus, the specific area delineated in the lower Columbia River from RKM 74 to the Bonneville Dam does not now include the Willamette River. The CHRT's evaluation of the two specific areas resulted in a conservation value rating of High for the lower Columbia River estuary from the river mouth to RKM 74 and a conservation value rating of Low for the lower Columbia River from RKM 74 to RKM 146 (*see* response to Comment 14 and the section titled ''Methods for Assessment of Specific Areas'' for an explanation of how the conservation value ratings were determined). The final biological report (NMFS 2009a) provides additional information about the CHRT's evaluation of each specific area.

*Comment 10:* One commenter recommended that South San Francisco Bay be considered a separate area from Central San Francisco Bay and that South San Francisco Bay should be excluded from the designation because use of the area by green sturgeon is moderate and it is not needed for any life history stage that is not supported by the northern reach of the Bay.

*Response:* The CHRT acknowledged that Central San Francisco Bay and South San Francisco Bay can be distinguished by different environmental and oceanographic features. However, these differences likely do not affect green sturgeon use of the areas. The best available catch data for the San Francisco Bay indicate that comparably low numbers of green sturgeon have been caught in both Central and South San Francisco Bay. In 2006, a local sport fishing group reported 2 green sturgeon caught in Central San Francisco Bay, 3 caught in South-Central San Francisco Bay, and 4 caught in South San Francisco Bay (pers. comm. with Pete Davidson, Coastside Fishing Club, May 31, 2006). The total green sturgeon catch in the sport fishery for 2006 is not known, because sturgeon report cards were not required in California until March 2007 (Gleason 2007). Low numbers of green sturgeon were caught in CDFG's otter trawl (1980 to 2004) and midwater trawl (1980 to 2001) surveys in the bays and the Delta (Delta: n = 19; Suisun Bay/Carquinez Strait: n = 27; San Pablo Bay: n = 9; Central San Francisco Bay: n = 8; South San Francisco Bay: n = 2) (Jahn 2006). It is important to note that the surveys and sampling gear were not designed to target green sturgeon, and thus the data may not be truly representative of the relative levels of green sturgeon use among the bays and the Delta. For example, given that all green sturgeon must migrate through Central San Francisco Bay in their migrations to and from the ocean, much larger numbers of green sturgeon catch would be expected in this area. In addition, the catch data do not provide information about the distribution of juvenile green sturgeon throughout the bays and the Delta. Based on the best available information, juvenile green sturgeon are believed to distribute widely throughout the bays and Delta for feeding and rearing and are present in all months of the year (Ganssle 1966, CDFG 2002, Bay Delta and Tributaries Project 2005). Thus, the CHRT determined that the best available information does not support dividing the specific area in San Francisco Bay into Central San Francisco Bay and South San Francisco Bay, and reconfirmed that this specific area has a High conservation value for the Southern DPS (*see* response to Comment 14 and the section titled ''Methods for Assessment of Specific Areas'' for an explanation of how the conservation value ratings were determined). Based on the CHRT's assessment of San Francisco Bay, NMFS determined that this area should be included in the final critical habitat designation. Studies focused on green sturgeon, particularly on the juvenile life stages, would help address the data gaps and inform ESA section 7 consultations resulting from this critical habitat designation as well as future revisions to the designation.

*Comment 11:* One commenter recommended consideration of Nehalem Bay, Oregon, as a specific area and designation of critical habitat in Tillamook Bay, Oregon. Sport fish catch from 1986 to 2007 indicate that 279 green sturgeon were taken in the fishery in Tillamook Bay (corrected catch data provided via pers. comm. with Mary Hanson, ODFW, July 16, 2009). The habitat in Tillamook Bay is comparable to other Oregon Bays and estuaries, and genetic analyses have not excluded the presence of southern DPS green sturgeon. Nehalem Bay was not considered in the designation and had a sport fish catch record of 254 green sturgeon from 1986 to 2007 (corrected catch data provided via pers. comm. with Mary Hanson, ODFW, July 16, 2009). Another commenter stated that a tagged Southern DPS green sturgeon was detected in Yaquina Bay, Oregon, in May 2006 and recommended that the biological report be revised to state that the presence of the Southern DPS in this area is confirmed.

*Response:* Based on the additional green sturgeon catch and telemetry data provided by the commenters, the CHRT added Nehalem Bay as a new specific area to be considered and re-evaluated Tillamook Bay and Yaquina Bay. The

CHRT assigned Nehalem Bay a Medium conservation value rating based on the large number of green sturgeon captured from 1986 to 2007 and its location between Tillamook Bay and the Columbia River. The CHRT also assigned Tillamook Bay a Medium conservation value rating (compared to its previous Low conservation value rating), based on the large number of green sturgeon captured in this bay from 1986 to 2007 and information indicating that Tillamook Bay contains suitable depths for green sturgeon. The CHRT assigned Yaquina Bay a Low conservation value rating, which was the same rating given previously. The CHRT then considered whether Southern DPS presence has been confirmed within the areas. If Southern DPS green sturgeon presence is likely, but not yet confirmed, the conservation value rating was reduced by one level. Because Southern DPS green sturgeon have not yet been confirmed in Nehalem Bay and Tillamook Bay, the conservation value ratings were reduced to Low. Because Southern DPS green sturgeon have been confirmed in Yaquina Bay, the conservation value rating stayed at Low and was not reduced to Ultra-Low. These ratings were then used as the final conservation value ratings for the areas. The final biological report provides more information about the CHRT's evaluation of Nehalem Bay and re-evaluation of Tillamook Bay and Yaquina Bay. Ultimately only Tillamook Bay was excluded because the benefits of exclusion outweigh the benefits of designation.

*Comment 12:* Two commenters felt that the Umpqua River may warrant designation because green sturgeon occur in this river, and it was identified as a potential spawning river in the 2005 status review.

*Response:* The CHRT evaluated Winchester Bay, the estuary at the mouth of the Umpqua River, as a specific area eligible for designation as critical habitat. The Southern DPS consists of green sturgeon originating from coastal watersheds south of the Eel River, CA (currently, the only confirmed spawning river is the Sacramento River, CA). The Northern DPS consists of green sturgeon originating from coastal watersheds north of and including the Eel River, CA (confirmed spawning rivers are the Klamath River, CA, and Rogue River, OR). As described in the proposed rule and biological report, NMFS defined the Southern DPS' occupied range to include coastal bays and estuaries upstream to the head of the tide in areas north of and including the Eel River. In waters north of and including the Eel River, green sturgeon occurring upstream of the head of the tide are presumed to belong to the Northern DPS because it is unlikely that Southern DPS green sturgeon would venture further into non-natal streams beyond the head of tide. Thus, green sturgeon observed in the Umpqua River upstream of the head of tide are presumed to be Northern DPS fish. Genetic analyses have confirmed the presence of Southern DPS green sturgeon in Winchester Bay and Umpqua River, but the tissue samples were collected downstream of the head of tide on the Umpqua River (between RKM 6.4 and 19.3). Thus, the available genetic data also do not provide information on the presence of Southern DPS green sturgeon in the Umpqua River upstream of the head of tide (pers. comm. with Josh Israel, University of California, Davis (UC Davis), July 10, 2009). The Umpqua River was therefore not identified as an area occupied by the Southern DPS.

*Comment 13:* One commenter felt that Chinook salmon should be used as a surrogate species in place of white sturgeon, because green sturgeon do not have populations that are isolated from the sea. The commenter presented a Chinook salmon-based conceptual model for the life history of green sturgeon in San Francisco Bay, which indicated that, like Chinook, juvenile green sturgeon most likely migrate from the San Francisco Bay as soon as possible to coastal marine waters where food is abundant for feeding and growth.

*Response:* The CHRT considered the Chinook salmon-based conceptual model. The CHRT noted that, while green sturgeon may share some similarities with Chinook salmon with regard to habitat use and needs, the best available data indicate there are several important differences between the life history and distribution of green sturgeon and Chinook salmon that limit the application of the Chinook salmon-based conceptual model to green sturgeon. Unlike Chinook salmon, green sturgeon will transit through the San Francisco Bay and Delta complex several times during their lifetime. Laboratory studies indicate that Chinook salmon juveniles may occupy fresh to brackish waters at any age, but do not completely transition to salt water until about 1.5 years of age. Studies in the Klamath River show that juvenile green sturgeon rear in fresh and estuarine waters for 1 to 4 years before dispersing into salt water, at lengths of about 300 to 750 mm. Although there have been few studies on juvenile green sturgeon distribution throughout the San Francisco Bay, the available data indicate that juvenile green sturgeon also rear in the area's bays and estuaries for 1 to 4 years before migrating out to coastal marine waters as subadults. Residence times in the Delta appear to be variable, based on the temporal frequency of juvenile fish recovered at the fish salvage facilities of the Central Valley Project and State Water Project and the data collected from both the 2007 and 2008 sturgeon report cards from CDFG (Gleason 2008). Green sturgeon can be found in any month of the year, and apparently multiple year classes are present in the Delta based on the size distribution of catches, although for green sturgeon few fish were actually measured (sizes ranged from 12 inches to 68 inches, 19 fish measured out of 240 reported caught; Gleason 2008). Based on the 2008 report cards, adult green sturgeon were caught by sport fishermen in every season of the year in the Delta and in the Sacramento River (from Rio Vista to Chipps Island and from Red Bluff to Colusa). This year-round presence of adult and juvenile green sturgeon in the Central Valley differs from the typical Chinook salmon life history as described by the commenter's conceptual model, in which juveniles rear in freshwater prior to migrating to the San Francisco Bay estuary, through which they move rapidly to get to marine waters, where conditions are better for feeding and growth. In addition, subadult and adult green sturgeon migrate throughout the West coast from southern California to Alaska, and are known to occupy oversummering habitats in coastal bays and estuaries from northern California to Washington (including Humboldt Bay, Coos Bay, Winchester Bay, the lower Columbia River estuary, Willapa Bay, and Grays Harbor) for weeks to months to feed during multiple summers over the course of their lives. In contrast, Chinook salmon generally use estuaries only at the beginning and end of their ocean residence (Quinn 2005). Unlike green sturgeon, they spend their summers in the ocean and do not rely nearly as heavily on estuarine habitats over their lifespans.

**Biological Evaluation of Conservation Value**

*Comment 14:* One commenter stated that the qualitative approach used by the CHRT to assess the biological conservation benefits of designation was not adequate because the approach did not provide an objective estimate of the relative conservation benefit of including a specific area or a clear standard to compare with the estimated economic impacts. The commenter

noted that the approach did not contain an estimate of the species' current population level, the increase in survival or abundance expected from the designation of critical habitat, or an estimate of the economic or monetary value of the conservation benefits.

*Response:* The ESA requires that a critical habitat designation be based on the best available scientific data. Data are not available regarding the current absolute population abundance of the Southern DPS or green sturgeon in general. Data are also not available to estimate the monetary value of the conservation benefits of designation and thereby make a direct comparison to the economic impacts of designation. In the absence of these data, a qualitative conservation value rating approach was developed to evaluate the conservation benefits of designation. The approach incorporated the best available data and allowed for consideration of the best professional judgment of the CHRT. The conservation value ratings (High, Medium, Low, Ultra-low) provided a relative measure of the benefits of designation for each specific area, at a level appropriate for the level of data available. This approach has been used in critical habitat designations for salmonids and has been recognized as an appropriate alternative where data are not available to monetize the benefits of designation.

*Comment 15:* One commenter recommended that further evaluation of whether green sturgeon use particular coastal estuaries and their habitat value be conducted prior to designation of these areas as critical habitat. The commenter focused on the coastal estuaries considered for designation in Oregon, stating that the proposed rule did not provide information regarding the use or extent of use by green sturgeon in these areas or the habitat value of these areas to green sturgeon. Specifically, the commenter stated that: (1) The genetic analyses do not provide sufficient information to determine the presence of Southern DPS green sturgeon in Winchester Bay and more sampling is needed; (2) it is not clear whether tissue samples collected for genetic analyses were taken from green sturgeon in Winchester Bay or in the Umpqua River and the results regarding the proportion of Southern DPS green sturgeon in the area may be affected by sample size; (3) it is not clear why the Rogue River was excluded, but Coos Bay was not; and (4) reasons for the designation of Yaquina Bay and the exclusion of Tillamook Bay and the Siuslaw River estuary are not clear.

*Response:* We agree that additional studies are needed to address information gaps regarding the extent of use of coastal estuaries by Northern DPS and Southern DPS green sturgeon and to better understand the habitat function and value of these areas for the species. However, the ESA requires that NMFS use the best available scientific and commercial data to designate critical habitat within specific statutory timelines. Thus, in the face of uncertainty and varying levels of information available for different areas, NMFS relied on the best available information and used its best professional judgment where data were lacking or uncertainty was great.

To evaluate specific areas considered for designation as critical habitat, the CHRT considered both the use of each area by green sturgeon and the value of the habitat to green sturgeon. Specifically, the CHRT evaluated the presence and condition of the PCEs, the habitat functions provided, and the life stages of green sturgeon confirmed or most likely to occur there. To confirm the presence of the PCEs, the CHRT used the presence of green sturgeon, along with the best available habitat data. To evaluate the relative habitat value of each area, the CHRT considered the abundance of green sturgeon along with the best available data on the life stages and uses supported, the consistency of use, and the temporal and spatial distribution of green sturgeon within an area. To determine the extent to which Southern DPS green sturgeon used an area, and the relative value of each area to the Southern DPS, the CHRT used the best available tagging and genetic data. The CHRT's analyses and the data used are summarized in this final rule and described in greater detail in the final biological report (NMFS 2009a). In the following paragraph, we summarize the relevant information in response to the comments on specific coastal estuaries in Oregon.

First, the presence of Southern DPS green sturgeon within coastal estuaries in Oregon was primarily confirmed by telemetry data and supported by genetic data, where available. For Winchester Bay, genetic tissue samples were collected between RKM 6.4 and 19.3, which is downstream of the head of tide in Umpqua River (head of tide = RKM 40) and within the boundaries of the specific area delineated for the bay (pers. comm. with Josh Israel, UC Davis, July 10, 2009; pers. comm. with Pete Baki, ODFW, July 17, 2009). It is possible that the sample size affected the analysis of the proportion of Southern DPS green sturgeon in the bay, but that does not negate the use of these data to confirm the presence of Southern DPS fish in this area. The CHRT assigned Winchester Bay a Medium conservation value rating based on high use of the area by green sturgeon and the presence of suitable habitat features (*see* final biological report, NMFS 2009a).

Second, certain coastal estuaries in Oregon were excluded from the designation because the economic benefits of exclusion outweighed the conservation benefits of designation. Coastal estuaries in Oregon are primarily occupied by green sturgeon during the summer and contain PCEs (including prey resources, water quality, and migratory corridors) that support feeding and aggregation of subadult and adult green sturgeon. During the public comment period, additional data were provided by the ODFW regarding green sturgeon sport catch records in coastal Oregon estuaries. These data were used to update the data reported in the draft biological report (NMFS 2008b). The data were considered by the CHRT and incorporated into the final rule and biological report (*see* response to Comment 11). The data indicate that from 1986 to 2007, the largest numbers of green sturgeon were caught in Winchester Bay (n = 1,889), Tillamook Bay (n = 279), and Nehalem Bay (n = 254), followed by Coos Bay and Yaquina Bay (n = 201) (ODFW 2009a, b). Southern DPS green sturgeon tagged in the Sacramento River and San Pablo Bay have been detected in Coos Bay, Winchester Bay, and Yaquina Bay (pers. comm. with Steve Lindley, NMFS, and Mary Moser, NMFS, February 24–25, 2008; pers. comm. with Dan Erickson, ODFW, September 3, 2008). The CHRT initially assigned a Medium conservation value to Winchester Bay, Coos Bay, Tillamook Bay, and Nehalem Bay, based on data indicating consistent use by and relatively large numbers of green sturgeon in these estuaries. However, the conservation value for Tillamook Bay and Nehalem Bay was reduced by one level to Low, because there was no evidence to confirm that any green sturgeon in those areas belong to the Southern DPS. Although Southern DPS presence has been confirmed in Yaquina Bay, the CHRT assigned the area a Low conservation value (NMFS 2009a). Finally, the estuaries at the mouths of the Siuslaw and Alsea rivers were assigned a Low conservation value based on relatively low numbers of green sturgeon recorded in the sport catch data (sport catch = 50 green sturgeon in Siuslaw estuary and 30 green sturgeon in Alsea estuary from 1986 to 2007; ODFW 2009a, b). The conservation value was reduced to an

Ultra-low because we lack data to confirm the presence of Southern DPS green sturgeon in these estuaries.

Under section 4(b)(2) of the ESA, NMFS has the discretion to exclude an area from the designation if the benefits of exclusion outweigh the benefits of designation. Tillamook Bay, Siuslaw River estuary, Alsea River estuary, Coos Bay, and the Rogue River estuary were all determined to be potentially eligible for exclusion under ESA section 4(b)(2) based on economic impacts. All of these, except for Coos Bay, were excluded based on NMFS' determination that the economic benefits of exclusion outweighed the conservation benefits of designation. Although data demonstrate that the Rogue River estuary is consistently used by large numbers of green sturgeon, the area was assigned an Ultra-Low conservation value because the best available data indicate that the green sturgeon observed there belong to the Northern DPS. Thus, the designation of critical habitat in the Rogue River estuary would not likely benefit the conservation of the Southern DPS. Coos Bay was not excluded, because the data indicate consistent use by relatively large numbers of green sturgeon that include Southern DPS fish. The CHRT determined that protection of Coos Bay as critical habitat is important for the conservation of green sturgeon, and exclusion of Coos Bay would significantly impede conservation. Based on the CHRT's recommendation, NMFS determined that the economic benefits of exclusion do not outweigh the conservation benefits of designation for Coos Bay and included Coos Bay in the final critical habitat designation. We recognize that the level of data available varies across areas and may affect the evaluation of these areas. We encourage additional studies of green sturgeon distribution in, and use of, coastal estuaries to inform NMFS' consultations under section 7 of the ESA, recovery planning and implementation, and future revisions to the critical habitat designation for the Southern DPS.

*Comment 16:* One commenter noted that many of the coastal marine and estuarine areas proposed for designation as critical habitat are already altered habitats, wanting NMFS to recognize that routine, regular maintenance activities (including maintenance dredging of navigation channels) are conducted within these areas by the U.S. Army Corps of Engineers to support ongoing multi-purpose projects.

*Response:* NMFS acknowledges that many of the coastal marine and estuarine areas proposed for designation as critical habitat contain habitats that have been altered by past and ongoing activities. These past and ongoing activities have likely affected the PCEs within each area, but have not degraded the PCEs such that they no longer exist within the areas. The continued presence and use by green sturgeon of each area indicate that the PCEs exist and still provide habitat functions to support the species. In addition, the presence of regular routine maintenance indicates that the PCEs within the coastal marine and estuarine areas may require special management considerations or protection.

*Comment 17:* One commenter noted that the proposed rule incorrectly stated that green sturgeon present in estuaries of the Eel, Klamath/Trinity, and Rogue rivers are believed to belong to the Northern DPS, based on the fact that these are spawning rivers for the Northern DPS (73 FR page 52091, bottom of third column). The commenter requested clarification that green sturgeon spawning has not been confirmed in the Eel River.

*Response:* We acknowledge this error in the proposed rule. The final rule corrects this error and states that green sturgeon present in estuaries of the Klamath/Trinity and Rogue rivers are presumed to belong to the Northern DPS because these are spawning rivers for the Northern DPS and no tagged Southern DPS green sturgeon have ever been detected in the estuaries. Green sturgeon in the Eel River estuary are presumed to belong to the Northern DPS based on the definition of the Northern DPS (which includes the Eel River). In 2008, a hydroacoustic array was installed in the Eel River estuary and detected one tagged Northern DPS green sturgeon. More data from tagging and genetics studies are needed to confirm whether or not Southern DPS green sturgeon occupy the Eel River estuary.

*Comment 18:* Commenters requested additional information to be presented in the biological report, including: A table citing the references used to determine the presence of green sturgeon in each specific area; the results from the CHRT's three approaches for evaluating the conservation value of the species areas; and additional telemetry data and references provided by reviewers and commenters. Two commenters also noted an error in Table 5 of the draft biological report regarding the tally of conservation value rating votes for Grays Harbor, WA.

*Response:* The final biological report incorporates the changes requested and the additional information provided by the peer reviewers and public comments. First, a table listing each specific area, the life stages of green sturgeon that are present, and the relevant references was added to the report. Second, the CHRT had used three different approaches for assigning conservation values to the specific areas, but only the results of the final method were reported in the draft biological report. The final biological report provides the results for all three approaches for comparison. Third, additional telemetry data and information regarding green sturgeon spawning in the Sacramento River were incorporated into the report and considered by the CHRT. Finally, corrections were made to the conservation value rating tally for Grays Harbor in Table 7 of the final biological report (formerly Table 5 in the draft biological report). Specifically, the draft biological report incorrectly reported 6 votes for Medium and 2 votes for Low conservation values. The correct tally was 6 votes for High and 2 votes for Medium conservation values.

**Special Management Considerations**

*Comment 19:* One commenter stated that most of the 13 types of activities that potentially require special management are already regulated under existing environmental regulations that address effects on the PCEs. The commenter requested additional information to describe the cause/effect relationship between the PCEs and each of the 13 types of activities that potentially require special management.

*Response:* This comment raises the concern of whether the specific areas considered for designation as critical habitat are eligible for designation. To be eligible for designation, the specific area must meet the definition of critical habitat. That is, the specific area must contain at least one PCE that may require special management considerations or protection. The focus of this comment is on whether the ''special management considerations or protection'' criterion is satisfied. Special management considerations or protection mean ''any methods or procedures useful in protecting physical and biological features of the environment for the conservation of listed species'' (50 CFR 424.02). In determining whether a specific area met the definition of critical habitat, the CHRT was asked to identify whether any PCE could be found in the specific area, whether there were any actions (either ongoing or anticipated) occurring in the area that may threaten the PCE(s), and whether there would be any methods or procedures useful in protecting the PCE(s). The CHRT based

their assessment on their knowledge of the areas and the PCEs and their experience conducting section 7 consultations or field research on green sturgeon in the areas. The CHRT was not asked to identify existing protections within each area, nor was the CHRT asked to evaluate whether existing protections were adequate. The existence of environmental regulations does not negate the fact that the PCEs within an area may require special management considerations or protection. Thus, the existence of environmental regulations that already regulate the activities of concern was not a factor to be considered by the CHRT in determining the eligibility of an area for consideration as critical habitat. Instead, the consideration of existing environmental regulations and other protections that address the PCEs is a question to be considered in the ESA 4(b)(2) analysis when weighing the benefits of exclusion against the benefits of designation. The final biological report was revised to include a more detailed description of the 13 types of activities that may require special management and how these types of activities may affect the PCEs.

*Comment 20:* One commenter recommended that gravel augmentation should not be under the ''in-water construction or alteration'' category, but should be included in the ''habitat restoration'' category because there will be potential habitat benefits from gravel augmentation. Otherwise, the commenter noted that a large number of restoration activities should also be included in the ''in-water construction or alteration'' category. The commenter requested that in-water construction or alteration activities and habitat restoration activities be more clearly defined.

*Response:* We revised the final rule and supporting documents to more clearly define in-water construction or alteration activities and habitat restoration activities. In-water construction or alteration activities include activities that involve the construction or maintenance of some physical in-water structure (*e.g.*, breakwaters, docks, piers, pilings, bulkheads, boat ramps, utility lines) or the alteration of physical in-water habitat features (*e.g.*, channel modification/diking, sand and gravel mining), including activities occurring outside of the water but that may affect in-water habitat (such as road building and maintenance, forestry, grazing, and urbanization that may lead to increased erosion and sedimentation). Habitat restoration activities are activities conducted for the primary purpose of restoring natural aquatic or riparian habitat conditions or processes. We agree that gravel augmentation can be included as a habitat restoration activity and have included it in this category in addition to the in-water construction or alteration activity category. We note, however, that gravel augmentation and other habitat restoration activities may have either positive or negative effects on critical habitat for green sturgeon, depending on the type of activity, location, time of year, scale, and other factors. For example, gravel augmentation could possibly fill in deep pools (greater than 5 meters in depth) used by green sturgeon for holding and spawning. These activities would be subject to requirements under section 7 of the ESA to address potential effects on critical habitat.

*Comment 21:* Two commenters were concerned about the effect that invasive submerged aquatic vegetation may have on the physical or biological features essential for conservation in shallow water habitats and felt that this should be considered in the designation. One commenter also requested that the CHRT consider activities that may result in a large increase of erosion, including logging, gravel mining, and the use of recreational off-road vehicles near riparian areas, and their effects on present or future spawning streams.

*Response:* The CHRT identified the introduction and spread of non-native species as a potential threat to the PCEs that may result in the need for special management considerations or protection. We recognize that invasive submerged aquatic vegetation, such as the *Egeria densa* mentioned by one commenter, may affect shallow waters by trapping sediments, forming thick mats that obstruct passage, and crowding out native vegetation. Activities that result in increased erosion were also considered by the CHRT under the ''in-water construction or alterations'' category. The final rule clarifies that activities that occur outside of designated critical habitat, including those conducted upstream, upland, or adjacent to designated critical habitat areas, can destroy or adversely modify critical habitat and would also be subject to requirements under section 7 of the ESA with regard to critical habitat. Therefore, the commenters' concerns have been addressed.

*Comment 22:* Several commenters provided information on additional activities that should be considered which occur within the specific areas and that may threaten the PCEs.

*Response:* We considered the information provided on additional activities and incorporated the information into the final rule and supporting documents. The changes include: (1) Feather River—added habitat restoration activities; (2) Yolo Bypass—added dams (Lisbon Weir and Fremont Weir), water diversions, pollution, and habitat restoration; (3) Sutter Bypass—added dams (weirs located in the toe drain), water diversions, pollution, habitat restoration, and in-water construction or alteration activities; (4) Sacramento-San Joaquin Delta—added dams (locks, weirs, and temporary barriers) and commercial shipping; (5) lower Columbia River estuary (from RKM 0 to 74)—the two LNG projects identified by the commenters were already considered in the proposed rule, however, based on public comments received, we divided the lower Columbia River and estuary into two specific areas (the lower Columbia River estuary from RKM 0 to 74 and the lower Columbia River from RKM 74 to 146; *see* response to comment 15) and the LNG projects were assigned to the lower Columbia River estuary specific area; and (6) coastal marine waters off Oregon—added 5 proposed wave energy projects.

**Potential Effects of the Critical Habitat Designation on Activities**

*Comment 23:* One commenter requested that further clarification be given whether a Federal nexus exists for the commercial crab and pink shrimp State-managed fisheries that may trigger section 7 requirements. The commenter noted that consultation may also be required for bottom trawl fisheries conducted in coastal marine waters off Oregon.

*Response:* Based on the information provided by the commenters and the current management regime at this time, NMFS does not believe that a Federal nexus exists for the commercial crab and pink shrimp State-managed fishery off Oregon. However, the fishery may be subject to the ESA section 4(d) rule for the Southern DPS of green sturgeon (proposed May 21, 2009, 74 FR 23822) if take of green sturgeon occurs in this fishery. NMFS is working with the Pacific Fishery Management Council (PFMC) to prepare for a consultation under section 7 of the ESA on the groundfish bottom trawl fishery conducted off California, Oregon, and Washington. The consultation would address impacts on green sturgeon critical habitat within coastal marine waters.

*Comment 24:* Several commenters requested additional information on what changes might be recommended

for the California State Water Project (SWP) and the Central Valley Project (CVP) operations and how these areas may require special management.

*Response:* The effects of the combined CVP and SWP operations on the Southern DPS were analyzed by NMFS in the recently issued Biological and Conference Opinion (2009 OCAP BO). The most conspicuous change to CVP operations is the operations of Red Bluff Diversion Dam (RBDD). Following the issuance of the 2009 OCAP BO, gates will remain open from September 1st through June 14th until May of 2012. By May 14th, 2012, the Red Bluff alternative intake pumps are anticipated to be operational. This will allow the Tehama-Colusa Canal Authority (TCCA) to divert sufficient water through screened pumps to meet its obligations without relying on the operations of the RBDD to back up water to supply its current gravity fed diversion. The operation of the screened pumps will allow for the decommissioning and eventual removal of the RBDD. During the interim period (2009 to 2012), screened pumps will be installed adjacent to the current location of the RBDD to divert sufficient volumes of water to meet TCCA needs through June 14th of each year. After June 14th, the RBDD gates will be lowered to back up river water and supply the gravity fed diversions. When the gates are operational, a minimum of 18 inches of clearance will be maintained beneath the radial gate to allow for downstream passage of adult green sturgeon. In addition, the TCCA and the Bureau of Reclamation will fund studies over the next 3 years specifically focused on green sturgeon to determine population size, movements of fish within the system, and habitat preferences and usage within the Central Valley. Within the Delta, reoperation of the Delta Cross Channel gates will result in closing the gates earlier to prevent emigrating fish from entering the Delta interior. Although primarily designed for salmonid protection, the closing of the gates may have some utility in protecting adult and juvenile green sturgeon emigrating during the same time period (better conditions in the Sacramento River migratory corridor versus less hospitable conditions within the Mokelumne River corridor). Likewise, export curtailments designed to benefit emigrating salmonids are expected to benefit juvenile green sturgeon and reduce their entrainment by the pumps during the periods of export reduction. Modifications to the fish salvage facilities to enhance the efficiency of the overall salvage will benefit green sturgeon. Increases in sampling rate/duration at the fish salvage facilities will better quantify the effects of the export actions on green sturgeon. The section 7 consultation on the Federal Energy Regulatory Commission (FERC) relicensing of Oroville Dam is assessing the river temperature profile downstream of the Thermalito Afterbay outlet to ascertain whether additional spawning habitat can be gained through modifications of facilities, and/or operations of dam releases, or reconfiguration of the Thermalito Afterbay itself.

**Economic Analysis**

*Comment 25:* One commenter felt that NMFS cannot adequately estimate the incremental economic effects of the critical habitat designation, because NMFS has not yet issued an ESA 4(d) rule for the Southern DPS.

*Response:* The economic analysis (Industrial Economics Inc. (Indecon) 2009) complies with the ESA's mandate to use the best available information, and NMFS believes it provides a sufficient assessment of the baseline and incremental economic impacts of designating critical habitat for green sturgeon. The baseline for the incremental impacts analysis includes the estimated costs attributed to the listing of the species and the protections under section 7 of the ESA requiring Federal agencies to ensure their actions do not jeopardize ESA-listed species. The baseline also includes protections already provided to green sturgeon critical habitat under existing protections for other listed species, such as West Coast salmon and steelhead, delta smelt, and marine mammal species. The incremental analysis of impacts looks at what is required to avoid adverse modification of green sturgeon critical habitat, above and beyond what is already required to avoid jeopardy of listed species and adverse modification of existing critical habitat, and to comply with other existing Federal, State, and local protections.

To assess the baseline and incremental impacts, the best available information was used from the short consultation history for green sturgeon, as well as information from surrogate species (*e.g.*, salmonids) whose distribution and life history traits overlap with the green sturgeon's, because the protective measures that have been established for these species are similar to what NMFS would anticipate for green sturgeon. Uncertainties related to assessing incremental impacts exist, but this is partly due to the project-specific nature of the ESA section 7 consultations that NMFS conducts with other Federal agencies. To address this uncertainty, a conservative approach was taken to ensure that the analysis adequately represents the potential impacts and incremental costs associated with the critical habitat designation. Therefore, promulgation of take prohibitions under an ESA 4(d) rule is not necessary to assess the baseline and incremental impacts of the critical habitat designation.

*Comment 26:* Several commenters disagreed with the draft economic analysis' method for assessing incremental impacts. One commenter also noted the draft economic analysis did not adequately define the baseline used in the analysis. Specifically, commenters suggested that the baseline should not include protections for green sturgeon offered by conservation measures undertaken for Pacific salmon. One commenter noted that the economic analysis should consider both incremental and baseline impacts. In particular, the commenter suggested that baseline impacts should be considered because if one of the listed salmonids were delisted, the designation of critical habitat for green sturgeon could become the primary reason certain conservation measures are undertaken. Another commenter stated that NMFS' consideration of all potential project modifications that may be required under section 7 of the ESA, regardless of whether those changes may also be required under the jeopardy provision, appears to be contrary to the reasoning of the *Cape Hatteras Access Preservation Alliance* v. *U.S. Department of Interior* (344 F. Supp. 2d 108 (D.D.C., 2004)) (*Cape Hatteras*) court decision that the effects of listing and the jeopardy provision should not be considered as part of the impacts of a designation in the ESA 4(b)(2) analysis for a critical habitat designation.

*Response:* As outlined in Section 1.3 of the final economic analysis report (Indecon 2009), the analysis does not attribute all potential project modifications required under section 7 to the critical habitat designation. Rather, it takes an incremental approach, comparing the state of the world with and without the designation of critical habitat for green sturgeon. The ''without critical habitat'' scenario represents the baseline for the analysis, considering habitat protections already afforded green sturgeon under its Federal listing or under other Federal, State, and local regulations, including protections afforded green sturgeon resulting from protections for other listed species, such as West Coast

salmon and steelhead, delta smelt, and marine mammal species. The ''with critical habitat'' scenario attempts to describe the incremental impacts associated specifically with green sturgeon critical habitat designation. The courts in several cases have held that an incremental analysis is proper (*see* for example: *Cape Hatteras; Center for Biological Diversity* v. *United States Bureau of Land Management,* 422 F. Supp. 2d. 1115 (N.D. Calif. 2006); and *Arizona Cattle Growers* v. *Kempthorne,* 534 F. Supp. 2d 1013 (D. Ariz. 2008)).

Section 1.4 of the final economic analysis report clarifies how the economic analysis defines its baseline, or ''without critical habitat'' scenario. As described in Section 1.4.5 of the final economic analysis report, project-specific conservation efforts that benefit green sturgeon are frequently undertaken due to the joint presence of multiple anadromous fish species and habitats and may therefore be implemented regardless of the presence of green sturgeon critical habitat. This complicates the identification of changes in behavior associated specifically with the green sturgeon critical habitat. This analysis employs best professional judgment in calculating the probability that green sturgeon conservation needs are a primary driver of the implementation of a joint conservation effort. Thus, this analysis estimates the likelihood that consideration of green sturgeon critical habitat will weigh heavily in the implementation of a conservation effort undertaken due to the presence of multiple species and habitats. This probability is dependent upon a number of factors, including the details of the project and conservation effort in question and the number of sensitive species present. By excluding impacts for which green sturgeon critical habitat is not a key reason for a conservation effort implementation, this analysis focuses the quantification of impacts on those associated specifically with green sturgeon habitat conservation. Because the probability that any given conservation effort is being driven by green sturgeon conservation as opposed to other species is subject to significant uncertainty, the final economic analysis report presents a sensitivity analysis for these assumptions. Appendix E of the final economic analysis describes alternative results assuming the extreme case that green sturgeon is always a primary driver of the conservation efforts (*e.g.,* that 100 percent of the time fish screens are installed, it is primarily due to green sturgeon conservation needs).

*Comment 27:* Several commenters noted that it would be helpful if the draft economic analysis provided additional, detailed explanations of the methodology for calculating impacts for specific activities, including dam projects.

*Response:* Section 1.4 of the final economic analysis report provides a revised discussion of how the various cost estimates are developed and aggregated to develop total annualized impacts per unit. Every section for a specific economic activity contains exhibits on these three data points: (1) Number of affected projects by unit; (2) expected annualized costs of conservation efforts for anadromous fish species per project; and (3) the probability that green sturgeon drives the impact for that activity in that unit (for units where listed salmon and steelhead habitat overlap occurs). The analysis multiplies the number of affected projects in each unit by the annualized costs per project and the probability score for each unit to arrive at projected impacts. For example, costs of fish screens at water diversions are developed by estimating average costs of fish screens ($80,000 to $130,000), annualizing over 20 years, and multiplying by the number of water diversions in affected units. For units where listed salmon and steelhead species are present, the costs are again multiplied by the probability that green sturgeon will be the driver of passage costs. Specific costs of fish passage projects in critical habitat areas provided by public commenters have been incorporated into the analysis of impacts on dam projects.

*Comment 28:* One commenter noted that the designation of critical habitat may result in economic activities not being carried out (*e.g.,* dredging, project, in-water construction, development project) or otherwise lead to time delays. The draft economic analysis should address losses in consumer surplus resulting from these potential delays.

*Response:* As discussed in Section 1.3.2 of the final economic analysis report, the analysis does consider time delay impacts associated with the section 7 consultation process and/or compliance with other laws triggered by designation where applicable. For example, estimated impacts to dredging projects include impacts associated with possible work window constraints (*see* Exhibit 2–4).

*Comment 29:* One commenter stated that the draft economic analysis employed a ''cost-effectiveness'' analysis to analyze impacts; however, the draft economic analysis did not provide sufficient data to determine which areas would provide the greatest biological benefit for each dollar of associated impact.

*Response:* As discussed in Section 1.2.1 of the final economic analysis report, we used an alternative form of cost-effectiveness analysis for this rulemaking. This alternative form develops an ordinal measure of the benefits of critical habitat designation. Although it is difficult to monetize or quantify benefits of critical habitat designation, it is possible to differentiate among habitat areas based on their estimated relative value to the conservation of the species. For example, habitat areas can be rated as having a high, medium, or low biological value. The output, a qualitative ordinal ranking, may better reflect the state of the science for the geographic scale considered here than a quantified output and can be done with available information. The final ESA section 4(b)(2) report (NMFS 2009c) discusses the specific weighing process that we performed for this rule.

*Comment 30:* One commenter stated that the cumulative economic impact of baseline protections was not included in the economic analysis.

*Response:* The economic analysis estimates costs associated with conducting an ESA section 7 consultation to ensure Federal agency actions are not likely to destroy or adversely modify critical habitat. We did not have information available to determine the cumulative economic impacts of baseline protections, nor did the commenter provide us data that would allow us to make such a determination.

*Comment 31:* One commenter stated that although little impact is expected on the part of the Bureau of Land Management, additional review is needed to ensure that the economic analysis accurately reflects increased administrative costs associated with section 7 consultation for other Federal agencies.

*Response:* The final economic analysis report now includes an overview in section 1.3.2 of the estimated future annual administrative costs associated with section 7 consultations for green sturgeon. Based on the consultation history for completed consultations that included green sturgeon to date (2006–2009), the economic analysis forecasts an average future annual rate of section 7 consultation for green sturgeon of 12 formal consultations, 67 informal consultations, and eight technical assistance efforts. The additional, incremental administrative effort

associated with these consultations is estimated to be approximately $251,000 per year, including efforts by the Service, Action agencies, and third parties.

*Comment 32:* Several commenters stated that the economic analysis failed to consider community level impacts.

*Response:* We acknowledge that modifications to economic activities within one unit may affect economic activities in other units. The analysis also acknowledges that potential impacts could result in regional economic effects, for example in fishing communities, should the level of bottom trawl fishing catch be curtailed as a result of this designation. However, the regional economic effects of the critical habitat designation are unknown because many uncertainties exist. For example, potential reductions in fishing effort in critical habitat areas may or may not lead to reductions in profits, depending on the availability and quality of alternative sites. Therefore, the economic analysis report describes the potential regional economic effects and the uncertainties associated with their analysis, but does not quantify these effects.

*Comment 33:* One commenter thought that the draft economic analysis failed to consider energy impacts resulting from potential changes in management at the Red Bluff Diversion Dam and other water diversions. Specifically, the commenter was concerned the farmers may need to seek out replacement water supplies that may require additional energy consumption. The commenter also was concerned that permanent crop loss in some areas could lead to losses of carbon dioxide conversion and result in widespread changes in energy consumption over a wide geographic area.

*Response:* Appendix D of the final economic analysis report now presents an energy impacts analysis. This energy impacts analysis assesses whether the green sturgeon critical habitat designation would result in one of nine outcomes that may constitute ''a significant adverse effect'' as outlined by the Office of Management and Budget in their guidance on implementing Executive Order 13211. These include: (1) Reductions in crude oil supply in excess of 10,000 barrels per day; (2) reductions in fuel production in excess of 4,000 barrels per day; (3) reductions in coal production in excess of 5 million tons per year; (4) reductions in natural gas production in excess of 25 million Mcf per year; (5) reductions in electricity production in excess of 1 billion kilowatt-hours per year or in excess of 500 megawatts of installed capacity; (6) increases in energy use required by the regulatory action that exceed the thresholds above; (7) increases in the cost of energy production in excess of one percent; (8) increase in the cost of energy distribution in excess of one percent; or (9) other similarly adverse outcomes. Of these, the most relevant criteria to green sturgeon critical habitat are potential changes in natural gas and electricity production, as well as changes in the cost of energy production. Possible energy impacts may occur as the result of requested project modifications to hydropower dams, alternative energy hydrokinetic projects, and LNG facilities. The potential impacts of permanent crop loss on carbon dioxide levels in the atmosphere and the potential changes in climate and energy consumption in affected regions are unclear at this time due to many uncertainties. For example, it is uncertain what the effects of crop loss are on atmospheric carbon dioxide levels and subsequently on climate and on energy consumption by consumers. Further complicating matters is the uncertainty regarding how these relationships may be affected by other impacts on atmospheric carbon dioxide levels from activities related to or outside of this critical habitat designation. Therefore, these impacts cannot be analyzed at this time.

*Comment 34:* One commenter asked how the lost revenue figures estimated in the small business analysis related to the estimated impacts calculated in the rest of the economic report. In addition, the commenter specifically requested that the small business analysis provide information about the potential revenue losses for farmers as a share of their total revenues.

*Response:* The estimated lost revenues per small business included in the Final Regulatory Flexibility Analysis (Indecon 2009) are calculated by taking the mid-range scenario impacts presented in Chapters 3 through 5 of the final economic analysis report, and then dividing by the estimated number of small entities by activity by unit, as presented in Exhibit C–3. Average net operational dollar gain per farm (ignoring government payments) in the study area ($147,000, average for affected communities) are now included in the analysis for context.

*Comment 35:* One commenter stated that impacts to the Yaquina River unit were underestimated because there are on-going dredging and in-water construction projects in that area.

*Response:* The final economic analysis report considers dredging and in-water construction projects as potential threats to green sturgeon in the Yaquina River unit. However, the 404 permit data from the U.S. Army Corps of Engineers used to estimate the level of dredging and in-water construction activity taking place in the Yaquina River Unit do not indicate current projects in that area.

*Comment 36:* One commenter noted that the critical habitat designation could result in a significant, additional regulatory burden for the Port of Portland for in-water work activities (*e.g.,* dredging, wharf construction, and routine dock repairs).

*Response:* The economic analysis considers potential impacts to the Port's in-water work activities. The Port of Portland appears to fall within Unit 24b, the Lower Columbia River. For this unit, the final economic analysis report forecasts total annualized impacts of between $106,000 and $413,000 for dredging projects and $151,000 to $1,230,000 for in-water construction in this unit. A discussion of potentially affected commercial shipping resources is included in Section 4 of the final economic analysis report, and includes the Port of Portland.

*Comment 37:* Several commenters thought that the draft economic analysis failed to consider impacts to shoreline development. Specifically, the commenters argued that the proposed rule identified development and upland activities as economic activities that may adversely modify critical habitat and therefore may need to be altered. Therefore, the commenters believed that shoreline development should be addressed in the economic analysis.

*Response:* Typically the development issue of most concern is the potential for critical habitat to inhibit the development potential of affected land parcels, thereby constraining (or reducing) the land available for future development. In areas that are highly developed, or where developable land is scarce (for non-critical habitat related reasons), the reduction in available land due to critical habitat can impose significant economic impacts. However, the designation of critical habitat for the green sturgeon is not expected to result in these types of direct impacts on residential development for multiple reasons.

First, unlike terrestrial species, habitat for the green sturgeon is not itself part of the supply of developable land. For this reason, protection of the aquatic habitat need not take the form of supplanting development if the impacts of the development can be mitigated. Given the minimal consultation history for green sturgeon, a review of the information available for west coast

salmon and steelhead can provide further insight on this issue. For salmon and steelhead, NOAA fisheries personnel indicated that consultations regarding development projects are rare. Review of the salmon consultation history further supports this assessment, but more importantly, development consultations only addressed specific development activities with a Federal nexus, such as stormwater outfall structures (*i.e.,* consultations did not address the entire residential project, nor were any mitigation or land offsetting required). Based on this information, residential development for salmon and steelhead were not expected to have direct impact on the supply of land or housing for residential development. However, potential impacts on National Pollutant Discharge Elimination System (NPDES) permitted facilities were included.

Following this same approach, the final economic analysis report similarly does not anticipate any direct impacts to residential development in the form of reduced developable land. Rather, impacts to development activities are limited to the additional costs that would result from NPDES-related activities where a Federal nexus exists. The estimated number of NPDES-permitted facilities and the costs associated with these facilities as a result of the rulemaking are provided in Section 2.3 of the final economic analysis report. Potential threats from industrial or municipal runoff do not have a clear Federal connection; therefore, they are assumed to be dealt with primarily outside of the section 7 consultation realm.

*Comment 38:* Several commenters stated that the economic analysis did not consider impacts to specific projects involving dams and water diversions. One commenter stated that the draft economic analysis failed to discuss implications of the designation on the operations of the State Water Project and Central Valley Project. Another commenter inquired as to why specific discussion of Red Bluff Diversion Dam was not included in the draft economic analysis, and provided information on costs of constructing the Red Bluff Pumping Plant. In particular, the commenter noted that RBDD has undertaken a $165 million screened pumping plant as part of a Fish passage Improvement Project in the hope of minimizing impacts resulting from critical habitat designation. Another commenter provided information on potential costs of fish passage and dam removal at Daguerre Point Dam.

*Response:* Because of the large geographic area covered by proposed green sturgeon critical habitat and the large number of dams and water diversions located within the study area, Section 2.5 of the final economic analysis report broadly assumes that all dams do not currently have, but will require fish passage, and that all water diversions in affected watersheds do not currently have, but will require fish screens. For projects that already have fish passage facilities or fish screens, the analysis may overstate potential impacts. Because the analysis relies on average ranges of costs of these requirements, this approach may understate potential impacts for some individual projects. As a result, where public commenters provided specific cost estimates associated with potential fish passage issues in green sturgeon critical habitat areas, these have been incorporated into the final economic analysis report. Due to the regional importance the State Water Project and Central Valley Project, the final economic analysis report incorporates a more detailed discussion of these projects than was included in the draft economic analysis (*also see* response to Comment 24). Particularly relevant to the green sturgeon critical habitat area are the Red Bluff Diversion Dam and Daguerre Point Dam, which are now discussed in more detail.

*Comment 39:* One commenter stated that costs on the Upper and Lower Sacramento River units appear to be inordinately low. Specifically, the commenter noted that incremental impacts from possible special management measures and protections involving releases from dams or limiting diversions have potential to greatly magnify the economic impacts of the proposed rule and were not accurately captured in the economic analysis or proposed rule. The commenter also stated that agricultural operations are greatly affected by the operations of the Red Bluff Diversion Dam, which may not have been taken into account in the analysis.

*Response:* The amount of water within particular areas that may be diverted from activities such as irrigation, flood control, municipal water supply, and hydropower, for the purposes of green sturgeon is uncertain. As a result, a comprehensive prospective analysis of the impacts of potential water diversion from these activities would be highly speculative. In addition, the interrelated nature of dam and diversion projects, and hydrology, across river systems makes it impossible to attribute flow-related impacts from potential green sturgeon conservation measures to specific units. We acknowledge this limitation in the economic analysis. The final economic analysis, however, includes an expanded discussion of the potential impacts of changes in flow regimes on hydropower production and prices and water diversions on irrigation based on historical examples.

*Comment 40:* One commenter stated that the number of affected water diversions on the Upper Sacramento River may be underestimated because the designation may result in impacts to every single farm turnout in each of 17 water agencies.

*Response:* The final economic analysis report applies a watershed-based approach to determine the dams and water diversions potentially affected by this rule in riverine and estuarine areas. That is, all water diversions that fall within watersheds that contain proposed critical habitat for green sturgeon are assumed to require fish screens. The analysis does not expect that diversions outside of these watersheds will require fish screens on behalf of green sturgeon. In California, the final economic analysis report uses available GIS data from CalFish (A California Cooperative Anadromous Fish and Habitat Data Program; *http://www.calfish.org*) to estimate an aggregate number of potentially affected dams and water diversions by unit (*see* Exhibits 2–15 and 2–16). To the extent that the GIS data used does not reflect the locations of all water diversions, impacts could be understated for particular diversions.

*Comment 41:* One commenter noted that a recent ESA section 7 consultation for salmonids expanded pesticide buffer zones beyond the buffers used in the economic analysis. Specifically, the consultation widens the pesticide buffer to 1,000 feet for aerial applications and 500 feet for ground applications. The commenter noted that in the draft economic analysis, the buffer zone on which agricultural impacts were based was 300 feet for aerial application and 60 feet for ground application. The commenter stated that, consequently, the estimated impacts of green sturgeon critical habitat on agriculture were likely underestimated in the draft economic analysis. The commenter requested NMFS to clarify that no buffer is or will be required for green sturgeon regarding agricultural impacts, or alternatively, to revise the economic analysis consistent with the recent biological opinion.

*Response:* Section 2.4.3 of the final economic analysis report discusses the history of the Washington Toxics litigation (*Washington Toxics Coalition et al.* v. *EPA,* No. 04–35138), and the two recent consultations on salmon and

steelhead species with regard to specific pesticides and their use. Listed salmon and steelhead species are found in all units where agricultural pesticide application is a threat to green sturgeon habitat. There is evidence that triphenyltin, a common agricultural fungicide, has caused skeletal and/or morphological deformities in Chinese sturgeon (Hu *et al.* 2009). Also, laboratory studies conducted by researchers at UC Davis have shown that certain toxins cause deformities in white sturgeon and green sturgeon (Kruse and Scarnecchia 2002; Feist *et al.* 2005). At this time we do not have information on the effects of the use of agricultural chemicals on green sturgeon in the wild. However, given the similar responses of sturgeon (multiple species) to contaminants as compared to rainbow trout (representing salmonids), the application of buffer zones to protect salmonids from the application of pesticides and herbicides would be appropriate. Therefore, wherever and whenever protective buffer zones are applied for salmonid protection through the section 7 consultation process, green sturgeon would also benefit from the buffer zone guidelines.

The final economic analysis report assumes that the court-ordered injunction restricting pesticide use represents the dominant outcome of section 7 consultations for this activity, and that although the injunction is specifically for listed salmonid species, green sturgeon requirements could result in spray buffer increases of 20 percent, either through wider buffers or additional river segments requiring buffers.

The final economic analysis report also assumes that the agricultural net revenue generated by land within specified distances in critical habitat areas will be completely lost. That is, the analysis assumes that no changes in behavior are undertaken to mitigate the impact of pesticide restrictions. For example, this analysis assumes that no adjustments in cropping or pesticide practices are possible that would allow continued crop production without these pesticides. This assumption may lead to overestimated impacts of restricting pesticide use.

It should be noted that buffer distances have not yet been determined for many pesticides, and it may be that the salmon and steelhead injunction and subsequent consultation requirements will prove to be adequately protective of green sturgeon. As such, green sturgeon critical habitat would not be expected to add costs to those already expected to occur without the current rulemaking. Since the particular sensitivities of green sturgeon are not well understood, this analysis assumes that green sturgeon may require additional protections over and above those required for salmon species. To the extent that no additional requirements for green sturgeon are imposed over and above those put in place for salmonids, impacts of green sturgeon critical habitat could be overstated. To the extent that much wider buffers are identified than were included in the injunction, overall impacts to agriculture in green sturgeon critical habitat areas could be underestimated.

*Comment 42:* One commenter requested that the impacts to fisheries using other bottom tending gear be considered. The commenter stated that the economic analysis underestimated the economic impact of the proposed rule because it did not consider potential impacts on the shrimp fishery, gear types other than bottom trawl, or community level impacts.

*Response:* NMFS specifically identified the use of bottom trawl gear as a potential threat to green sturgeon and its habitat (*see* 73 FR 52093–52094), and other gears have not been identified as a threat. The best available information indicates that other bottom tending gear (*e.g.,* pot traps, long line) does not adversely affect benthic habitats, whereas the use of bottom trawl gear has a much more apparent effect on benthic habitats. Therefore, the economic analysis does not quantify economic impacts to fishing activities with other gear types. This analysis assumes that State-managed fisheries, such as the commercial crab fishery and pink shrimp fishery will not be affected by this rule. Information provided by the commenter, including the estimate that between two and 11 percent of shrimp tows may occur within the critical habitat area, have been included in the final economic analysis report.

*Comment 43:* One commenter noted that with regard to bottom trawl fishing impacts, the draft economic analysis could have produced more precise and geographically specific estimates for Washington Coast units. In particular, the commenter stated that catch attributed to Unit 37 should be attributed to Unit 36. Another commenter stated that the estimates of bottom trawl revenues seemed low for the area from Humboldt Bay to Cape Flattery, and provides alternative estimates based on log book data. In addition, the commenter noted that the broad scope of the economic analysis obscures the fact that impacts associated with critical habitat likely would fall disproportionately on particular vessels and coastal communities rather than evenly through a unit.

*Response:* The draft economic analysis used a series of assumptions to estimate the level of bottom trawl fishing effort occurring within proposed boundaries. The final economic analysis report revises this methodology, utilizing data provided by the Washington Department of Fish and Wildlife. As part of this effort, bottom trawl fishing estimates have been reallocated from Unit 37 to Unit 36, and landings data have been better tailored to appropriate units in California, Oregon and Washington. In addition, the economic analysis now discusses the potential for uneven distribution of green sturgeon impacts across fishing vessels and communities.

*Comment 44:* One comment provided additional information on the location of proposed tidal- and wave-energy projects. The comment specifically described five wave energy projects in Oregon waters.

*Response:* All of the projects described by the commenter are included in the final economic analysis report, as presented in Exhibit 3–3.

*Comment 45:* One commenter noted that the economic analysis failed to consider proposed wave and wind energy projects in Grays Harbor and other areas in Washington.

*Response:* The final economic analysis report does consider and project potential costs associated with wave and wind energy projects in the State of Washington. Specifically, Exhibit 3–3 of the final economic analysis report identifies one project (Grays Harbor Ocean Energy and Coastal Protection) in Grays Harbor and nine additional projects in Willapa Bay and Puget Sound.

*Comment 46:* One comment identified three LNG terminals approved or proposed in Oregon: the Jordan Cove LNG project (proposed) located in Coos Bay and the Bradford Landing LNG project (approved) and Oregon LNG project (proposed) located in the lower Columbia River estuary. The commenter stated that proposed dredging activities associated with these projects will impact green sturgeon feeding habitat. The commenter also noted other potential impacts associated with these projects from effects on water quality and quantity, an influx of invasive species, or entrainment of fish at water intake structures.

*Response:* The three LNG terminals identified by the commenter were already included and analyzed in the economic analysis for Coos Bay and the lower Columbia River estuary. The information regarding the potential

impacts of LNG projects on green sturgeon critical habitat are incorporated into this final rule and supporting documents.

*Comment 47:* According to one commenter, the draft economic analysis mischaracterized impacts to aquaculture operations in Willapa Bay and Grays Harbor. Specifically, the commenter noted that operations in these areas have not adopted the conservation measures outlined in the draft economic analysis, and that the adoption of these measures is economically infeasible. The commenter also noted that the draft economic analysis failed to consider the economic contribution of these operations to the regional economy.

*Response:* Section 4.2.4 of the final economic analysis report incorporates the comments provided, including a more detailed discussion of aquaculture practices in Washington and the economic significance of the aquaculture industry to Grays Harbor and Pacific counties. In addition, the final economic analysis report discusses the high level of uncertainty regarding potential conservation measures for aquaculture. The final economic analysis report now includes a discussion of the outcome of a recent consultation on aquaculture in Willapa Bay and Grays Harbor, which concluded that no reasonable and prudent measures were necessary for either salmonid or green sturgeon under the ESA. As such, it may be that no impacts to aquaculture are likely in these units related to green sturgeon critical habitat.

**ESA Section 4(b)(2) Analysis—Exclusion of Areas**

*Comment 48:* Several commenters requested an explanation of how the monetary thresholds used to determine the eligibility of an area for exclusion were derived.

*Response:* The economic impact level at which the economic benefits of exclusion outweigh the conservation benefits of designation is a matter of discretion. The ESA provides NMFS with the discretion to consider making exclusions if the benefits of exclusion outweigh the benefits of designation, unless exclusion will result in extinction of the species. The ESA gives NMFS broad discretion in what weight to give benefits. The benefits of exclusion (economic impacts) are estimated in monetary values, whereas the benefits of designation (conservation value of the areas) are expressed in qualitative conservation values. Because we could not directly compare the benefits of exclusion and benefits of designation, we applied a set of decision rules based on selected dollar thresholds representing the levels at which the potential economic impact associated with a specific area may outweigh the conservation benefits of designating that area. These thresholds varied depending on the conservation value of the area, where areas with a higher conservation value rating had a higher threshold dollar value. To determine these threshold values, we examined the range in economic impacts across all areas within a conservation value rating category, determined where the breakpoint occurred between relatively low economic impacts and relatively high economic impacts, and selected a value within the range of that breakpoint where the economic impacts may outweigh the conservation benefits for that area.

Our consideration of economic impacts under section 4(b)(2) of the ESA consisted of two parts. First, we applied the threshold dollar values to identify areas that may be eligible for exclusion based on economic impacts. We then presented the areas to the CHRT and asked the CHRT to further characterize the conservation benefit of designation for these areas by determining whether exclusion of the identified areas would significantly impede conservation of the Southern DPS. If the CHRT determined that exclusion of an area would significantly impede conservation of the Southern DPS, we used this information to analyze the conservation benefit of designation, leading to the final conservation value of the area being increased by one level.

*Comment 49:* One commenter stated that the economic thresholds established for the ESA section 4(b)(2) process only trigger consideration or eligibility of an area for potential exclusion. The commenter requested that an upper threshold be established above which the economic impact becomes disproportionate to the relative conservation benefit of designation and exclusion is definite. The commenter focused on the lower Feather River, stating that the economic costs are well above the $100,000 threshold.

*Response:* Section 4(b)(2) of the ESA requires that NMFS consider the economic impacts, impacts on national security, and other relevant impacts of designating any particular area as critical habitat. The ESA also provides NMFS with the discretion to exclude areas if the benefits of exclusion outweigh the benefits of designation, but does not require that exclusions be made. To weigh the economic benefits of exclusion against the benefits of designation, NMFS established monetary thresholds above which an area was potentially eligible for exclusion. These thresholds represent the level at which the economic impact may outweigh the relative conservation benefit of designation. NMFS did not define an upper threshold at which exclusion is required, however, because within a conservation value rating category there is variation, with some areas being of higher conservation value to the Southern DPS than others. In the case of the lower Feather River, the estimated economic impacts exceeded the dollar threshold value, signaling that the economic benefits of exclusion may outweigh the conservation benefits of exclusion for this area and that it may be eligible for exclusion. However, the CHRT determined that exclusion of the lower Feather River would significantly impede conservation of the Southern DPS, adding more weight to the conservation benefit of designation for this area, and leading to NMFS' determination that the economic benefits of exclusion do not outweigh the conservation benefits of designation. Thus, the lower Feather River was proposed for designation.

*Comment 50:* One commenter disagreed with the decision rule for areas with a High conservation value, that no economic impact could outweigh the benefit of designation for these specific areas (*i.e.,* specific areas with a High conservation value are not eligible for exclusion). The commenter stated that this decision rule is arbitrary and unreasonable.

*Response:* Section 4(b)(2) of the ESA provides NMFS the discretion to exclude any area from critical habitat if the benefits of exclusion (based on economic, national security, or other relevant impacts) outweigh the benefits of designation, unless exclusion of the area will result in extinction of the species. The ESA does not describe how this weighing process is to be conducted. Because data were not available to quantify or monetize the benefits of designation, we used the CHRT's conservation value ratings to represent the relative benefits of designation for each specific area. Areas with a High conservation value rating were identified by the CHRT as areas with a relatively high likelihood of promoting the conservation of the Southern DPS compared to the other areas. Based on the purposes of the ESA, which include providing a program for the conservation of threatened and endangered species, and the policy of Congress that all Federal agencies shall seek to conserve threatened and endangered species, NMFS exercised its broad discretion to designate all of the areas with a High conservation value.

This decision rule was also applied in the ESA 4(b)(2) analysis to support the 2005 critical habitat designations for listed West coast salmon and steelhead ESUs.

*Comment 51:* Two commenters requested the exclusion of Federal navigation channels and dredged material placement sites within Humboldt Bay, San Francisco Bay, Suisun Bay, San Pablo Bay, the Delta, and the Sacramento River and tributaries. The commenters asserted that the benefits of navigation traffic outweigh the conservation benefits of designation because these areas are dredged annually, are often deeper than green sturgeon depth preferences for all life stages, lack the PCEs, and make up a small proportion of the total area proposed for designation in estuaries and freshwater rivers.

*Response:* We appreciate the data provided by the commenter regarding dredging and disposal operations in the Central Valley, California, and in Humboldt Bay. We recognize that routine maintenance dredging and disposal operations are conducted to maintain the Federal navigation channels and that these activities have already altered the habitat within these channels and associated disposal sites. The CHRT considered the information provided, but determined that the areas requested for exclusion do contain PCEs that may require special management considerations or protection and provide valuable habitat for the Southern DPS. The Sacramento River supports all life stages and is the only confirmed spawning river for the Southern DPS. The Delta and the San Francisco, Suisun, and San Pablo bays support feeding, rearing, and migration by juvenile, subadult, and adult Southern DPS green sturgeon. Subadult and adult Southern DPS green sturgeon occupy Humboldt Bay for long periods of time, presumably for feeding during summer months. The best available data indicate that subadult and adult green sturgeon occur widely throughout these areas, based on detections of tagged green sturgeon through the estuaries and the Sacramento River. In addition, juvenile green sturgeon are believed to occur throughout the Delta and the San Francisco, Suisun, and San Pablo bays throughout all months of the year. The PCEs to support Southern DPS green sturgeon within these areas are affected by activities such as dredging and disposal (as described in the comments), dams and water diversions, in-water construction or alteration activities, and other activities as described in the final rule and supporting documents.

It is important to note that designation of critical habitat within these areas does not preclude dredging and disposal operations, but requires that Federal activities, or those requiring a Federal permit or funding and that may affect critical habitat, be evaluated under section 7 of the ESA to ensure that they do not destroy or adversely modify the habitat. The protective measures that may be required to address effects of dredging and disposal activities on critical habitat will depend on the specifics of the activity (*e.g.,* scale, location, time of year, *etc.*). NMFS will continue to work with the affected entities to determine the effects of the activities on critical habitat and to develop protective measures to address those effects.

*Comment 52:* One commenter stated that Central San Francisco Bay and Suisun Bay do not meet the definition of critical habitat because these specific areas are not essential for conservation of the Southern DPS and do not require special management considerations or protection. The commenter focused on sand mining activities, stating that sand mining operations result in localized, temporary disturbances that do not pose a serious threat to the PCEs and will not adversely affect migration and foraging. Also, the commenter stated that sand mining is heavily regulated and occurs in limited specific designated lease areas, only a portion of which is actually mined.

*Response:* The ESA defines critical habitat as specific areas within the geographical area occupied that contain physical or biological features essential to the conservation of the species and which may require special management considerations or protection. The CHRT considered the comments and verified that both Central San Francisco Bay and Suisun Bay meet the definition of critical habitat. Central San Francisco Bay and Suisun Bay were both rated as High conservation value areas that support feeding and migration for juvenile, subadult, and adult Southern DPS green sturgeon. Both areas contain at least one PCE that may require special management considerations or protection. We appreciate the information provided regarding the effects of sand mining on critical habitat and will consider such information in future consultations under section 7 of the ESA regarding sand mining operations. Final determinations will be made on a case-by-case basis during the section 7 consultation process. However, sand mining is only one of several activities identified that may affect the PCEs. Thus, even if sand mining does not adversely affect critical habitat, other activities occur within the areas that may affect the PCEs, including but not limited to: dredging and disposal of dredged material, in-water construction or alteration activities, and pollution. Finally, the fact that activities may already be regulated does not negate the need for special management considerations or protection. In determining whether a PCE may require special management considerations or protection, the CHRT focused on whether or not any activities may threaten the PCE.

*Comment 53:* One commenter requested the exclusion of nearshore regions where industrial activities occur within the San Francisco Bay, because these areas are not essential to the conservation of green sturgeon.

*Response:* The CHRT considered the comments but determined that the best available scientific data do not support the exclusion of these nearshore regions. San Francisco Bay supports feeding, rearing, and migration for juvenile, subadult, and adult Southern DPS green sturgeon. Green sturgeon occupy a diversity of depths throughout their different life stages, including shallow nearshore areas. Recent telemetry data and literature references indicate green sturgeon distribute widely throughout the bay and use extensive mudflats and sand flats for feeding. Based on the available data, it is reasonable to believe that green sturgeon use nearshore regions within San Francisco Bay. NMFS encourages research to better understand the use of these areas by different life stages of green sturgeon.

*Comment 54:* A commenter suggested that the Port of Stockton be excluded because it consists of deep water and developed shoreline and does not have the sediment quality that green sturgeon require.

*Response:* The CHRT considered this request to exclude the Port of Stockton from critical habitat, but ultimately decided that sufficient data to support exclusion are not available at this time. The best available data indicate that the Port of Stockton provides PCEs to support the rearing, feeding, and migration of juvenile, subadult, and adult Southern DPS green sturgeon. The PCEs may be affected by activities conducted within the area, but still continue to support the presence and use of this area by Southern DPS green sturgeon. Adult and subadult Southern DPS green sturgeon have been observed in the eastern Delta, including in the area adjacent to the Port of Stockton. Tagged green sturgeon have been detected at all three hydroacoustic monitors in the Deep Water Channel adjacent to the Port of Stockton.

Hydroacoustic monitors have not yet been installed in the Port of Stockton, however, and specific data on use of this area are lacking. In addition, juvenile green sturgeon rearing and feeding habitats are believed to occur throughout the Delta, but data are lacking on juvenile green sturgeon distribution in the Delta. At this time, the CHRT believes that juvenile green sturgeon are distributed widely throughout the Delta, and are, therefore, presumed to be in the Port of Stockton area. Studies focused on juvenile green sturgeon distribution in the Delta and San Francisco, San Pablo, and Suisun bays would help to address these data gaps and inform future revisions to the critical habitat designation.

*Comment 55:* One commenter requested that the area of the Sacramento River immediately upstream and downstream of RBDD be excluded from the critical habitat designation, because data for this area are not sufficient to support designation of critical habitat. The commenter was unclear whether RBDD is included as an existing structure as part of critical habitat or not. If it is, the commenter asserted that operation of the dam has no specific relationship to the numbers, range, or viability of green sturgeon. The commenter also stated that no analysis was done on the impacts that will result from restrictions on water diversions at RBDD.

*Response:* The CHRT identified the lower and upper Sacramento River, including the area immediately upstream and downstream of RBDD, as areas of High conservation value, recognizing that the areas support all life stages of Southern DPS green sturgeon and provide PCEs (including food resources, depth, migratory corridor, substrates, water quality, and water flow) to support migration, feeding, spawning, and rearing. The presence and operation of the RBDD has several effects on the Southern DPS. For example, the RBDD can hinder or block upstream and downstream migration when the gates are down, or cause injury or mortality if the gate opening is too small. In 2007, 10 green sturgeon were found injured and dead at or just downstream of RBDD, purportedly injured while trying to move under the gates. In addition, the RBDD may alter water quality and spawning habitats by altering the flow regime. Spawning by adult Southern DPS green sturgeon has been confirmed to occur both upstream and downstream of the RBDD, although conditions directly below the RBDD may not be favorable for spawning success due to high sedimentation levels (Poytress *et al.* 2009). Thus, the area immediately upstream and downstream of RBDD is of high conservation value to the Southern DPS and would benefit from protections under a critical habitat designation. The Sacramento River would be designated as critical habitat, but the RBDD itself would not be designated as critical habitat. The effects of operations at RBDD on critical habitat would be subject to consultation under section 7 of the ESA to address effects on critical habitat in the Sacramento River. As described in the response to comments 38 and 39, the potential impacts on RBDD are discussed in more detail in the final economic analysis report.

*Comment 56:* One commenter agreed with the CHRT that exclusion of the lower Feather River would significantly impede conservation of the Southern DPS, but two commenters disagreed and stated that the lower Feather River should be excluded from the designation because: (1) The estimated economic impacts substantially exceeded the $100,000 threshold for exclusion; (2) the area is not a confirmed spawning river and habitat improvements needed to make this area of High conservation value are not financially and logistically feasible; (3) designating the lower Feather River as a second spawning river for the Southern DPS is not warranted because the population is already protected from catastrophic risk by a naturally occurring second population in marine waters; and (4) the jeopardy provision under section 7 of the ESA provides adequate protection for the species. One commenter was unclear whether the biological analysis was based on current conditions or future conditions in the area. One commenter stated that there is little evidence to suggest green sturgeon occupy the lower Feather River above RKM 95, and another commenter stated that Fish Barrier Dam is the uppermost barrier, not Oroville Dam.

*Response:* The CHRT's evaluation of the lower Feather River was based on current conditions within the area as well as the potential future conditions if efforts to improve habitat conditions and passage are conducted. The best available data from surveys and anecdotal observations of green sturgeon indicate that green sturgeon consistently occupy and use the lower Feather River. Although spawning has not yet been confirmed, the CHRT believes the lower Feather River is the area most likely to serve as a second spawning river for the Southern DPS. The CHRT recognized that only part of the population returns to the Sacramento River to spawn each year, providing some protection should a catastrophic event occur. However, a second spawning river would provide not only additional protection from a catastrophic event but also additional spawning habitat should spawning habitats be inaccessible or subject to disturbance in the Sacramento River. Current and ongoing habitat monitoring and improvement activities are being conducted within the lower Feather River that may benefit the Southern DPS. NMFS encourages continued efforts to restore habitat and improve fish passage within the lower Feather River. The CHRT considered all of this information in making their determination that exclusion of this area would significantly impede conservation of the Southern DPS. This led NMFS to determine that, although the economic impacts for this area exceeded the $100,000 threshold, the economic benefit of exclusion did not outweigh the conservation benefit of designation. Thus, the lower Feather River was proposed for designation.

The CHRT considered the public comments received but, based on the information as described above, maintained its determination that exclusion of the Feather River would significantly impede conservation of the Southern DPS. NMFS also maintains its determination that the benefits of exclusion do not outweigh the benefits of designation for this area. However, the CHRT agreed that the upstream boundary for the lower Feather River should be changed from the Oroville Dam to the Fish Barrier Dam (RKM 109), because the Fish Barrier Dam represents the current upstream extent of green sturgeon passage. Green sturgeon have been observed at the Thermalito Outlet and in riffles between Thermalito Outlet and the Fish Barrier Dam (pers. comm. with Alicia Seesholtz, California Department of Water Resources (CDWR), March 10, 2009), confirming that green sturgeon do occur upstream of RKM 95, up to the Fish Barrier Dam (RKM 109). Thus, the specific area in the Lower Feather River was redefined as the area from the river mouth at the confluence with the Sacramento River, upstream to the Fish Barrier Dam.

*Comment 57:* Two commenters suggested that the lower Yuba River downstream of Daguerre Dam should not be designated as critical habitat, because data do not support that the lower Yuba River was historically a spawning river for green sturgeon as no green sturgeon juveniles, larvae, or eggs have been observed in the lower Yuba River to date and because adult and subadult green sturgeon occur infrequently in this area. The commenters cited numerous surveys that have been conducted since the

1970s with only one sighting of an adult green sturgeon in 2006. In addition, the commenters noted that flow regimes for green sturgeon may differ from those established under the Yuba Accord to protect salmonids and their habitat, which may result in conflicts in management and potentially high economic costs.

*Response:* We recognize that spawning has not been confirmed in the lower Yuba River downstream of Daguerre Dam and have revised the final rule accordingly. However, the CHRT determined that the lower Yuba River likely provides spawning habitat for Southern DPS green sturgeon. Although only one confirmed green sturgeon has been observed in the lower Yuba River, this does not indicate green sturgeon do not use the area more frequently. Surveys have been conducted in this area, but have not targeted green sturgeon. Observations of green sturgeon are difficult even during surveys targeting green sturgeon. For example, green sturgeon surveys in the lower Feather River conducted in 2000—2004 did not observe any green sturgeon, despite anecdotal observations of green sturgeon during the time surveys were conducted (CDWR 2005). More information is needed to determine the optimal flow regime for green sturgeon in the lower Yuba River and how this compares with flows established for salmonids. Consultation under section 7 of the ESA would take into account the needs of both the Southern DPS and the listed salmonid species.

*Comment 58:* Two commenters suggested that in the Columbia River, Grays Harbor, and Willapa Bay, critical habitat should be confined to certain portions of the estuaries because sturgeon are not evenly dispersed throughout these waters. The commenters requested that shellfish aquaculture areas be excluded from critical habitat, because green sturgeon do not use shellfish beds but instead occupy areas of high burrowing shrimp density outside of shellfish farming areas. In addition, the commenters asserted that carbaryl does not affect burrowing shrimp populations outside of treated areas and thus does not adversely affect green sturgeon prey resources. The commenters cited a recent study (Dumbauld *et al.* 2008) that suggests burrowing shrimp populations are abundant throughout the estuaries and are not likely to be a limiting factor for green sturgeon. The commenters also noted that carbaryl will be phased out by 2012 and replaced by more benign chemical, biological, or mechanical methods of eradication.

*Response:* The CHRT considered the comments but determined that the best available data do not support confining the critical habitat designation to certain portions of the lower Columbia River estuary, Grays Harbor, and Willapa Bay. Telemetry data show that tagged green sturgeon disperse widely throughout these estuaries, most likely for foraging. In addition, anecdotal accounts have noted observations of sturgeon in intertidal aquaculture beds in the past, likely when populations of sturgeon were more abundant in these estuaries, and have suggested that predation by sturgeon and other predators may help control burrowing shrimp populations in these beds (Dumbauld *et al.* 2008). Designation of critical habitat would require shellfish aquaculture activities that are funded, permitted, or carried out by Federal agencies to comply with section 7 of the ESA. During the consultation, factors such as the location and size of the project and the entity's initial evaluation of the effects of the project on critical habitat would be considered in determining whether the project adversely affects critical habitat. Information such as that provided by the commenters regarding the effects of carbaryl on green sturgeon prey resources would also be taken into account in the consultation.

*Comment 59:* One commenter suggested that the inner half of the Strait of Juan de Fuca and the area around the San Juan Islands should be excluded from the designation because these are areas of low use by green sturgeon.

*Response:* The CHRT considered the comment but determined that the best available scientific data support inclusion of the Strait of Juan de Fuca. Tagged Southern DPS green sturgeon are known to use the inner half of the Strait of Juan de Fuca, because they have been detected at receivers in the Strait of Juan de Fuca as well as in Puget Sound and Rosario Strait. The low numbers of detections may be due to relatively few tagged green sturgeon and relatively few receiver arrays located in the area. In addition, the receiver arrays were installed and operated to monitor other species and may not be programmed or positioned for optimal monitoring of green sturgeon.

*Comment 60:* One commenter stated that critical habitat should not be designated in coastal marine waters because there is insufficient data to show that bottom trawl fisheries affect green sturgeon migration or prey resources within coastal marine waters. The commenter noted that bottom trawling is not allowed in State waters off California and Washington and trawling off Oregon occurs deeper than 40 fm, leaving ample area for green sturgeon feeding and movement. The commenter suggested that coastal marine waters off southeast Alaska should be considered for designation because, although bottom trawling does not occur there, other bottom tending gear is used. The commenter stated that if critical habitat is to be designated in coastal marine waters, then other bottom tending gear should be considered and coastal marine waters off southeast Alaska should be designated.

*Response:* The CHRT considered all coastal marine waters within 110 m depth from the California-Mexico border to the Bering Sea, Alaska. The coastal marine areas off southeast Alaska were excluded based on economic impacts, not because bottom trawling fisheries do not occur in the area. Bottom trawling was only one of several activities identified that may affect the PCEs within the coastal marine areas. Other activities include hydrokinetic projects, disposal of dredged material, and pollution from activities such as commercial shipping. Thus, even if bottom trawl fisheries did not adversely affect the PCEs, there are other activities affecting the PCEs within the coastal marine areas. The CHRT focused on bottom trawl gear because bycatch of green sturgeon occurs in bottom trawl fisheries and this gear was identified by NMFS biologists as being the most likely to affect bottom habitat used by green sturgeon, compared with other bottom tending gear. However, all activities that may affect critical habitat would be subject to section 7 of the ESA even if not specifically mentioned in the final rule. Whether bottom trawl or other gear types adversely affect critical habitat would be determined through the ESA section 7 consultation process and would depend on factors such as the location, scale, and frequency of potential disturbances.

*Comment 61:* One commenter agreed that exclusion of Coos Bay from the designation would significantly impede conservation of the Southern DPS, whereas one commenter disagreed, stating that the inclusion of Coos Bay is not supported by the available data that indicate low numbers of green sturgeon and no evidence of use by Southern DPS fish.

*Response:* Coos Bay was identified as an area that may be eligible for exclusion based on economic impacts, but was proposed for designation and is included in this final designation based on a determination that exclusion of this area would significantly impede conservation of the Southern DPS and, therefore, the economic benefits of

exclusion do not outweigh the conservation benefits of designation. The CHRT considered the comments and maintained its determination that exclusion of Coos Bay would significantly impede conservation of the Southern DPS based on the best available information showing that Coos Bay is one of two large estuaries on the Oregon coast where relatively large numbers of green sturgeon are consistently observed (ODFW 2009a, b) and Southern DPS are confirmed to occur (Lindley and Moser, unpublished data, cited in the Memo to the Record from C. Grimes, October 23, 2006; pers. comm. with Dan Erickson, ODFW, September 3, 2008). In addition, there is uncertainty regarding the economic impact estimates for Coos Bay. As described in the ESA 4(b)(2) report, a large proportion of the estimated economic costs (ranging from $73,000 to $16 million) for Coos Bay was associated with impacts to a proposed LNG project in the bay. The high economic cost estimate of $16 million includes the estimated costs to re-site an LNG project due to this rule. The upper bound of the economic cost range is unlikely because: (1) It is highly uncertain whether the LNG project will be constructed; and (2) the high economic cost was associated with having to relocate the project, which is unlikely to occur. The low economic cost estimate of $73,000 was based on the assumption that additional measures would not be required for LNG projects for the protection of green sturgeon critical habitat, or that any required measures would result in minimal costs (*i.e.,* the economic impact for LNG projects is $0). We recognize, however, that an estimated economic impact of $0 for potential economic impacts to LNG projects is highly unlikely. Therefore, the actual economic impact on LNG projects is likely to be within this range (greater than $0, but much lower than $16 million), but we currently lack sufficient information to estimate this cost. Based on the information regarding the conservation value of Coos Bay to the Southern DPS and uncertainty regarding the estimated economic impacts, NMFS determined that the economic benefits of exclusion do not outweigh the conservation benefits of designation and Coos Bay is included in the final critical habitat designation.

*Comment 62:* One commenter requested an explanation for the exclusion of some waterways in the Sacramento-San Joaquin Delta, CA, from the proposed designation.

*Response:* The specific area designated as critical habitat in the Delta includes all tidally influenced areas up to the mean higher high water line within the legal boundaries of the Delta as defined in California Water Code Section 12220, except for two modifications. The CHRT defined the boundary between the Delta and Suisun Bay by a line extending from the mouth of Spoonbill Creek across the channel to the city of Pittsburg, CA, resulting in Chipps Island being fully contained within the Suisun Bay specific area. In addition, the following slough areas are excluded from the Delta specific area: Five Mile Slough, Seven Mile Slough, Snodgrass Slough (at Lambert Road), Tom Paine Slough, and Trapper Slough. These areas were identified and excluded by the CHRT as areas that all have manmade barriers isolating them from the rest of the Delta and where green sturgeon do not occur. Structures such as gated culverts, tidal gates, and siphons control the flow of water into the channels of these sloughs, which then primarily serve as ''reservoirs'' for irrigation water delivered to surrounding farm fields.

*Comment 63:* One commenter agreed with NMFS' proposal to exclude the waters off Alaska from the critical habitat designation, stating that Southern DPS green sturgeon rarely occur off the coast of southeast Alaska and that green sturgeon observed off Alaska most likely belong to the Northern DPS.

*Response:* There have been few observations of green sturgeon, particularly Southern DPS green sturgeon, in coastal marine waters off Alaska compared to coastal marine and estuarine waters in Washington, Oregon, and California. NMFS would like to clarify, however, that green sturgeon observed off Alaska could belong to either the Northern DPS or the Southern DPS. Since 1990, a total of 8 green sturgeon have been observed in the groundfish bottom trawl fishery conducted around the Aleutian Islands and in the Bering Sea (pers. comm. with Vanessa Tuttle, NMFS, November 20, 2006; pers. comm. with Jennifer Ferdinand, NMFS, November 24, 2006). Tissue samples were collected from 2 individuals captured in 2006, but genetic analyses to determine to which DPS the individuals belong were inconclusive (pers. comm. with Josh Israel, UC Davis). Two tagged Southern DPS green sturgeon were detected at the monitor in Graves Harbor, AK (currently the only monitor located on the Alaska coast; Lindley *et al.* 2008; pers. comm. with Steve Lindley, NMFS, September 12, 2007), showing that Southern DPS green sturgeon do migrate as far north as southeast Alaska. Given that there are no physical or environmental barriers present, it is possible that these fish migrate further north to the Aleutian Islands and the Bering Sea. Expansion of the monitoring array and collection of more tissue samples for genetic analyses are needed to better characterize the presence and distribution of Northern DPS and Southern DPS green sturgeon in coastal marine waters off Alaska.

**Impacts on National Security**

*Comment 64:* The Department of Defense (DOD) requested the exclusion of coastal marine waters in Oregon adjacent to the military training facility, Camp Rilea, due to national security concerns. The area requested for exclusion included an area from one-half mile north to one-half mile south of Camp Rilea to a distance of two miles offshore of Camp Rilea. This area encompasses the surface danger zone for weapons training ranges on Camp Rilea, but is not part of the Camp Rilea facility.

*Response:* We corresponded with representatives from Camp Rilea to discuss the activities occurring within the coastal marine waters adjacent to Camp Rilea and the potential impacts of the critical habitat designation on national security within this area. The activities identified to occur within this area included shooting range training exercises and amphibious landings. No in-water construction activities or activities affecting water quality were identified. The representatives for Camp Rilea agreed that the activities occurring within the area requested for exclusion would not likely affect critical habitat for the Southern DPS and that the critical habitat designation would not likely affect national security within the area. Thus, the benefits to national security of excluding this area were low. In addition, the area is located within a specific area with High conservation value that provides an important connectivity corridor for green sturgeon and is located just south of the lower Columbia River estuary, another specific area with High conservation value, and there are other Federal activities occurring in the area (*e.g.,* a submarine cable installation project) that may affect critical habitat. Thus, we determined that the benefits to national security of excluding this area did not outweigh the conservation benefits of designating the area. A more detailed analysis is provided in the final ESA section 4(b)(2) report (NMFS 2009c).

*Comment 65:* The DOD requested that the following areas off the coast of Washington be excluded from the critical habitat designation: (1) Strait of Juan de Fuca and Whidbey Island Naval Restricted Areas adjacent to the runways at the Naval Air Station (NAS)

Whidbey Island; (2) Strait of Juan de Fuca Naval Air-to-Surface Weapon Range Restricted Area; (3) Admiralty Inlet Naval Restricted Area; (4) Navy 3 Operating Area in the Strait of Juan de Fuca; (5) Navy 7/Admiralty Bay Naval Restricted Area 6701 in Puget Sound; and (6) the surf zone portion of the Quinault Underwater Tracking Range (QUTR) within the Pacific Northwest Operating Area.

*Response:* NMFS considered the DOD's request and the information provided by representatives from the Navy regarding the activities occurring within each of the areas requested for exclusion and the potential impacts on national security. NMFS determined that the benefits to national security of excluding the following areas outweigh the conservation benefits of designating the areas: Strait of Juan de Fuca and Whidbey Island Naval Restricted Area; Strait of Juan de Fuca Naval Air-to-Surface Weapon Range Restricted Area; Admiralty Inlet Naval Restricted Area; and Navy 3 Operating area (NMFS 2009c). We determined that the benefits of designation are low for these areas, because there are relatively few detections of green sturgeon in the area and the consultation history indicates that there are currently no other Federal activities occurring within these areas that may affect critical habitat. In addition, the size of the areas are small relative to the Strait of Juan de Fuca and the total critical habitat designation, and the Navy's presence provides some protection for green sturgeon habitat, either through regulatory control of public access or the nature of the Navy's activities that limit the kinds of other Federal activities that would occur in the areas. We also determined that the potential impacts on national security are low for these areas, because the Navy's current activities have a low likelihood of affecting critical habitat. However, we recognize that the range of activities that may be carried out in these areas are often critical to national security and that a critical habitat designation in these areas could delay or halt these activities in the future. Based on this information, we determined that the benefits of exclusion outweigh the benefits of designation and exclude the areas from the final designation. We note, however, that consultation under section 7 of the ESA would still be required to address activities that may cause jeopardy to or take of Southern DPS green sturgeon.

The Navy 7/Admiralty Bay Naval Restricted Area 6701 occurs in Puget Sound (an area that is excluded from the final critical habitat designation) and does not overlap with the specific area delineated in the Strait of Juan de Fuca (*see* ''Corrections from proposed rule''). Therefore, the Navy 7/Admiralty Bay Naval Restricted Area 6701 does not overlap with the critical habitat designation for the Southern DPS. In addition, at this time NMFS cannot determine whether the surf zone portion of the QUTR warrants exclusion from the critical habitat designation because the surf zone area has not yet been defined by the Navy. The surf zone portion of the QUTR is part of a proposed extension of the QUTR range that has not yet been finalized. The Navy informed NMFS that one of three alternative sites for the surf zone portion will be selected following completion of analyses under the National Environmental Policy Act (NEPA), estimated to be completed by the end of the year 2009. Until the area has been defined, NMFS cannot evaluate the impacts on national security and determine if those impacts outweigh the benefits of designating the area as critical habitat, because the location and size of the areas could change. Thus, the area will not be excluded from the critical habitat designation at this time. Once the location of the surf zone portion of the QUTR has been selected, the Navy may request that NMFS revise the critical habitat designation to exclude the area from critical habitat based on impacts on national security. A more detailed analysis for each of the areas requested for exclusion by the Navy is provided in the final ESA section 4(b)(2) report (NMFS 2009c).

*Comment 66:* The DOD commented that the area within the boundaries of the Mare Island US Army Reserve Center (USAR) near Vallejo, California, should not be eligible for consideration as critical habitat, because an integrated natural resources management plan (INRMP) is currently in place that provides the same, if not better, protection for listed species in waters adjacent to the Mare Island USAR Center. In addition, the DOD requested that the Mare Island USAR Center be excluded from designation based on impacts on national security.

*Response:* NMFS corresponded with representatives from the Mare Island USAR Center to discuss the INRMP and the potential impacts on national security. The Mare Island USAR Center is located in Mare Island Strait, where the Napa River flows into San Pablo Bay, California. The Mare Island USAR Center facilities include the waters between and around Piers 22 and 23, which overlap with the habitat areas considered for designation as critical habitat. NMFS' primary concerns were that: (1) The INRMP discusses the status and occurrence of green sturgeon in the area, but does not include protective measures specifically for green sturgeon; and (2) in-bay disposal of dredged material from dredging activities between and around the piers may affect proposed green sturgeon critical habitat.

Based on the information provided by the DOD, NMFS determined that the benefits to national security of excluding waters within the boundaries of the Mare Island USAR Center facility between and around Piers 22 and 23 outweigh the conservation benefit of designating the area (NMFS 2009c). One of the major national security concerns is that limitations on pier maintenance activities or on dredging activities between and around the piers could hinder the ability of vessels to move in and out of the piers for missions. Thus, the Mare Island USAR Center is excluded from the critical habitat designation for the Southern DPS. However, NMFS determined that the INRMP does not provide adequate protection for the threatened Southern DPS (*i.e.,* the INRMP does not provide a benefit to the species, as required by ESA section 4(a)(3)(B)(i)) and recommended revisions to the INRMP to adequately address the Southern DPS, including: (1) Providing updated data on tagged green sturgeon detections from monitors placed at Piers 22 and 23; and (2) providing conservation measures to address the effects of activities on green sturgeon. In addition, NMFS requests that, upon publication of this final rule, the INRMP be updated to incorporate information about the designation of critical habitat for the Southern DPS in waters adjacent to the Mare Island USAR Center in San Pablo Bay. Although the Mare Island USAR Center is excluded from the critical habitat designation, consultation under section 7 of the ESA would be required to address activities that may cause jeopardy to or take of Southern DPS green sturgeon, and to address activities that may affect designated critical habitat (for example, consultation would be required for the disposal of dredged material within designated critical habitat areas).

*Comment 67:* The DOD commented that the Military Ocean Terminal Concord (MOTCO) facility in Suisun Bay should not be eligible for consideration as critical habitat, because an existing INRMP for the facility already includes fishery measures that benefit green sturgeon. In addition, the DOD requested that the area be excluded from designation based on impacts on national security. The MOTCO operates within the property of the former Naval Weapons Station,

Detachment Concord, California, which was transferred from the U.S. Navy to the U.S. Army in fiscal year 2009. The U.S. Army is continuing operations at the MOTCO facilities in accordance with the INRMP prepared for the Naval Weapons Station Concord, as well as a Memorandum of Understanding (MOU) with the USFWS relating to the designation of a wetland preserve on the Naval Weapons Station Concord.

*Response:* NMFS corresponded with a representative from MOTCO to discuss the MOTCO facilities and the INRMP. Upon further review of the MOTCO facility maps and the information provided by the MOTCO representative, NMFS determined that the MOTCO facilities are adjacent to, but do not overlap with, the habitat areas considered for designation as critical habitat for the Southern DPS in Suisun Bay, California. The MOTCO representative agreed with the determination that there is no overlap between the MOTCO facilities and the areas considered for designation as critical habitat in Suisun Bay. Thus, the MOTCO facilities are not included in the critical habitat designation for Southern DPS green sturgeon. However, NMFS clarified that consultation under section 7 of the ESA would still be required to address jeopardy to or take of Southern DPS green sturgeon, or to address effects on designated critical habitat areas. NMFS also requested to be involved in reviewing the INRMP for the MOTCO facilities to ensure that green sturgeon are adequately addressed.

**Impacts on Indian Lands**

*Comment 68:* Several Tribes in Oregon and Washington requested the exclusion of Indian lands from the critical habitat designation. Some of the Tribes also requested the exclusion of the Tribes' usual and accustomed fishing areas due to concerns regarding the potential effects of the critical habitat designation on Tribal fisheries. The Tribes provided information regarding Tribal activities that may be affected by the critical habitat designation and maps showing the location of Indian lands and usual and accustomed fishing areas that may overlap with the areas considered for designation as critical habitat.

*Response:* NMFS corresponded with several Tribes in Washington and Oregon to discuss and better understand their concerns regarding the critical habitat designation. Based on the information received from the Tribes, NMFS determined that the areas of overlap between Indian lands and the areas considered for designation is small. In contrast, the benefits of excluding Indian lands from the designation are high and include: maintenance of NMFS' co-management and trust relationship with the Tribes and continued respect for Tribal sovereignty and self-governance, particularly with regard to the management of natural resources on Indian lands. Thus, NMFS determined that the benefits of exclusion outweigh the benefits of designation for Indian lands and that Indian lands are eligible for exclusion. This final rule excludes from the critical habitat designation Indian lands (as defined under the Secretarial Order titled ''American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act'') of the following Tribes: the Hoh, Jamestown S'Klallam, Lower Elwha, Makah, Quileute, Quinault, and Shoalwater Bay Tribes in Washington; the Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians and the Coquille Tribe in Oregon; and the Cachil DeHe Band of Wintun Indians of the Colusa Indian Community, Cher-Ae Heights Trinidad Rancheria, Wiyot Tribe, and Yurok Tribe in California. This exclusion applies only to current Indian lands and would not apply to additional Indian lands acquired by the Tribes in the future. The Tribes would need to request that NMFS revise the critical habitat designation for the Southern DPS to exclude any Indian lands acquired after the publication of this final rule. The final ESA section 4(b)(2) report (NMFS 2009c) documents NMFS' correspondence with the Tribes and NMFS' determination regarding the exclusion of Indian lands.

Three Tribes in Washington also requested the exclusion of usual and accustomed fishing areas from the critical habitat designation. The Tribes were primarily concerned with the potential impact of the critical habitat designation on Tribal fisheries in coastal estuaries and coastal marine waters. Based on the information provided by the Tribes, NMFS would expect the critical habitat designation to have minimal effects on Tribal fisheries. Tribal fisheries may cause take of Southern DPS green sturgeon and thus are more likely to be affected by take prohibitions as established in the proposed ESA 4(d) Rule for green sturgeon (74 FR 23822; May 21, 2009) than by the proposed critical habitat designation. In addition, usual and accustomed fishing areas are not necessarily coextensive with areas defined as ''Indian lands'' in various Federal policies, orders, and memoranda. Thus, we conclude that exclusion of usual and accustomed fishing areas outside those identified as Indian lands is not warranted. Tribal activities conducted outside of identified Indian lands and that have a Federal nexus (such as participation or funding by the Bureau of Indian Affairs), including those conducted within usual and accustomed fishing areas, would be subject to requirements under section 7 of the ESA to ensure no destruction or adverse modification of critical habitat.

**Unoccupied Areas**

*Comment 69:* Several commenters agreed with NMFS' decision not to designate unoccupied areas at this time, whereas two commenters disagreed with this decision. Several commenters urged NMFS not to designate critical habitat in unoccupied areas, stating that there is insufficient information to determine that any of the currently unoccupied areas identified are essential for conservation, catastrophic risk can be addressed by focusing on habitat improvements in currently occupied areas, and designation of unoccupied areas would result in high economic impacts. Commenters stated that the restoration of passage or habitat for green sturgeon in currently inaccessible or unsuitable habitats can be more appropriately addressed in the recovery planning process. Two commenters asserted that recovery would be impossible without establishing additional spawning populations for the Southern DPS with at least one inhabiting a separate basin from the Sacramento River. One commenter recommended that the removal or alteration of the Daguerre Dam on the Yuba River should be regarded as critical, to allow passage and access to potential spawning habitats in the Yuba River.

*Response:* Although the CHRT identified seven unoccupied areas that *may be essential* for conservation, they did not have data to support a determination that any of the unoccupied areas *are essential* for conservation of the Southern DPS. Of greatest importance was the lack of data on the historical use of these areas by green sturgeon. The CHRT did not have any evidence to confirm that green sturgeon historically occupied any of the seven unoccupied areas identified. In addition, green sturgeon do not appear to occupy the lower American River or the San Joaquin River presently, even though both systems are accessible to green sturgeon (*i.e.,* there is no physical barrier blocking upstream migration). The public comments did

not provide additional information on historical green sturgeon presence and use of these unoccupied areas. Thus, the CHRT maintained their determination that the unoccupied areas *may be essential* but that data are not available to determine that any of the unoccupied areas *are essential* for the conservation of the Southern DPS. The CHRT and NMFS recommend that future research be conducted to monitor these areas for green sturgeon presence and to better understand the current habitat conditions.

**National Environmental Policy Act of 1969 (NEPA)**

*Comment 70:* Two commenters stated that NMFS failed to comply with NEPA and that the absence of the NEPA review causes important impacts to remain unidentified, unrecognized, or ignored.

*Response:* We believe that in *Douglas County* v. *Babbitt,* 48 F. 3d 1495 (9th Cir. 1995), cert. denied, 116 S.Ct. 698 (1996), the Ninth Circuit Court of Appeals correctly interpreted the relationship between NEPA and the designation of critical habitat under the ESA. The Court rejected the suggestion that irreconcilable statutory conflict or duplicative statutory procedures are the only exceptions to application of NEPA to Federal actions. The Court held that the legislative history of the ESA demonstrated that Congress intended to displace NEPA procedures with carefully crafted procedures specific to the designation of critical habitat. Further, the Douglas County Court held that the critical habitat mandate of the ESA conflicts with NEPA in that, although the Secretary may exclude areas from critical habitat if such exclusion would be more beneficial than harmful, the Secretary has no discretion to exclude areas from designation if such exclusion would result in extinction. The Court noted that the ESA also conflicts with NEPA's demand for an impact analysis, in that the ESA dictates that the Secretary ''shall'' designate critical habitat for listed species based upon an evaluation of economic and other ''relevant'' impacts, which the Court interpreted as narrower than NEPA's directive. Finally, the Court, based upon a review of precedent from several circuits including the Fifth Circuit, held that an environmental impact statement is not required for actions that do not change the physical environment. The impacts of the critical habitat designation on activities occurring within the critical habitat areas were evaluated and considered in the economic analysis (Indecon 2009) and ESA section 4(b)(2) analysis (NMFS 2009c).

**Correction From Proposed Rule**

We made modifications to the boundaries for the Strait of Juan de Fuca to more accurately reflect the major basins associated with Puget Sound (Batelle Marine Sciences Laboratory *et al.* 2001). The boundary between the Strait of Juan de Fuca and Puget Sound should be defined by a line between Partridge Point on Whidbey Island and Point Wilson at Port Townsend. This final rule makes this correction in the regulatory text.

**Critical Habitat Identification and Designation**

Section 4(b)(2) of the ESA requires the designation of critical habitat for threatened and endangered species ''on the basis of the best scientific data available and after taking into consideration the economic impact, impact on national security, and any other relevant impact, of specifying any particular area as critical habitat.'' This section grants the Secretary [of Commerce] discretion to exclude any area from critical habitat if he determines ''the benefits of such exclusion outweigh the benefits of specifying such area as part of the critical habitat.'' The Secretary may not exclude an area if it ''will result in the extinction of the species.''

The ESA defines critical habitat under Section 3(5)(A) as:

> (i) [T]he specific areas within the geographical area occupied by the species, at the time it is listed * * *, on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and
>
> (ii) specific areas outside the geographical area occupied by the species at the time it is listed * * * upon a determination by the Secretary that such areas are essential for the conservation of the species.

The ESA defines conservation under section 3(3) to mean ''the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this Act are no longer necessary.''

Once critical habitat is designated, section 7 of the ESA requires Federal agencies to ensure they do not fund, authorize, or carry out any actions that will destroy or adversely modify that habitat. This requirement is in addition to the ESA section 7 requirement that Federal agencies ensure their actions do not jeopardize the continued existence of listed species.

In the following sections, we describe our methods for evaluating the areas considered for designation as critical habitat, our final determinations, and the final critical habitat designation. This description incorporates the changes described above in response to the public comments and peer reviewer comments.

**Methods and Criteria Used To Identify Critical Habitat**

In accordance with section 4(b)(2) of the ESA and our implementing regulations (50 CFR 424.12(a)), this rule is based on the best scientific information available concerning the Southern DPS' present and historical range, habitat, and biology, as well as threats to its habitat. In preparing this rule, we reviewed and summarized current information on the green sturgeon, including recent biological surveys and reports, peer-reviewed literature, NMFS status reviews for green sturgeon (Moyle *et al.* 1992; Adams *et al.* 2002; Biological Review Team (BRT) 2005), and the proposed and final listing rules for the green sturgeon (70 FR 17386, April 6, 2005; 71 FR 17757, April 7, 2006).

To assist with the evaluation of critical habitat, we convened the CHRT, comprised of nine Federal biologists from NMFS, the USFWS, and the U.S. Bureau of Reclamation (USBR) with experience in green sturgeon biology, consultations, and management, or experience in the critical habitat designation process. The CHRT used the best available scientific and commercial data and their best professional judgment to: (1) Verify the geographical area occupied by the Southern DPS at the time of listing; (2) identify the physical and biological features essential to the conservation of the species; (3) identify specific areas within the occupied area containing those essential physical and biological features; (4) verify whether the essential features within each specific area may need special management considerations or protection and identify activities that may affect these essential features; (5) evaluate the conservation value of each specific area; and (6) determine if any unoccupied areas are essential to the conservation of the Southern DPS. The CHRT's evaluation and conclusions are described in detail in the following sections, as well as in the final biological report (NMFS 2009a).

**Physical or Biological Features Essential for Conservation**

Joint NMFS–USFWS regulations, at 50 CFR 424.12(b), state that in

determining what areas are critical habitat, the agencies ''shall consider those physical and biological features that are essential to the conservation of a given species and that may require special management considerations or protection.'' Features to consider may include, but are not limited to: ''(1) Space for individual and population growth, and for normal behavior; (2) Food, water, air, light, minerals, or other nutritional or physiological requirements; (3) Cover or shelter; (4) Sites for breeding, reproduction, rearing of offspring, germination, or seed dispersal; and generally; (5) Habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species.'' The regulations also require the agencies to ''focus on the principal biological or physical constituent elements'' (hereafter referred to as ''Primary Constituent Elements'' or PCEs) within the specific areas considered for designation that are essential to conservation of the species, which ''may include, but are not limited to, the following: * * * spawning sites, feeding sites, seasonal wetland or dryland, water quality or quantity, * * * geological formation, vegetation type, tide, and specific soil types.''

The CHRT recognized that the different systems occupied by green sturgeon at specific stages of their life cycle serve distinct purposes and thus may contain different PCEs. Based on the best available scientific information, the CHRT identified PCEs for freshwater riverine systems, estuarine areas, and nearshore marine waters.

The specific PCEs essential for the conservation of the Southern DPS in freshwater riverine systems include:

(1) *Food resources.* Abundant prey items for larval, juvenile, subadult, and adult life stages. Although the CHRT lacked specific data on food resources for green sturgeon within freshwater riverine systems, juvenile green sturgeon most likely feed on fly larvae, amphipods, and bivalves, based on nutritional studies on the closely-related white sturgeon (Schreiber 1962; Radtke 1966; pers. comm. with Jeff Stuart, NMFS, January 14, 2008, and August 13, 2009). Food resources are important for juvenile foraging, growth, and development during their downstream migration to the Delta and bays. In addition, subadult and adult green sturgeon may forage during their downstream post-spawning migration, while holding within deep pools (Erickson *et al.* 2002), or on non-spawning migrations within freshwater rivers. Subadult and adult green sturgeon in freshwater rivers most likely feed on benthic prey species similar to those fed on in bays and estuaries, including shrimp, clams, and benthic fishes (Moyle *et al.* 1995; Erickson *et al.* 2002; Moser and Lindley 2007; Dumbauld *et al.* 2008).

(2) *Substrate type or size (i.e., structural features of substrates).* Substrates suitable for egg deposition and development (*e.g.,* bedrock sills and shelves, cobble and gravel, or hard clean sand, with interstices or irregular surfaces to ''collect'' eggs and provide protection from predators, and free of excessive silt and debris that could smother eggs during incubation), larval development (*e.g.,* substrates with interstices or voids providing refuge from predators and from high flow conditions), and subadults and adults (*e.g.,* substrates for holding and spawning). For example, spawning is believed to occur over substrates ranging from clean sand to bedrock (Emmett *et al.* 1991; Moyle *et al.* 1995), with preferences for gravel, cobble, and boulder (Poytress *et al.* 2009; pers. comm. with Dan Erickson, ODFW, September 3, 2008). Eggs likely adhere to substrates, or settle into crevices between substrates (Deng 2000; Van Eenennaam *et al.* 2001; Deng *et al.* 2002). Both embryos and larvae exhibited a strong affinity for benthic structure during laboratory studies (Van Eenennaam *et al.* 2001; Deng *et al.* 2002; Kynard *et al.* 2005), and may seek refuge within crevices, but use flat-surfaced substrates for foraging (Nguyen and Crocker 2007).

(3) *Water flow.* A flow regime (*i.e.,* the magnitude, frequency, duration, seasonality, and rate-of-change of fresh water discharge over time) necessary for normal behavior, growth, and survival of all life stages. Such a flow regime should include stable and sufficient water flow rates in spawning and rearing reaches to maintain water temperatures within the optimal range for egg, larval, and juvenile survival and development (11–19 °C) (Cech *et al.* 2000, cited in COSEWIC 2004; Mayfield and Cech 2004; Van Eenennaam *et al.* 2005; Allen *et al.* 2006). Sufficient flow is needed to reduce the incidence of fungal infestations of the eggs (Deng *et al.* 2002; Parsley *et al.* 2002). In addition, sufficient flow is needed to flush silt and debris from cobble, gravel, and other substrate surfaces to prevent crevices from being filled in (and potentially suffocating the eggs; Deng *et al.* 2002) and to maintain surfaces for feeding (Nguyen and Crocker 2007). Successful migration of adult green sturgeon to and from spawning grounds is also dependent on sufficient water flow. Spawning success is associated with water flow and water temperature. Spawning in the Sacramento River is believed to be triggered by increases in water flow to about 400 $m^3/s$ (average daily water flow during spawning months: 198–306 $m^3/s$) (Brown 2007). Post-spawning downstream migrations are triggered by increased flows, ranging from 174–417 $m^3/s$ in the late summer (Vogel 2005) and greater than 100 $m^3/s$ in the winter (Erickson *et al.* 2002; Benson *et al.* 2007; pers. comm. with Richard Corwin, USBR, June 5, 2008).

(4) *Water quality.* Water quality, including temperature, salinity, oxygen content, and other chemical characteristics, necessary for normal behavior, growth, and viability of all life stages. Suitable water temperatures would include: relatively stable water temperatures within spawning reaches (wide fluctuations could increase egg mortality or deformities in developing embryos); temperatures within 11–17 °C (optimal range = 14–16 °C) in spawning reaches for egg incubation (March–August) (Van Eenennaam *et al.* 2005); temperatures below 20 °C for larval development (Werner *et al.* 2007); and temperatures below 24 °C for juveniles (Mayfield and Cech 2004; Allen *et al.* 2006a). Suitable salinity levels range from fresh water (<3 parts per thousand (ppt)) for larvae and early juveniles (about 100 dph) to brackish water (10 ppt) for juveniles prior to their transition to salt water. Exposure to higher salinities may affect the temperature tolerances of juvenile green sturgeon (Sardella *et al.* 2008) and prolonged exposure to higher salinities may result in decreased growth and activity levels and even mortality (Allen and Cech 2007). Adequate levels of dissolved oxygen are needed to support oxygen consumption by fish in their early life stages (ranging from 61.78 to 76.06 mg $O_2$ $hr^{-1}$ $kg^{-1}$ for juveniles) (Allen and Cech 2007). Suitable water quality would also include water containing acceptably low levels of contaminants (*e.g.,* pesticides, polyaromatic hydrocarbons (PAHs), elevated levels of heavy metals) that may disrupt normal development of embryonic, larval, and juvenile stages of green sturgeon. Water with acceptably low levels of such contaminants would protect green sturgeon from adverse impacts on growth, reproductive development, and reproductive success (*e.g.,* reduced egg size and abnormal gonadal development) likely to result from exposure to contaminants (Fairey *et al.* 1997; Foster *et al.* 2001a; Foster *et al.* 2001b; Kruse and Scarnecchia 2002; Feist *et al.* 2005; Greenfield *et al.* 2005).

(5) *Migratory corridor.* A migratory pathway necessary for the safe and timely passage of Southern DPS fish within riverine habitats and between riverine and estuarine habitats (*e.g.,* an unobstructed river or dammed river that still allows for safe and timely passage). We define safe and timely passage to mean that human-induced impediments, either physical, chemical or biological, do not alter the migratory behavior of the fish such that its survival or the overall viability of the species is compromised (*e.g.,* an impediment that compromises the ability of fish to reach their spawning habitat in time to encounter con-specifics and reproduce). Unimpeded migratory corridors are necessary for adult green sturgeon to migrate to and from spawning habitats, and for larval and juvenile green sturgeon to migrate downstream from spawning/rearing habitats within freshwater rivers to rearing habitats within the estuaries.

(6) *Water depth.* Deep (≥5 m) holding pools for both upstream and downstream holding of adult or subadult fish, with adequate water quality and flow to maintain the physiological needs of the holding adult or subadult fish. Deep pools of ≥5 m depth with high associated turbulence and upwelling are critical for adult green sturgeon spawning and for summer holding within the Sacramento River (Poytress *et al.* 2009). Adult green sturgeon in the Klamath and Rogue rivers also occupy deep holding pools for extended periods of time, presumably for feeding, energy conservation, and/or refuge from high water temperatures (Erickson *et al.* 2002; Benson *et al.* 2007).

(7) *Sediment quality.* Sediment quality (*i.e.,* chemical characteristics) necessary for normal behavior, growth, and viability of all life stages. This includes sediments free of elevated levels of contaminants (*e.g.,* selenium, PAHs, and pesticides) that may adversely affect green sturgeon. Based on studies of white sturgeon, bioaccumulation of contaminants from feeding on benthic species may adversely affect the growth, reproductive development, and reproductive success of green sturgeon.

The specific PCEs essential for the conservation of the Southern DPS in estuarine areas include:

(1) *Food resources.* Abundant prey items within estuarine habitats and substrates for juvenile, subadult, and adult life stages. Prey species for juvenile, subadult, and adult green sturgeon within bays and estuaries primarily consist of benthic invertebrates and fishes, including crangonid shrimp, burrowing thalassinidean shrimp (particularly the burrowing ghost shrimp), amphipods, isopods, clams, annelid worms, crabs, sand lances, and anchovies. These prey species are critical for the rearing, foraging, growth, and development of juvenile, subadult, and adult green sturgeon within the bays and estuaries.

(2) *Water flow.* Within bays and estuaries adjacent to the Sacramento River (*i.e.,* the Sacramento-San Joaquin Delta and the Suisun, San Pablo, and San Francisco bays), sufficient flow into the bay and estuary to allow adults to successfully orient to the incoming flow and migrate upstream to spawning grounds. Sufficient flows are needed to attract adult green sturgeon to the Sacramento River to initiate the upstream spawning migration (Kohlhorst *et al.* 1991, cited in CDFG 2002; pers. comm. with Jeff Stuart, NMFS, February 24–25, 2008).

(3) *Water quality.* Water quality, including temperature, salinity, oxygen content, and other chemical characteristics, necessary for normal behavior, growth, and viability of all life stages. Suitable water temperatures for juvenile green sturgeon should be below 24 °C. At temperatures above 24 °C, juvenile green sturgeon exhibit decreased swimming performance (Mayfield and Cech 2004) and increased cellular stress (Allen *et al.* 2006). Suitable salinities range from brackish water (10 ppt) to salt water (33 ppt). Juveniles transitioning from brackish to salt water can tolerate prolonged exposure to salt water salinities, but may exhibit decreased growth and activity levels and a restricted temperature tolerance range (Allen and Cech 2007; Sardella *et al.* 2008), whereas subadults and adults tolerate a wide range of salinities (Kelly *et al.* 2007). Subadult and adult green sturgeon occupy a wide range of dissolved oxygen levels, but may need a minimum dissolved oxygen level of at least 6.54 mg $0_2$/l (Kelly *et al.* 2007; Moser and Lindley 2007). As described above, adequate levels of dissolved oxygen are also required to support oxygen consumption by juveniles (ranging from 61.78 to 76.06 mg $O_2$ $hr^{-1}$ $kg^{-1}$) (Allen and Cech 2007). Suitable water quality also includes water with acceptably low levels of contaminants (*e.g.,* pesticides, PAHs, elevated levels of heavy metals) that may disrupt the normal development of juvenile life stages, or the growth, survival, or reproduction of subadult or adult stages.

(4) *Migratory corridor.* A migratory pathway necessary for the safe and timely passage of Southern DPS fish within estuarine habitats and between estuarine and riverine or marine habitats. We define safe and timely passage to mean that human-induced impediments, either physical, chemical, or biological, do not alter the migratory behavior of the fish such that its survival or the overall viability of the species is compromised (*e.g.,* an impediment that compromises the ability of fish to reach thermal refugia by the time they enter a particular life stage). Within the bays and estuaries adjacent to the Sacramento River, unimpeded passage is needed for juvenile green sturgeon to migrate from the river to the bays and estuaries and eventually out into the ocean. Passage within the bays and the Delta is also critical for adults and subadults for feeding and summer holding, as well as to access the Sacramento River for their upstream spawning migrations and to make their outmigration back into the ocean. Within bays and estuaries outside of the Delta and the Suisun, San Pablo, and San Francisco bays, unimpeded passage is necessary for adult and subadult green sturgeon to access feeding areas, holding areas, and thermal refugia, and to ensure passage back out into the ocean.

(5) *Water depth.* A diversity of depths necessary for shelter, foraging, and migration of juvenile, subadult, and adult life stages. Subadult and adult green sturgeon occupy a diversity of depths within bays and estuaries for feeding and migration. Tagged adults and subadults within the San Francisco Bay estuary primarily occupied waters over shallow depths of less than 10 m, either swimming near the surface or foraging along the bottom (Kelly *et al.* 2007). In a study of juvenile green sturgeon in the Delta, relatively large numbers of juveniles were captured primarily in shallow waters from 1–3 meters deep, indicating juveniles may require even shallower depths for rearing and foraging (Radtke 1966). Thus, a diversity of depths is important to support different life stages and habitat uses for green sturgeon within estuarine areas.

(6) *Sediment quality.* Sediment quality (*i.e.,* chemical characteristics) necessary for normal behavior, growth, and viability of all life stages. This includes sediments free of elevated levels of contaminants (*e.g.,* selenium, PAHs, and pesticides) that can cause adverse effects on all life stages of green sturgeon (*see* description of ''Sediment quality'' for riverine habitats above).

The specific PCEs essential for the conservation of the Southern DPS in coastal marine areas include:

(1) *Migratory corridor.* A migratory pathway necessary for the safe and

timely passage of Southern DPS fish within marine and between estuarine and marine habitats. We define safe and timely passage to mean that human-induced impediments, either physical, chemical, or biological, do not alter the migratory behavior of the fish such that its survival or the overall viability of the species is compromised (*e.g.,* an impediment that compromises the ability of fish to reach abundant prey resources during the summer months in Washington and Oregon estuaries). Subadult and adult green sturgeon spend the majority of their lives in marine and estuarine waters outside of their natal rivers. Unimpeded passage within coastal marine waters is critical for subadult and adult Southern DPS green sturgeon to access oversummering habitats within coastal bays and estuaries and overwintering habitats within coastal waters between Vancouver Island, BC, and southeast Alaska (Lindley *et al.* 2008), as well as to return to its natal waters in the Sacramento River to spawn.

(2) *Water quality.* Coastal marine waters with adequate dissolved oxygen levels and acceptably low levels of contaminants (*e.g.,* pesticides, PAHs, heavy metals that may disrupt the normal behavior, growth, and viability of subadult and adult green sturgeon). Based on studies of tagged subadult and adult green sturgeon in the San Francisco Bay estuary, CA, and Willapa Bay, WA, subadults and adults may need a minimum dissolved oxygen level of at least 6.54 mg $O_2$/l (Kelly *et al.* 2007; Moser and Lindley 2007). As described above, exposure to and bioaccumulation of contaminants may adversely affect the growth, reproductive development, and reproductive success of subadult and adult green sturgeon. Thus, waters with acceptably low levels of such contaminants are required for the normal development of green sturgeon for optimal survival and spawning success.

(3) *Food resources.* Abundant prey items for subadults and adults, which may include benthic invertebrates and fish. Green sturgeon spend more than half their lives in coastal marine and estuarine waters, spending from 3–20 years at a time out at sea. Abundant food resources are important to support subadults and adults over long-distance migrations, and may be one of the factors attracting green sturgeon to habitats far to the north (off the coasts of Vancouver Island and Alaska) and to the south (Monterey Bay, CA, and off the coast of southern California) of their natal habitat. Although the CHRT lacked direct evidence, prey species likely include benthic invertebrates and fish similar to those fed upon by green sturgeon in bays and estuaries (*e.g.,* shrimp, clams, crabs, anchovies, sand lances).

**Geographical Area Occupied by the Species and Specific Areas Within the Geographical Area Occupied**

One of the first steps in the critical habitat designation process is to define the geographical area occupied by the species at the time of listing. The CHRT relied on data from tagging and tracking studies, genetic analyses, field observations, records of fisheries take and incidental take (*e.g.,* in water diversion activities), and opportunistic sightings to provide information on the current range and distribution of green sturgeon and of the Southern DPS. The range of green sturgeon extends from the Bering Sea, Alaska, to Ensenada, Mexico. Within this range, Southern DPS fish are confirmed to occur from Graves Harbor, Alaska, to Monterey Bay, California (Lindley *et al.* 2008; pers. comm. with Steve Lindley, NMFS, and Mary Moser, NMFS, February 24–25, 2008), based on telemetry data and genetic analyses. Green sturgeon have been observed northwest of Graves Harbor, AK, and south of Monterey Bay, CA, but have not been identified as belonging to either the Northern or Southern DPS. The CHRT concluded that there are no barriers or habitat conditions preventing Southern DPS fish detected in Monterey Bay, CA, or off Graves Harbor, AK, from moving further south or further north, and that the green sturgeon observed in these areas could belong to either the Northern DPS or the Southern DPS. Based on this reasoning, the geographical area occupied by the Southern DPS was defined as the entire range occupied by green sturgeon (*i.e.,* from the Bering Sea, AK, to Ensenada, Mexico), encompassing all areas where the presence of Southern DPS fish has been confirmed, as well as areas where the presence of Southern DPS fish is likely (based on the presence of confirmed Northern DPS fish or green sturgeon of unknown DPS).

Areas outside of the United States cannot be designated as critical habitat (50 CFR 424.12(h)). Thus, the occupied geographical area under consideration for this designation is limited to areas from the Bering Sea, AK, to the California/Mexico border, excluding Canadian waters. For freshwater rivers, the CHRT concluded that green sturgeon of each DPS are likely to occur throughout their natal river systems, but, within non-natal river systems, are likely to be limited to the estuaries and would not occur upstream of the head of the tide. For the purposes of our evaluation of critical habitat, we defined all green sturgeon observed upstream of the head of the tide in freshwater rivers south of the Eel River (*i.e.,* the Sacramento River and its tributaries) as belonging to the Southern DPS, and all green sturgeon observed upstream of the head of the tide in freshwater rivers north of and including the Eel River as belonging to the Northern DPS. Thus, for freshwater rivers north of and including the Eel River, the areas upstream of the head of the tide were not considered part of the geographical area occupied by the Southern DPS.

The CHRT then identified ''specific areas'' within the geographical area occupied. To be eligible for designation as critical habitat under the ESA, each specific area must contain at least one PCE that may require special management considerations or protection. For each specific occupied area, the CHRT noted whether the presence of Southern DPS green sturgeon is confirmed or likely (based on the presence of Northern DPS fish or green sturgeon of unknown DPS) and verified that each area contained one or more PCE(s) that may require special management considerations or protection. The following paragraphs provide a brief description of the presence and distribution of Southern DPS green sturgeon within each area and summarize the CHRT's methods for delineating the specific areas.

**Freshwater Rivers, Bypasses, and the Delta**

Green sturgeon occupy several freshwater river systems from the Sacramento River, CA, north to British Columbia, Canada (Moyle 2002). As described in the previous section, Southern DPS green sturgeon occur throughout their natal river systems (*i.e.,* the Sacramento River, lower Feather River, and lower Yuba River), but are believed to be restricted to the estuaries in non-natal river systems (*i.e.,* north of and including the Eel River). The CHRT defined the specific areas in the Sacramento, Feather, and Yuba rivers in California to include riverine habitat from the river mouth upstream to and including the furthest known site of historic and/or current sighting or capture of green sturgeon, as long as the site is still accessible. The specific areas were extended upstream to a geographically identifiable point. The riverine specific areas include areas that offer at least periodic passage of Southern DPS fish to upstream sites and include sufficient habitat necessary for each riverine life stage (*e.g.,* spawning,

egg incubation, larval rearing, juvenile feeding, passage throughout the river, and/or passage into and out of estuarine or marine habitat).

The CHRT delineated specific areas where Southern DPS green sturgeon occur, including: the Sacramento River, the Yolo and Sutter bypasses, the lower Feather River, and the lower Yuba River. The CHRT also delineated a specific area in the Sacramento-San Joaquin Delta. The mainstem Sacramento River is the only area where spawning by Southern DPS green sturgeon has been confirmed and where all life stages of the Southern DPS are supported. Beginning in March and through early summer, adult green sturgeon migrate as far upstream as the Keswick Dam (RKM 486) to spawn (Brown 2007; Heublein *et al.* 2008; Poytress *et al.* 2009). Spawning has been confirmed by the collection of larvae and juveniles at the RBDD and the Glenn-Colusa Irrigation District (GCID) (CDFG 2002; Brown 2007) and by the collection of green sturgeon eggs upstream and downstream of the RBDD (Brown 2007; Poytress *et al.* 2009). The Sacramento River provides important spawning, holding, and migratory habitat for adults and important rearing, feeding, and migratory habitat for larvae and juveniles. The Yolo and Sutter bypasses adjacent to the lower Sacramento River also serve as important migratory corridors for Southern DPS adults, subadults, and juveniles on their upstream or downstream migration and provide a high macroinvertebrate forage base that may support green sturgeon feeding. Southern DPS adults occupy the lower Feather River up to Fish Barrier Dam (RKM 109) and the lower Yuba River up to Daguerre Dam (RKM 19). Based on observations of Southern DPS adults occurring right up to the dams and of spawning behavior by adults on the Feather River, spawning may have occurred historically in the lower Feather River and, to a lesser extent, in the lower Yuba River. However, no green sturgeon eggs, larvae, or juveniles have ever been collected within these rivers. Further downstream, the Delta provides important rearing, feeding, and migratory habitat for juveniles, which occur throughout the Delta in all months of the year. Subadults and adults also occur throughout the Delta to feed, grow, and prepare for their outmigration to the ocean. The final biological report (NMFS 2009a) provides more detailed information on each specific area, including a description of the PCEs present, special management considerations or protection that may be needed, and the presence and distribution of Southern DPS green sturgeon. The final biological report is available upon request (*see* **ADDRESSES**), via our Web site at *http://swr.nmfs.noaa.gov,* or via the Federal eRulemaking Web site at *http://www.regulations.gov.* For additional discussion of the special management considerations or protection that may be needed for the PCEs, please *see* also the description of ''Special management considerations or protection'' below.

**Bays and Estuaries**

Southern DPS green sturgeon occupy coastal bays and estuaries from Monterey Bay, CA, to Puget Sound, WA. In the Central Valley, CA, juvenile, subadult, and adult life stages occur throughout the Suisun, San Pablo, and San Francisco bays. These bays support the rearing, feeding, and growth of juveniles prior to their first entry into marine waters. The bays also serve as important feeding, rearing, and migratory habitat for subadult and adult Southern DPS green sturgeon.

Outside of their natal system, subadult and adult Southern DPS fish occupy coastal bays and estuaries in California, Oregon, and Washington, including estuarine waters at the mouths of non-natal rivers. Subadult and adult Southern DPS green sturgeon have been confirmed to occupy the following coastal bays and estuaries: Monterey Bay and Humboldt Bay in California; Coos Bay, Winchester Bay, and Yaquina Bay in Oregon; the lower Columbia River estuary; and Willapa Bay, Grays Harbor, and Puget Sound in Washington (Chadwick 1959; Miller 1972; Lindley *et al.* 2008; Pinnix 2008; pers. comm. with Steve Lindley, NMFS, and Mary Moser, NMFS, February 24–25, 2008; pers. comm. with Dan Erickson, ODFW, September 3, 2008). The presence of Southern DPS green sturgeon is likely (based on limited records of confirmed Northern DPS fish or green sturgeon of unknown DPS), but not confirmed within the following coastal bays and estuaries: Elkhorn Slough, Tomales Bay, Noyo Harbor, Eel River estuary, and Klamath/Trinity River estuary in California; and the Rogue River estuary, Siuslaw River estuary, Alsea River estuary, Tillamook Bay, and Nehalem Bay in Oregon (Emmett *et al.* 1991; Moyle *et al.* 1992; Adams *et al.* 2002; Erickson *et al.* 2002; Yoklavich *et al.* 2002; Farr and Kern 2005; ODFW 2009a, b).

Subadult and adult green sturgeon are believed to occupy coastal bays and estuaries outside of their natal waters for feeding and optimization of growth (Moser and Lindley 2007; Lindley *et al.* 2008). Occupied coastal bays and estuaries north of San Francisco Bay, CA, contain oversummering habitats for subadults and adults, whereas coastal bays and estuaries south of San Francisco Bay, CA, are believed to contain overwintering habitats (Lindley *et al.* 2008). The largest concentrations of green sturgeon, including Southern DPS fish, occur within the lower Columbia River estuary, Willapa Bay, and Grays Harbor (Emmett *et al.* 1991; Adams *et al.* 2002; WDFW and ODFW 2002; Israel and May 2006; Moser and Lindley 2007; Lindley *et al.* 2008). Large numbers of green sturgeon also occur within Winchester Bay, Tillamook Bay, Coos Bay, Yaquina Bay, and Humboldt Bay (Moyle *et al.* 1992; Rien *et al.* 2000; Farr *et al.* 2001; Adams *et al.* 2002; Farr and Rien 2002, 2003; Farr and Kern 2004, 2005; Israel and May 2006; Lindley *et al.* 2008; Pinnix 2008; ODFW 2009a, b). Smaller numbers of green sturgeon occur in Tomales Bay in California (Moyle *et al.* 1992); the Siuslaw River estuary and Alsea River estuary in Oregon (ODFW 2009a, b); the lower Columbia River from RKM 74 to the Bonneville Dam (WDFW 2008); and Puget Sound in Washington (pers. comm. with Mary Moser, NMFS, March 11, 2008). Based on limited available data, green sturgeon presence is believed to be rare in Elkhorn Slough and Noyo Harbor in California (Emmett *et al.* 1991; Moyle *et al.* 1992; Yoklavich *et al.* 2002). Green sturgeon are present in the estuaries of the Eel River, Klamath/Trinity rivers, and Rogue River, but are believed to most likely belong to the Northern DPS. This is based on the fact that the Klamath/Trinity and Rogue rivers are spawning rivers for the Northern DPS and that the Northern DPS is defined to be inclusive of green sturgeon originating in coastal watersheds north of and including the Eel River. To date, no tagged Southern DPS subadults or adults have been detected in the estuaries of the three rivers, although Southern DPS fish have been observed in coastal marine waters just outside the mouth of the Klamath River (pers. comm. with Steve Lindley, NMFS, March 5, 2008).

The CHRT included all coastal bays and estuaries for which there was evidence to confirm the presence of green sturgeon, noting where there were confirmed Southern DPS fish, confirmed Northern DPS fish, or confirmed green sturgeon of unknown DPS. As stated in the previous section, based on our definitions for the Northern DPS and Southern DPS, any green sturgeon observed upstream of the head of the tide in freshwater rivers

north of and including the Eel River were assigned to the Northern DPS. Thus, areas upstream of the head of the tide on these rivers were not included as part of the occupied specific areas for the Southern DPS. Each specific area was defined to extend from the mouth of the bay or estuary upstream to the head of the tide. The boundary at the mouth of each bay or estuary was defined by the COLREGS demarcation line. COLREGS demarcation lines delineate ''those waters upon which mariners shall comply with the International Regulations for Preventing Collisions at Sea, 1972 (72 COLREGS) and those waters upon which mariners shall comply with the Inland Navigation Rules'' (33 CFR 80.01). Waters inside of the 72 COLREGS lines are Inland Rules waters and waters outside of the 72 COLREGS lines are COLREGS waters. The final biological report (NMFS 2009a) provides additional information for each specific area. For a copy of the report, *see* **ADDRESSES,** our Web site at *http://swr.nmfs.noaa.gov,* or the Federal eRulemaking Web site at *http://www.regulations.gov.* For additional discussion of the special management considerations or protection that may be needed for the PCEs, *see* the description of ''Special management considerations or protection'' below.

**Coastal Marine Waters**

Subadult and adult green sturgeon spend most of their lives in coastal marine and estuarine waters. The best available data indicate coastal marine waters are important for seasonal migrations from southern California to Alaska to reach distant foraging and aggregation areas. Green sturgeon occur primarily within the 110 m (60 fm) depth bathymetry (Erickson and Hightower 2007). Green sturgeon tagged in the Rogue River and tracked in marine waters typically occupied the water column at 40–70 m depth, but made rapid vertical ascents to or near the surface, for reasons yet unknown (Erickson and Hightower 2007). Green sturgeon use of waters shallower than 110 m (60 fm) depth was confirmed by coastal Oregon and Washington bottom-trawl fisheries records indicating that most reported locations of green sturgeon occurred inside of the 110 m depth contour from 1993–2000, despite the fact that most of the fishing effort occurred in water deeper than 110 m (Erickson and Hightower 2007).

Based on tagging studies of both Southern and Northern DPS fish, green sturgeon spend a large part of their time in coastal marine waters migrating between coastal bays and estuaries, including sustained long-distance migrations of up to 100 km per day (pers. comm. with Steve Lindley, NMFS, and Mary Moser, NMFS, cited in BRT 2005). These seasonal long-distance migrations are most likely driven by food resources. Some tagged individuals were observed swimming at slower speeds and spending several days within certain areas, suggesting that the individuals were feeding (pers. comm. with Steve Lindley, NMFS, and Mary Moser, NMFS, February 24–25, 2008).

Within the geographical area occupied (from the California/Mexico border to the Bering Sea, Alaska), the CHRT divided the coastal marine waters into 12 specific areas between those estuaries or bays that had been confirmed to be occupied by the Southern DPS. The presence of green sturgeon and Southern DPS fish within each area was based on data from tagging and tracking studies, records of fisheries captures, and NOAA Observer Program records. Tagged Southern DPS subadults and adults have been detected in coastal marine waters from Monterey Bay, CA, to Graves Harbor, AK, including the Strait of Juan de Fuca (Lindley *et al.* 2008). Green sturgeon bycatch data from NOAA's West Coast Groundfish Observer Program (WCGOP) support the telemetry results, showing green sturgeon occur from Monterey Bay, CA, to Cape Flattery, WA, with the greatest catch per unit effort in coastal waters from Monterey Bay to Humboldt Bay, CA (pers. comm. with Jon Cusick, NMFS, August 7, 2008). Because green sturgeon were only observed in the bottom trawl fishery, there were no data on green sturgeon bycatch off southeast Alaska, where bottom trawl fishing is prohibited. Green sturgeon have, however, been captured in bottom trawl fisheries along the coast off British Columbia. Although critical habitat cannot be designated within Canadian waters, it is important to note that several tagged Southern DPS green sturgeon have been detected off Brooks Peninsula on the northern tip of Vancouver Island, BC (Lindley *et al.* 2008). Patterns of telemetry data suggest that Southern DPS fish use oversummering grounds in coastal bays and estuaries along northern California, Oregon, and Washington and overwintering grounds off central California and between Vancouver Island, BC, and southeast Alaska (Lindley *et al.* 2008).

Based on the tagging data and the information described above regarding green sturgeon use of coastal bays and estuaries in California, Oregon, and Washington, the CHRT identified the coastal marine waters from Monterey Bay, CA, to Vancouver Island, BC, as the primary migratory/connectivity corridor for subadult and adult Southern DPS green sturgeon to migrate to and from oversummering habitats and overwintering habitats. Coastal marine waters off southeast Alaska were not considered part of the primary migratory/connectivity corridor for green sturgeon, but were recognized as an important area at the northern extent of the overwintering range, based on the detection of two tagged Southern DPS fish off Graves Harbor, AK, (pers. comm. with Steve Lindley, NMFS, September 12, 2007) and green sturgeon bycatch data along the northern coast of British Columbia (Lindley *et al.* 2008). For marine waters off northwest Alaska, data on green sturgeon occurrence include the capture of two green sturgeon of unknown DPS in bottom trawl groundfish fisheries off Kodiak Island, AK, and in the Bering Sea off Unimak Island, AK, in 2006 (pers. comm. with Duane Stevenson, NMFS, September 8, 2006). For the area south of Monterey Bay, a few green sturgeon of unknown DPS have been captured off Huntington Beach and Newport (Roedel 1941), Point Vicente (Norris 1957), Santa Barbara, and San Pedro (pers. comm. with Rand Rasmussen, NMFS, July 18, 2006). More detailed information on the specific areas within coastal marine waters can be found in the final biological report (NMFS 2009a), available at our Web site at *http://swr.nmfs.noaa.gov,* at the Federal eRulemaking Web site at *http://www.regulations.gov,* or upon request (*see* **ADDRESSES**). For additional discussion of the special management considerations or protection that may be needed for the PCEs, please *see* the description of ''Special management considerations or protection'' below.

**Special Management Considerations or Protection**

Joint NMFS and USFWS regulations at 50 CFR 424.02(j) define ''special management considerations or protection'' to mean ''any methods or procedures useful in protecting physical and biological features of the environment for the conservation of listed species.'' Based on discussions with the CHRT and consideration of the draft economic report, a number of activities were identified that may threaten the PCEs such that special management considerations or protection may be required. Major categories of habitat-related activities include: (1) Dams; (2) water diversions; (3) dredging and disposal of dredged material; (4) in-water construction or alterations, including channel

modifications/diking, sand and gravel mining, gravel augmentation, road building and maintenance, forestry, grazing, agriculture, urbanization, and other activities; (5) NPDES permit activities and activities generating non-point source pollution; (6) power plants; (7) commercial shipping; (8) aquaculture; (9) desalination plants; (10) proposed alternative energy projects; (11) liquefied natural gas (LNG) projects; (12) bottom trawling; and (13) habitat restoration. These activities may have an effect on one or more PCE(s) via their alteration of one or more of the following: stream hydrology, water level and flow, water temperature, dissolved oxygen, erosion and sediment input/transport, physical habitat structure, vegetation, soils, nutrients and chemicals, fish passage, and stream/estuarine/marine benthic biota and prey resources. The CHRT identified the activities occurring within each specific area that may necessitate special management considerations or protection for the PCEs and these are described briefly in the following paragraphs. These activities are documented more fully in the final biological report and final economic analysis report.

Table 1 lists the specific areas and the river miles or area (square miles) covered, the PCEs present, and the activities that may affect the PCEs for each specific area and necessitate the need for special management considerations or protection. Several activities may affect the PCEs within the freshwater rivers, bypasses, and the Sacramento-San Joaquin Delta (the Delta). Within the rivers, dams and diversions pose threats to habitat features essential for the Southern DPS by obstructing migration, altering water flows and temperature, and modifying substrate composition within the rivers. Pollution from agricultural runoff and water returns, as well as from other point and non-point sources, adversely affects water quality within the rivers, bypasses and the Delta. Water management practices in the bypasses may pose a threat to Southern DPS fish residing within or migrating through the bypasses. For example, low water levels may obstruct passage through the bypasses, resulting in stranded fish. Within the Delta, activities such as dredging, pile driving, water diversion, and the discharge of pollutants from point and non-point sources can adversely affect water quality and prey resources, as well as alter the composition and distribution of bottom substrates within the Delta.

Several activities were also identified that may threaten the PCEs in coastal bays and estuaries and may necessitate the need for special management considerations or protection (Table 1). The application of pesticides may adversely affect prey resources and water quality within the bays and estuaries. For example, in Willapa Bay and Grays Harbor, the use of carbaryl in association with aquaculture operations reduces the abundance and availability of burrowing ghost shrimp, an important prey species for green sturgeon (Moser and Lindley 2007; Dumbauld *et al.* 2008). In the San Francisco, San Pablo, and Suisun bays, several pesticides have been detected at levels exceeding national benchmarks for the protection of aquatic life (Domagalski *et al.* 2000). These pesticides pose a water quality issue and may affect the abundance and health of prey items as well as the growth and reproductive health of Southern DPS green sturgeon through bioaccumulation. Other activities of concern include those that may disturb bottom substrates, adversely affect prey resources, or degrade water quality through re-suspension of contaminated sediments.

Several activities were identified that may affect the PCEs within coastal marine areas such that the PCEs would require special management consideration or protection (Table 1). The fact that green sturgeon were only captured in the bottom trawl fishery (pers. comm. with Jon Cusick, NMFS, August 7, 2008) provides evidence that green sturgeon are associated with the benthos and thus exposed to activities that disturb the bottom. Of particular concern are activities that affect prey resources. Prey resources likely include species similar to those fed on by green sturgeon in bays and estuaries (*e.g.,* burrowing ghost shrimp, mud shrimp, crangonid shrimp, amphipods, isopods, Dungeness crab), and can be affected by: commercial shipping and activities generating point source pollution (subject to NPDES requirements) and non-point source pollution that can discharge contaminants and result in bioaccumulation of contaminants in green sturgeon; disposal of dredged materials that can bury prey resources; and bottom trawl fisheries that can disturb the bottom (but may result in beneficial or adverse effects on prey resources for green sturgeon). In addition, petroleum spills from commercial shipping activities and proposed alternative energy hydrokinetic projects may affect water quality or hinder the migration of green sturgeon along the coast and may necessitate special management of the PCEs.

TABLE 1—SUMMARY OF OCCUPIED SPECIFIC AREAS WITHIN FRESHWATER RIVERS, THE BYPASSES, THE SACRAMENTO-SAN JOAQUIN DELTA, COASTAL BAYS AND ESTUARIES, AND COASTAL MARINE AREAS (WITHIN 60 FM DEPTH)

[The river kilometers or surface area covered, the PCEs present, and activities that may affect the PCEs and necessitate the need for special management considerations or protection within each area are listed. PCEs: Wd = depth, Fd = food, Fl = water flow, P = passage, S = substrates, Sq = sediment quality, Wq = water quality. Activities: AG = agriculture, AQ = aquaculture, BOT = bottom trawl fishing, CON = in-water construction or alterations, DAM = dams, DESAL = desalination plants, DIV = water diversions, DR = dredging and deposition of dredged material, EP = alternative energy hydrokinetic projects, LNG = LNG projects, POLL = point and non-point source pollution, PP = power plants, REST = restoration, SHIP = commercial shipping]

| Specific area | River km | PCEs present | Activities |
|---|---|---|---|
| **Freshwater Rivers** | | | |
| Upper Sacramento River, CA | 95 | Wd, Fd, Fl, P, S, Sq, Wq | CON, DAM, DIV, POLL, REST |
| Lower Sacramento River, CA | 294 | Wd, Fd, Fl, P, S, Sq, Wq | AG, CON, DAM, DIV, DR, POLL, REST |
| Lower Feather River, CA | 109 | Wd, Fl, P, Wq | AG, CON, DAM, DIV, POLL, REST |
| Lower Yuba River, CA | 18 | Wd, Fl, P, Wq | AG, CON, DAM, DIV, POLL, REST |
| Sacramento-San Joaquin Delta, CA | 784 | Wd, Fd, Fl, P, S, Sq, Wq | CON, DAM, DIV, DR, POLL, PP, REST, SHIP |

TABLE 1—SUMMARY OF OCCUPIED SPECIFIC AREAS WITHIN FRESHWATER RIVERS, THE BYPASSES, THE SACRAMENTO-SAN JOAQUIN DELTA, COASTAL BAYS AND ESTUARIES, AND COASTAL MARINE AREAS (WITHIN 60 FM DEPTH)—(Continued)

[The river kilometers or surface area covered, the PCEs present, and activities that may affect the PCEs and necessitate the need for special management considerations or protection within each area are listed. PCEs: Wd = depth, Fd = food, Fl = water flow, P = passage, S = substrates, Sq = sediment quality, Wq = water quality. Activities: AG = agriculture, AQ = aquaculture, BOT = bottom trawl fishing, CON = in-water construction or alterations, DAM = dams, DESAL = desalination plants, DIV = water diversions, DR = dredging and deposition of dredged material, EP = alternative energy hydrokinetic projects, LNG = LNG projects, POLL = point and non-point source pollution, PP = power plants, REST = restoration, SHIP = commercial shipping]

| Specific area | Area (sq km) | PCEs present | Activities |
|---|---|---|---|
| **Bypasses and the Delta** | | | |
| Yolo Bypass, CA | 289 | Fd, P, Sq, Wq | AG, DAM, DIV, POLL, REST |
| Sutter Bypass, CA | 61 | Fd, P, Sq, Wq | AG, CON, DAM, DIV, POLL, REST |
| **Coastal Bays and Estuaries** | | | |
| Elkhorn Slough, CA | 3 | Fd, Sq, P, Wq | CON, DR, POLL, PP |
| Suisun Bay, CA | 131 | Wd, Fd, Fl, P, Sq, Wq | CON, DR, POLL, PP, REST, SHIP |
| San Pablo Bay, CA | 329 | Wd, Fd, P, Sq, Wq | CON, DR, POLL, PP, REST, SHIP |
| San Francisco Bay, CA | 700 | Wd, Fd, P, Sq, Wq | CON, DR, EP, POLL, PP, REST, SHIP |
| Tomales Bay, CA | 30 | Fd, P, Sq, Wq | AG, AQ, CON, DIV, POLL, REST |
| Noyo Harbor, CA | 0.1 | Fd, P, Sq, Wq | CON, DR, POLL |
| Eel R. estuary, CA | 22 | Fd, P, Sq, Wq | CON, POLL |
| Humboldt Bay, CA | 68 | Fd, P, Sq, Wq | AG, AQ, CON, DR, POLL, SHIP |
| Klamath/Trinity R. estuary, CA | 6 | Fd, P, Sq, Wq | CON, POLL |
| Rogue R. estuary, OR | 1 | Fd, P, Sq, Wq | CON, POLL |
| Coos Bay, OR | 48 | Fd, P, Sq, Wq | CON, DR, LNG, POLL, SHIP |
| Winchester Bay, OR | 22 | Fd, P, Sq, Wq | CON, POLL |
| Siuslaw R. estuary, OR | 1 | Fd, P, Sq, Wq | CON, POLL |
| Alsea R. estuary, OR | 2 | Fd, P, Sq, Wq | CON, DIV, POLL |
| Yaquina Bay, OR | 12 | Fd, P, Sq, Wq | CON, DR, POLL |
| Tillamook Bay, OR | 37 | Fd, P, Sq, Wq | CON, DR, POLL |
| Nehalem Bay, OR | 8 | Fd, P, Sq, Wq | CON, DR, POLL |
| Lower Columbia river estuary (RKM 0 to 74). | 414 | Fd, P, Sq, Wq | CON, DAM, DR, LNG, POLL, SHIP |
| Lower Columbia River (RKM 74 to Bonneville Dam). | 207 | Fd, P, Sq, Wq | CON, DAM, DR, POLL, SHIP |
| Willapa Bay, WA | 347 | Fd, P, Sq, Wq | AQ, CON, DR, EP, POLL |
| Grays Harbor, WA | 245 | Fd, P, Sq, Wq | AQ, CON, DR, POLL, SHIP |
| Puget Sound, WA | 2,636 | Fd, P, Sq, Wq | AQ, CON, DR, EP, POLL, SHIP |
| **Coastal Marine Waters Within 60 fm Depth** | | | |
| CA/Mexico border to Monterey Bay, CA | 6,534 | Fd, P, Wq | AQ, BOT, CON, DESAL, DR, EP, LNG, POLL, PP |
| Monterey Bay, CA, to San Francisco Bay, CA. | 3,868 | Fd, P, Wq | BOT, CON, DESAL, DR, EP, LNG, POLL, PP |
| San Francisco Bay, CA, to Humboldt Bay, CA. | 5,385 | Fd, P, Wq | BOT, DR, EP, LNG, POLL, PP |
| Humboldt Bay, CA, to Coos Bay, OR | 4,865 | Fd, P, Wq | BOT, DR, EP, LNG, POLL, PP |
| Coos Bay, OR, to Winchester Bay, OR | 463 | Fd, P, Wq | BOT, DR, EP, LNG |
| Winchester Bay, OR, to Columbia R. estuary. | 6,789 | Fd, P, Wq | BOT, DR, EP, LNG, POLL |
| Columbia R. estuary to Willapa Bay, WA | 1,167 | Fd, P, Wq | BOT, DR, EP, LNG |
| Willapa Bay, WA, to Grays Harbor, WA | 1,087 | Fd, P, Wq | BOT, DR, EP, LNG |
| Grays Harbor, WA, to WA/Canada border | 4,924 | Fd, P, Wq | BOT, DR, EP, LNG, POLL |
| Strait of Juan de Fuca, WA | 1,352 | Fd, P, Wq | BOT, DR, EP, LNG, POLL |
| Canada/AK border to Yakutat Bay, AK | 53,577 | Fd, P, Wq | DR, EP, LNG, POLL, SHIP |
| Coastal Alaskan waters northwest of Yakutat Bay, AK, including the Bering Sea to the Bering Strait. | 974,505 | Fd, P, Wq | BOT, DR, EP, LNG, POLL, SHIP |

**Unoccupied Areas**

Section 3(5)(A)(ii) of the ESA authorizes the designation of ''specific areas outside the geographical area occupied at the time [the species] is listed'' if these areas are essential for the conservation of the species. Regulations at 50 CFR 424.12(e) emphasize that the agency ''shall designate as critical habitat areas outside the geographical area presently occupied by a species only when a designation limited to its present range would be inadequate to ensure the conservation of the species.'' The CHRT considered that a critical habitat designation limited to presently occupied areas may not be sufficient for conservation, because such a designation would not address one of the major threats to the population identified by the Status Review Team—

the concentration of spawning into one spawning river (*i.e.,* the Sacramento River), and, as a consequence, the risk of extirpation due to a catastrophic event.

In the proposed rule, we described seven unoccupied areas identified by the CHRT in the Central Valley, California that may provide additional spawning habitat for the Southern DPS of green sturgeon. These seven areas include areas behind dams that are currently inaccessible to green sturgeon and areas below dams that are not currently occupied by green sturgeon. The areas include: (1) Reaches upstream of Oroville Dam on the Feather River; (2) reaches upstream of Daguerre Dam on the Yuba River; (3) areas on the Pit River upstream of Keswick and Shasta dams; (4) areas on the McCloud River upstream of Keswick and Shasta dams; (5) areas on the upper Sacramento River upstream of Keswick and Shasta dams; (6) reaches on the American River; and (7) reaches on the San Joaquin River. We did not propose to designate any of these unoccupied areas, however, because we lacked sufficient data to determine whether any of these areas actually are essential for conservation of the Southern DPS. Instead, we solicited additional information from the public to inform the CHRT's evaluation of these areas, particularly regarding: (1) The historical use of the currently unoccupied areas by green sturgeon; and (2) the likelihood that habitat conditions within these unoccupied areas will be restored to levels that would support green sturgeon presence and spawning (*e.g.,* restoration of fish passage and sufficient water flows and water temperatures).

As described above in the Responses to Comments section, several comments were received supporting or opposing the designation of unoccupied areas, but no substantive information was provided to support designation of these areas. The CHRT maintained its determination that these seven unoccupied areas *may be essential,* but there is insufficient data at this time to determine whether any of these areas actually *are essential* to the conservation of the Southern DPS. This final rule does not designate any unoccupied areas as critical habitat for the Southern DPS. NMFS encourages additional study of green sturgeon use of these areas and actions that would protect, conserve, and/or enhance habitat conditions for the Southern DPS (*e.g.,* habitat restoration, removal of dams, and establishment of fish passage) within these areas. Additional information would inform our consideration of these areas for future revisions to the critical habitat designation as well as future recovery planning for the Southern DPS.

**Military Lands**

Under the Sikes Act of 1997 (Sikes Act) (16 U.S.C. 670a), ''each military installation that includes land and water suitable for the conservation and management of natural resources'' is required to develop and implement an integrated natural resources management plan (INRMP). An INRMP integrates implementation of the military mission of the installation with stewardship of the natural resources found there. Each INRMP includes: An assessment of the ecological needs on the military installation, including the need to provide for the conservation of listed species; a statement of goals and priorities; a detailed description of management actions to be implemented to provide for these ecological needs; and a monitoring and adaptive management plan. Each INRMP must, to the extent appropriate and applicable, provide for fish and wildlife management, fish and wildlife habitat enhancement or modification, wetland protection, enhancement, and restoration where necessary to support fish and wildlife and enforcement of applicable natural resource laws.

The ESA was amended by the National Defense Authorization Act for Fiscal Year 2004 (Pub. L. 108–136) to address the designation of military lands as critical habitat. ESA section 4(a)(3)(B)(i) states: ''The Secretary shall not designate as critical habitat any lands or other geographical areas owned or controlled by the Department of Defense, or designated for its use, that are subject to an integrated natural resources management plan prepared under section 101 of the Sikes Act (16 U.S.C. 670a), if the Secretary determines in writing that such plan provides a benefit to the species for which critical habitat is proposed for designation.''

During the development of the proposed rule, we contacted the DOD and requested information on all INRMPs for DOD facilities that overlap with the specific areas considered for designation as critical habitat and that might provide benefits to green sturgeon. The INRMPs for one facility in California (Camp San Luis Obispo) and for nine facilities in Puget Sound, WA, were provided to us. Of these, the following six facilities with INRMPs were determined to overlap with the specific areas under consideration for critical habitat designation (all located in Puget Sound, WA): (1) Bremerton Naval Hospital; (2) Naval Air Station, Everett; (3) Naval Magazine Indian Island; (4) Naval Fuel Depot, Manchester; (5) Naval Undersea Warfare Center, Keyport; and (6) Naval Air Station, Whidbey Island. We reviewed the INRMPs for measures that would benefit green sturgeon. The INRMPs for four of the facilities (Bremerton Naval Hospital, NAS Everett, Naval Fuel Depot (Manchester), and Naval Magazine (Indian Island)) contain measures for listed salmon and bull trout that provide benefits for green sturgeon. The INRMPs for the two remaining facilities (NAS Whidbey Island and NUWC Keyport) do not contain specific requirements for listed salmon or bull trout, but also include measures that benefit fish species, including green sturgeon. Examples of the types of benefits include measures to control erosion, protect riparian zones and wetlands, minimize stormwater and construction impacts, and reduce contaminants. Based on these benefits provided for green sturgeon under the INRMPs, we determined that the areas within these six DOD facilities in Puget Sound, WA, were not eligible for designation as critical habitat.

During the public comment period, the DOD provided the INRMPs for two additional facilities that may overlap with the areas considered for designation as critical habitat: (1) Mare Island U.S. Army Reserve Center in Mare Strait, San Pablo Bay, CA; and (2) Military Ocean Terminal Concord (MOTCO), located in Suisun Bay, CA. Upon review of the INRMPs for each facility and correspondence with DOD contacts, we determined that: (1) The INRMP for the Mare Island U.S. Army Reserve Center did not provide adequate protection for the Southern DPS of green sturgeon; and (2) the MOTCO facilities do not overlap with the specific area considered for designation as critical habitat in Suisun Bay. Thus, neither facility was considered ineligible for designation under section 4(a)(3)(B)(i) of the ESA (however, *see* ''Exclusions based on impacts on national security'' below).

**Application of ESA Section 4(b)(2)**

Section 4(b)(2) of the ESA requires the Secretary to consider the economic, national security, and any other relevant impacts of designating any particular area as critical habitat. Any particular area may be excluded from critical habitat if the Secretary determines that the benefits of excluding the area outweigh the benefits of designating the area. The Secretary may not exclude a particular area from designation if exclusion will result in the extinction of the species. Because the authority to exclude is discretionary, exclusion is

not required for any areas. In this final designation, the Secretary has applied his statutory discretion to exclude 14 occupied specific areas, 5 DOD areas, and Indian lands from the critical habitat designation where the benefits of exclusion outweigh the benefits of designation.

The first step in conducting the ESA section 4(b)(2) analysis is to identify the ''particular areas'' to be analyzed. Where we considered economic impacts and weighed the economic benefits of exclusion against the conservation benefits of designation, we used the same biologically-based ''specific areas'' we identified in the previous sections pursuant to section 3(5)(A) of the ESA (*e.g.,* the upper Sacramento River, the lower Sacramento River, the Delta, *etc.*). Delineating the ''particular areas'' as the same units as the ''specific areas'' allowed us to most effectively consider the conservation value of the different areas when balancing conservation benefits of designation against economic benefits of exclusion. Delineating particular areas based on impacts on national security or other relevant impacts (*e.g.,* impacts on Indian lands) was based on land ownership or control (*e.g.,* land controlled by the DOD within which national security impacts may exist, or Indian lands). No other relevant impacts were identified during the public comment period.

The next step in the ESA section 4(b)(2) analysis involves identification of the impacts of designation (*i.e.,* the benefits of designation and the benefits of exclusion). We then weigh the benefits of designation against the benefits of exclusion to identify areas where the benefits of exclusion outweigh the benefits of designation. These steps and the resulting list of areas excluded from designation are described in detail in the sections below.

**Impacts of Designation**

The primary impact of a critical habitat designation stems from the requirement under section 7(a)(2) of the ESA that Federal agencies insure their actions are not likely to result in the destruction or adverse modification of critical habitat. Determining this impact is complicated by the fact that section 7(a)(2) contains the overlapping requirement that Federal agencies must also ensure their actions are not likely to jeopardize the species' continued existence. One incremental impact of designation is the extent to which Federal agencies modify their actions to insure their actions are not likely to adversely modify the critical habitat of the species, beyond any modifications they would make because of the listing and the jeopardy requirement. When a modification would be required due to impacts to both the species and critical habitat, the impact of the designation may be co-extensive with the ESA listing of the species. Additional impacts of designation include State and local protections that may be triggered as a result of the designation and the benefits from educating the public about the importance of each area for species conservation. The benefits of designation were evaluated by considering the conservation value of each occupied specific area to the Southern DPS. In the ''Benefits of Designation'' section below, we discuss how the conservation values of the specific areas were assessed.

In determining the impacts of designation, we focused on the incremental change in Federal agency actions as a result of the critical habitat designation and the adverse modification prohibition, beyond the changes predicted to occur as a result of listing and the jeopardy provision. In recent critical habitat designations for salmon and steelhead and for Southern Resident killer whales, the ''co-extensive'' impact of designation was considered in accordance with a Tenth Circuit Court decision (*New Mexico Cattle Growers Association* v. *U.S. Fish and Wildlife Service,* 248 F.3d 1277 (10th Cir. 2001)) (*NMCA*). The ''co-extensive'' impact of designation considers the predicted change in the Federal agency action resulting from the critical habitat designation and the adverse modification prohibition (whereby the action's effect on the PCEs and the value of the habitat is analyzed), even if the same change would result from application of the listing and the jeopardy provision (whereby the action's effect on the species itself and individual members of the species is analyzed). Shortly after the *NMCA* decision, however, the Court of Appeals for the Fifth Circuit (*Sierra Club* v. *U.S. Fish and Wildlife Service,* 243 F.3d 434 (5th Cir. 2001) (*Sierra Club*) and the Court of Appeals for the Ninth Circuit (*Gifford Pinchot Task Force* v. *FWS,* 378 F.3d 1059 (9th Cir. 2004)) (*Gifford Pinchot*) invalidated our regulatory definition of ''adverse modification'' of critical habitat. Following that decision, a District Court in Washington, DC issued a decision involving the USFWS's critical habitat designation for the piping plover (*Cape Hatteras Access Preservation Alliance* v. *Norton,* 344 F. Supp. 2d 1080 (D.D.C. 2004)) (*Cape Hatteras*). In that decision, the Court reasoned that the impact of a regulation should be based on a comparison of the world with and without the action, and that the effects of listing and the jeopardy provision should not be considered as part of the impacts of a designation in the ESA 4(b)(2) analysis for a critical habitat designation.

Consistent with the *Cape Hatteras* decision, we estimated and analyzed the incremental impacts of designation, beyond the impacts that would result from the listing and jeopardy provision. Uncertainties exist with regard to future management actions associated with green sturgeon critical habitat, because of the short consultation history for green sturgeon and overlap with protections provided under the listing. Due to these uncertainties, it was difficult to exclude potential impacts that may already occur under the baseline (*i.e.,* protections already afforded green sturgeon under its listing or under other Federal, State, and local regulations, such as protections for other listed species). Thus, the analysis included some impacts that would have occurred under the baseline regardless of the critical habitat rule. As such, the impacts are more correctly characterized as green sturgeon conservation impacts as opposed to exclusively incremental impacts of the critical habitat designation. That is, the impacts analyzed are those associated with the conservation of green sturgeon critical habitat, some of which may overlap with impacts resulting from the baseline protections. Our methods for estimating the impacts of designation for economic impacts, impacts on national security, and impacts on Indian lands are summarized in the sections below titled ''Determining the Benefits of Excluding Particular Areas.''

Because section 4(b)(2) requires a balancing of competing considerations, we must uniformly consider impacts and benefits. We recognize that excluding an area from designation will not likely avoid all of the impacts because the jeopardy provision under section 7 still applies. Similarly, much of the section 7 benefit would still apply as well.

A final economic analysis report (Indecon 2009) describes in more detail the types of activities that may be affected by the designation, the potential range of changes we might seek in those actions, and the estimated economic impacts that might result from such changes. A final biological report (NMFS 2009a) describes in detail the CHRT's evaluation of the conservation value of each specific area and reports the final conservation value ratings. The final ESA section 4(b)(2) report (NMFS 2009c) describes the analysis of all

impacts and the weighing of the benefits of designation against the benefits of exclusion for each area. All of these reports are available on the NMFS Southwest Region Web site at *http://swr.nmfs.noaa.gov/,* on the Federal E–Rulemaking Web site at *http://www.regulations.gov,* or upon request (*see* **ADDRESSES**).

**Benefits of Designation**

The primary benefit of designation is the protection afforded under section 7 of the ESA, requiring all Federal agencies to insure their actions are not likely to destroy or adversely modify designated critical habitat. This is in addition to the requirement that all Federal agencies ensure their actions are not likely to jeopardize the continued existence of the species. In addition, the designation may provide education and outreach benefits by informing the public about areas and features important to species conservation. By delineating areas of high conservation value, the designation may help focus and contribute to conservation efforts for green sturgeon and their habitats.

These benefits are not directly comparable to the costs of designation for purposes of conducting the ESA section 4(b)(2) analysis described below. Ideally, the benefits should be monetized. With sufficient information, it may be possible to monetize the benefits of a critical habitat designation by first quantifying the benefits expected from an ESA section 7 consultation and translating that into dollars. We are not aware, however, of any available data that would support such an analysis for green sturgeon (*e.g.,* estimates of the monetary value associated with conserving the PCEs within areas designated as critical habitat, or with education and outreach benefits). As an alternative approach, we used the CHRT's conservation value ratings to represent the qualitative conservation benefits of designation for each of the particular areas identified as critical habitat for the Southern DPS (*see* the section titled Methods for Assessment of Specific Areas). These conservation value ratings represent the estimated incremental benefit of designating critical habitat for the species. In evaluating the conservation value of each specific area, the CHRT focused on the habitat features and functions provided by each area and the importance of protecting the habitat for the overall conservation of the species. The final biological report (NMFS 2009a) sets forth detailed information on the qualitative conservation benefits of the specific areas proposed for designation, which is summarized briefly in the following paragraphs.

**Methods for Assessment of Specific Areas**

After identifying the PCEs, the geographical area occupied, and the specific areas, the CHRT scored and rated the relative conservation value of each occupied specific area. The conservation value ratings provided an assessment of the relative importance of each specific area to the conservation of the Southern DPS. Areas rated as ''High'' were deemed to have a high likelihood of promoting the conservation of the Southern DPS. Areas rated as ''Medium'' or ''Low'' were deemed to have a moderate or low likelihood of promoting the conservation of the Southern DPS, respectively. The CHRT considered several factors in assigning the conservation value ratings, including the PCEs present, the condition of the PCEs, the life stages and habitat functions supported, and the historical, present, and potential future use of the area by green sturgeon. These factors were scored by the CHRT and summed to generate a total score for each specific area, which was considered in the CHRT's evaluation and assignment of the final conservation value ratings.

The CHRT also considered the importance of connectivity among habitats in order for green sturgeon to access upstream spawning sites in the Sacramento River and oversummering and overwintering habitats in coastal bays and estuaries. In addition to providing high-value habitat, the San Francisco, San Pablo, and Suisun bays and the Delta contain high-value connectivity corridors for green sturgeon migration to and from upstream spawning grounds in the Sacramento River. Specific areas in coastal marine waters may provide low to medium value habitat for green sturgeon based on the PCEs present, but contain high-value connectivity corridors for green sturgeon migrating out of the San Francisco Bay system to bays and estuaries in California, Oregon, Washington, and Canada. The CHRT recognized that even within an area of Low to Medium conservation value, the presence of a connectivity corridor that provides passage to high value areas would warrant increasing the overall conservation value of the area to a High. To account for this, a separate conservation value rating was assigned to areas containing a connectivity corridor, equal to the rating of the highest-rated area for which it served as a connectivity corridor.

Members of the CHRT were then asked to re-examine the conservation value ratings for the specific areas where the presence of Southern DPS green sturgeon is likely (based on the presence of Northern DPS fish or green sturgeon of unknown origin), but not confirmed. These areas include the coastal marine waters within 60 fm depth from the California/Mexico border to Monterey Bay, CA, and from Yakutat Bay, AK, to the Bering Strait (including the Bering Sea), as well as the following coastal bays and estuaries: Elkhorn Slough, Tomales Bay, Noyo Harbor, the Eel River estuary, and the Klamath/Trinity River estuary in California; and the Rogue River estuary, Siuslaw River estuary, Alsea River estuary, Tillamook Bay, and Nehalem Bay in Oregon. Although these areas are considered occupied for the reasons provided above, the CHRT recognized that a lack of documented evidence for Southern DPS presence (perhaps because of the lack of monitoring or sampling effort within these areas) is indicative of a high degree of uncertainty as to the extent to which Southern DPS fish use these areas. In most of these areas, there are also few observations of green sturgeon both historically and presently. The CHRT scored all of these areas, except for Tomales Bay, Tillamook Bay, and Nehalem Bay, much lower than other areas, reflecting the CHRT's assessment that these areas contribute relatively little to the conservation of the species. For the bays and estuaries, this was based on the limited area and depth to support green sturgeon migration and feeding, as well as the low use by green sturgeon. Tomales Bay was given a higher score and rated as ''Medium,'' because it is a large, deep embayment providing good habitat for feeding by green sturgeon and is likely the first major bay to be encountered by subadults making their first migration into marine waters. Tillamook Bay and Nehalem Bay were both rated as ''Medium'' based on relatively high green sturgeon catch data for these areas (ODFW 2009a, b) and information indicating good habitat conditions for green sturgeon. Green sturgeon are more commonly observed in the Eel River estuary, Klamath/Trinity River estuary, and Rogue River estuary, but are presumed to primarily belong to the Northern DPS. Again, there is great uncertainty as to the extent of use of these estuaries by Southern DPS fish. The coastal marine waters south of Monterey Bay, CA, and northwest of Yakutat Bay, AK, are outside of the connectivity corridor identified by the

CHRT and also lack confirmed Southern DPS presence. Although the CHRT did not include the area in southeast Alaska up to Yakutat Bay, AK, as part of the primary migratory corridor, this area was rated as ''Medium'' because it represents the northern extent of the area containing important overwintering grounds for Southern DPS green sturgeon (Lindley *et al.* 2008). Based on this information, the CHRT agreed that the conservation value ratings should be reduced by one rating for these specific areas where the presence of the Southern DPS is likely, but not confirmed. This necessitated the creation of a fourth conservation value rating (''Ultra-low''). Those specific areas that initially received a ''Low'' rating were assigned a final conservation value rating of ''Ultra-low,''and those that initially received a ''Medium'' rating were assigned a final conservation value rating of ''Low.'' None of the specific areas where the presence of Southern DPS fish was likely but not confirmed had received a rating of ''High.'' Yaquina Bay, OR, was one of the areas rated as ''Ultra-Low'' in the proposed rule, but additional information was provided confirming the presence of Southern DPS green sturgeon in Yaquina Bay (pers. comm. with Dan Erickson, ODFW, September 3, 2008), and the conservation value rating for this area remained a ''Low''.

The final conservation ratings and the justifications for each specific area are summarized in the final biological report (NMFS 2009a; available via our Web site at *http://swr.nmfs.noaa.gov,* via the Federal eRulemaking Web site at *http://www.regulations.gov*, or upon request—*see* **ADDRESSES**). The CHRT recognized that even within a rating category, variation exists. For example, freshwater riverine areas rated as ''High'' may be of greater conservation value to the species than coastal marine areas with the same rating. This variation was captured in the comments provided by the CHRT members for each specific area. The final biological report describes in detail the evaluation process used by the CHRT to assess the specific areas, as well as the biological information supporting the CHRT's assessment.

**Determining the Benefits of Excluding Particular Areas: Economic Impacts**

To determine the benefits of excluding particular areas from designation, we first considered the Federal activities that may be subject to an ESA section 7 consultation and the range of potential changes that may be required for each of these activities under the adverse modification provision, regardless of whether those changes may also be required under the jeopardy provision. These consultation and project modification costs represent the economic benefits of excluding each particular area (that is, the economic costs that would be avoided if an area were excluded from the designation).

The CHRT identified and examined the types of Federal activities that occur within each of the specific areas and that may affect Southern DPS green sturgeon and the critical habitat (also *see* the section on ''Special Management Considerations or Protection''). Because the Southern DPS was recently listed under the ESA in 2006, we lack an extensive consultation history. Thus, the CHRT relied on NMFS' experience in conducting ESA section 7 consultations and their best professional judgment to identify the types of Federal activities that might trigger a section 7 consultation. The best available information was used to predict the number of these types of activities within the areas considered for designation as critical habitat. However, we recognize that some of these activities, in particular alternative energy hydrokinetic projects, are relatively new and anticipated to increase in number in the future. Additional information was received regarding proposed LNG and alternative energy hydrokinetic projects within the specific areas considered for designation as critical habitat and was included in the final economic analysis report. In the face of remaining uncertainties, however, a conservative approach was taken in the economic analysis by assuming that all of the proposed projects would be completed. Thus, the number of activities and their estimated costs are likely overestimated, because we do not expect all of the proposed projects to be completed.

Next, the range of modifications we might seek in these activities to avoid destroying or adversely modifying critical habitat of the Southern DPS was considered. Because of the limited consultation history, we relied on information from consultations conducted for salmon and steelhead, comments received during green sturgeon public scoping workshops conducted for the development of protective regulations, and information from green sturgeon and section 7 biologists to determine the types of activities and potential range of changes. We recognize that differences exist between the biology of Southern DPS green sturgeon and listed salmonids, but that there is also overlap in the types of habitat they use, their life history strategies and their behavior. As discussed in the final economic analysis report (Indecon 2009), the occupied geographical range and the specific areas considered for designation as critical habitat for the Southern DPS largely overlaps with the distribution and designated critical habitat of listed salmonids. Every consultation of the approximately 49 completed formal consultations addressing impacts on green sturgeon in California, Oregon, and Washington through May 2009 also address impacts to one or more listed salmon or steelhead species. In several consultations, the recommended conservation measures to address effects on green sturgeon and listed salmonids were the same or similar. It is important to note, however, that differences do exist between green sturgeon and salmonids that may require different conservation measures. For example, juvenile green sturgeon occupy the Delta and the San Francisco, San Pablo, and Suisun bays in California throughout all months of the year, for as long as one to three years before they disperse into marine waters. In contrast, the presence of juvenile salmon or steelhead in the Delta and bays is limited to certain months of the year. In addition, the feeding behavior and spawning requirements of green sturgeon subadults and adults may differ from that of listed salmonids. For example, subadult and adult green sturgeon make extensive use of summer feeding habitats in coastal estuaries in California, Oregon, and Washington. During their spawning migrations, adult green sturgeon likely have different water flow, temperature, and passage requirements compared to listed salmonids. We recognized these differences, but, given the limited amount of direct information regarding the types of modifications we might seek to avoid adverse modification of Southern DPS critical habitat, we also recognized that the information available for analog species (*i.e.,* listed salmonids) was the best information available to guide our decision-making. As demonstrated by our recent consultation history, the conservation measures implemented for green sturgeon in the early stages of its listing history are likely to be the same or similar to those implemented for listed salmonids. Additional information on differences in the habitat needs, life history strategies, and behavior of these species may allow us to refine our analysis.

A number of uncertainties exist in this stage of the analysis. First, we recognize there is uncertainty regarding the potential effects of activities on

green sturgeon and the potential conservation measures that may be required, particularly for relatively new activities like LNG projects and alternative energy hydrokinetic projects. Second, as is the case for all of the categories of activities identified, the project-specific nature of ESA section 7 consultations creates another level of uncertainty that likely results in over- or under-estimation of the economic impacts. Finally, we attempted to focus on the incremental benefits of the critical habitat designation beyond the benefits already afforded to the Southern DPS under its listing and under other Federal, State, and local regulations. To do this, we tried to provide information on whether each impact is more closely associated with adverse modification or with jeopardy. It is difficult, however, to isolate conservation efforts resulting solely from critical habitat. Thus, as described above, the estimated economic impacts are more correctly characterized as green sturgeon conservation impacts rather than exclusively incremental impacts of the designation. In other words, the impacts analyzed are those associated with the conservation of green sturgeon critical habitat, some of which may overlap with impacts resulting from the baseline protections.

We were able to monetize estimates of the economic impacts resulting from a critical habitat designation; however, because of the limited consultation history for green sturgeon and uncertainty about specific management actions likely to be required under a consultation, there was a great degree of uncertainty in the cost estimates for some specific areas. Several factors were considered in developing the estimated economic impacts, including the level of economic activity within each area, the level of baseline protection afforded to green sturgeon by existing regulations for each economic activity within each area, and the estimated economic impact (in dollars) associated with each activity type. The baseline included the protections afforded to green sturgeon by the listing and jeopardy provision, as well as protections provided for salmon and steelhead and their critical habitat including existing laws, regulations, and initiatives. Estimates of the economic costs were based on project modifications that might be required during consultation to avoid the destruction or adverse modification of critical habitat (*see* final economic analysis report for additional details). To focus on the incremental impacts of the critical habitat designation, the economic cost estimates were multiplied by a probability score (assigned for each specific area and economic activity type), representing the probability that green sturgeon critical habitat is a primary driver for the conservation effort. The final economic analysis report (Indecon 2009) provides detailed information on the economic impacts of designating particular areas as critical habitat, as well as consultation costs anticipated as a result of this proposed designation.

**Exclusions Based on Economic Impacts**

A final ESA section 4(b)(2) report (NMFS 2009c) describes in detail our approach to weighing the benefit of designation against the economic benefit of exclusion. The results of our analysis contained in this report are summarized below.

The benefits associated with species conservation are not directly comparable to the economic benefit that would result if an area were excluded from designation. We had sufficient information to monetize the economic benefits of excluding an area, but were not able to monetize the conservation benefits of designating an area. Thus, for each area we compared the qualitative final conservation value against the monetary economic impact estimate to determine if the cost estimate exceeded a threshold dollar amount. To make this comparison, we selected dollar thresholds for each conservation value rating above which the potential economic impact associated with a specific area appeared to outweigh the potential conservation benefits of designating that area. We determined these dollar thresholds by first examining the range in economic impacts across all specific areas within a conservation value rating category and then determining where the breakpoint occurred between relatively low economic impacts and relative high economic impacts. We then selected a dollar value within the range of that breakpoint as the threshold at which the economic impacts may outweigh the benefits of designation for the area.

Using this method, we developed and applied four decision rules to identify areas eligible for exclusion: (1) All areas with a conservation value rating of ''High'' were not eligible for exclusion, because we determined that the estimated economic benefits of exclusion for these areas would not outweigh the conservation benefits of designation, based on the threatened status of the Southern DPS of green sturgeon and the likelihood that exclusion of areas with a High conservation value would significantly impede conservation of the species; (2) areas with a conservation value rating of ''Medium'' were potentially eligible for exclusion if the estimated economic impact exceeded $100,000; (3) areas with a conservation value rating of ''Low'' were potentially eligible for exclusion if the estimated economic impact exceeded $10,000; and (4) areas with a conservation value rating of ''Ultra-low'' were potentially eligible for exclusion if the estimated economic impact exceeded $0 (*see* final ESA section 4(b)(2) Report for additional details). These dollar thresholds do not represent an objective judgment that Medium-value areas are worth no more than $100,000, Low-value areas are worth no more than $10,000, or Ultra-Low value areas are worth $0. The ESA emphasizes that the decision to exclude is discretionary. Thus, the economic impact level at which the economic benefits of exclusion outweigh the conservation benefits of designation is a matter of discretion and depends on the policy context. For critical habitat, the ESA provides NMFS the discretion to consider exclusions where the benefits of exclusion outweigh the benefits of designation, as long as exclusion does not result in extinction of the species. In this policy context, we selected dollar thresholds representing the levels at which the economic impact associated with a specific area may outweigh the conservation benefits of designating that area. These dollar thresholds and decision rules provided a relatively simple process to identify, in a limited amount of time, specific areas warranting consideration for exclusion.

Based on this analysis, we identified 18 occupied areas as eligible for exclusion, including Medium, Low, and Ultra-Low conservation value areas. The Medium conservation value areas eligible for exclusion included: the Yolo Bypass, lower Feather River, and lower Yuba River in California; Coos Bay in Oregon; Puget Sound in Washington; and coastal marine waters within 60 fm depth from the U.S.-Alaska/Canada border to Yakutat Bay, AK. The Low conservation value areas eligible for exclusion included: Tomales Bay in California; Tillamook Bay in Oregon; and the lower Columbia River (from RKM 74 to the Bonneville Dam at RKM 146). The Ultra-Low conservation value areas eligible for exclusion included: Elkhorn Slough, Noyo Harbor, Eel River estuary, and Klamath/Trinity River estuary in California; the Rogue River estuary, Siuslaw River estuary, and Alsea River estuary in Oregon; and coastal marine waters within 60 fm depth from the CA-Mexico border to Monterey Bay, CA, and northwest

Yakutat Bay, AK, to the Bering Strait (including the Bering Sea). All of these areas were eligible for exclusion in the proposed rule, except for the Yolo Bypass, lower Yuba River, and the lower Columbia River.

We then presented these 18 areas to the CHRT for their review. To further characterize the conservation benefit of designation for each area, we asked the CHRT to determine whether excluding any of the areas eligible for exclusion would significantly impede conservation of the Southern DPS. The CHRT considered this question in the context of all of the areas eligible for exclusion, as well as the information they had developed in determining the conservation value ratings. If the CHRT determined that exclusion of an area would significantly impede conservation of the Southern DPS, the conservation benefits of designation were increased one level in the weighing process.

The CHRT determined, and we concur, for the reasons described by the CHRT, that exclusion of the following 12 specific areas eligible for exclusion would not significantly impede conservation or result in extinction of the species: Elkhorn Slough, Tomales Bay, Noyo Harbor, Eel River estuary, and Klamath/Trinity River estuary in California; the Rogue River estuary, Siuslaw River estuary, Alsea River estuary, and Tillamook Bay in Oregon; the lower Columbia River (from RKM 74 to the Bonneville Dam); and coastal marine waters within 60 fm depth from the U.S.-California/Mexico border to Monterey Bay, CA, and northwest of Yakutat Bay, AK, to the Bering Strait (including the Bering Sea). The CHRT based their determination on the fact that each of these 12 specific areas was assigned a Low or Ultra-low final conservation value and Southern DPS green sturgeon have not been documented to use these areas extensively. The CHRT recognized that the apparent low use by Southern DPS green sturgeon of these bays and estuaries listed above may be because: (1) Most are small systems compared to other bays and estuaries that are used extensively and consequently received higher conservation ratings; and (2) Southern DPS fish do not appear to use Northern DPS spawning systems extensively. In addition, few green sturgeon (of unknown DPS) have been observed in the coastal marine waters within 60 fm depth from the U.S.-California/Mexico border to Monterey Bay, CA, and northwest of Yakutat Bay, AK, to the Bering Strait (including the Bering Sea). For these reasons, the CHRT concluded that excluding the bays, estuaries, and coastal marine areas mentioned above from the designation would not significantly impede conservation of the Southern DPS nor result in extinction of the species. Thus, these 12 areas are excluded from the critical habitat designation for the Southern DPS. We recognize that the lack of documented evidence for Southern DPS presence in these areas may be because these areas are not adequately monitored for green sturgeon. We encourage directed surveys to be conducted in these areas to gather more information on green sturgeon presence and use. For example, the lower Columbia River (from RKM 74 to Bonneville Dam) may have been a historically important area for green sturgeon prior to the hydrographical changes that have occurred in the river and has the potential for being an important area in certain water years. Monitoring of green sturgeon upstream of RKM 74 would provide valuable information for future consideration of this area.

The CHRT re-evaluated the six areas of Medium conservation value that were eligible for exclusion (Yolo Bypass, lower Yuba River, lower Feather River, Coos Bay, Puget Sound, and coastal marine waters within 60 fm depth from the U.S.-Alaska/Canada border to Yakutat Bay, AK) to determine whether excluding these areas would significantly impede conservation of the Southern DPS.

The CHRT maintained their determination that exclusion of Puget Sound would not significantly impede conservation of the Southern DPS or result in extinction of the species. Observations of green sturgeon in Puget Sound are much less common compared to the other estuaries in Washington. Although two confirmed Southern DPS fish were detected there in 2006, the extent to which Southern DPS green sturgeon use Puget Sound remains uncertain. Puget Sound has a long history of commercial and recreational fishing and fishery-independent monitoring of other species that use habitats similar to those of green sturgeon, but very few green sturgeon have been observed there. In addition, Puget Sound does not appear to be part of the coastal migratory corridor that Southern DPS fish use to reach overwintering grounds north of Vancouver Island (pers. comm. with Steve Lindley, NMFS, and Mary Moser, NMFS, February 24–25, 2008), thus corroborating the assertion that Southern DPS do not use Puget Sound extensively. The economic cost of designating this area was well above the $100,000 threshold because of the large number of activities affecting sediment and water quality (*i.e.,* dredging, in-water construction, and point and non-point sources of pollution) that might require special management if critical habitat were to be designated. Thus, this final rule excludes Puget Sound from the critical habitat designation for the Southern DPS, because the benefits of designation are outweighed by the economic benefits of exclusion. The exclusion of this area will not result in the extinction of the species.

The CHRT was unable to conclude that exclusion of the coastal marine waters within 60 fm depth from the Alaska/Canada border to Yakutat Bay, AK, would significantly impede conservation. The proposed rule had sought public comments regarding: (1) The presence of green sturgeon in coastal waters off southeast Alaska; (2) the spatial distribution of the PCEs in southeast Alaska; (3) activities occurring in the area that may affect the PCEs; (4) the types of changes that might be proposed for these activities to avoid impacts to the PCEs; and (5) estimated costs associated with making these changes. However, few comments were received regarding this area. In the proposed rule, some CHRT members noted that exclusion of this area from the designation might impede conservation of the Southern DPS, because this area is at the northern extent of the overwintering range and may provide important overwintering habitat for the species. The CHRT cited the detection of two tagged Southern DPS green sturgeon at the array in Graves Harbor, AK, despite the short monitoring period for this array (data are available only from 2005 to 2006) and the fact that the system is not positioned or programmed specifically for detecting green sturgeon. However, given that this is a relatively low number of Southern DPS detections compared to other areas and the level of uncertainty concerning activities occurring in southeast Alaska that may affect critical habitat (*i.e.,* proposed alternative energy projects and commercial shipping activities, both of which are associated with a high degree of uncertainty), the CHRT agreed that it is uncertain whether exclusion of this area would significantly impede conservation of the Southern DPS. Based on the CHRT's conclusion, we determined that the economic benefits of exclusion outweigh the conservation benefits of designation for this area. Thus, this area is excluded from the critical habitat designation.

The CHRT unanimously agreed that exclusion of the lower Feather River or lower Yuba River would significantly

impede conservation of the Southern DPS. The CHRT identified the lower Feather River as an important area for the conservation of the Southern DPS, because it has been consistently occupied by the species and most likely contains spawning habitat for the Southern DPS, potentially providing a spawning river for the Southern DPS in addition to the Sacramento River. The CHRT also considered the lower Yuba River an important area for green sturgeon that may contain spawning habitats. The CHRT had assigned both the lower Feather River and the lower Yuba River a Medium conservation value, but noted that future improvements to habitat conditions (*e.g.,* improved passage, restoration of water flow) would raise the conservation value to a High. Thus, the CHRT agreed that conservation of the species could not be achieved without the inclusion of the lower Feather River and lower Yuba River in the critical habitat designation, based on the importance of the lower Feather River and lower Yuba River as potential spawning rivers for the Southern DPS, their proximity to the Sacramento River, and the potential increased value of these two areas given certain characteristics of the habitat, the PCEs, and future habitat improvements. Based on the CHRT's conclusion, we increased the final conservation value for these two areas from Medium to High. In addition, the CHRT noted uncertainties in the economic impact estimates for these two areas. The economic cost estimates for these two areas had increased substantially from the draft economic analysis (lower Yuba River: from $53,000 to $600,000–$610,000; lower Feather River: from $770,000 to $2 million), making the economic costs well above the dollar threshold of $100,000. However, this increase is primarily attributed to two revisions to the economic analysis. First, economic costs associated with agricultural pesticide application increased substantially. The draft economic analysis had estimated the costs for applying a 60 ft buffer to agricultural pesticide application projects. Based on public comments received, the buffer was revised to a 1,000 ft buffer (consistent with recommendations in recent consultations for listed salmonids), resulting in large increases in economic costs. However, green sturgeon co-occur with listed salmonids species in all waterways where this 1,000 ft buffer would be applied. Thus, the 1,000 ft buffer would be applied for listed salmonids regardless of whether green sturgeon critical habitat exists in the area or not. Based on this reasoning, the incremental economic impacts estimated for agricultural pesticide application due to green sturgeon critical habitat is more likely closer to zero, rather than the $1.5 million estimated for the lower Feather River and the $228,000 estimated for the lower Yuba River. Second, for the lower Yuba River, the economic cost estimate for installing fish passage facilities at Daguerre Point Dam increased from $21,000 to $351,000. This was based on a public comment estimating that current passage plans at the dam for salmonids will cost $17.5 million to implement. The revised economic cost estimate of $351,000 for providing green sturgeon passage at Daguerre Point Dam was calculated by attributing 20 percent of the expected costs for salmonid passage plans to green sturgeon critical habitat (annualized over 20 years). It is uncertain whether this may be an overestimate or underestimate of costs. Thus, based on the importance of the lower Feather River and lower Yuba River to the conservation of the Southern DPS and the uncertainty with regard to the estimated economic costs, we determined that the benefits of excluding the lower Feather River and lower Yuba River do not outweigh the benefits of designating these particular areas and they should not be excluded based on economic impacts. The lower Feather River and lower Yuba River are included in the final designation.

The CHRT also agreed that exclusion of the Yolo Bypass would significantly impede conservation of the Southern DPS. The Yolo Bypass was assigned a Medium conservation value because it provides a migratory corridor to and from spawning habitats in the Sacramento River during high flow years. The area may be particularly important for juvenile Southern DPS green sturgeon that can use this shallow, productive, and protected off-channel area for rearing and feeding. The Yolo Bypass currently contains good habitat for supporting the Southern DPS, and the potential for the quality of this habitat to improve is likely if efforts to improve passage, reduce stranding risks, and improve water quality are made. Based on this information, the CHRT concluded that exclusion of this area would significantly impede conservation of the Southern DPS, and the final conservation value for the Yolo Bypass was increased from Medium to High. In addition, the CHRT noted that the economic impact estimate may be greatly overestimated for this area. The estimated economic impacts for the Yolo Bypass increased from the proposed rule to final rule stage, due to a large increase in the costs to address agricultural pesticide application. Increasing the buffer zone from 60 ft to 1000 ft resulted in an increase in the economic impacts for this area from $29,000 to $449,000, making this area eligible for exclusion. However, similar to the lower Yuba River and lower Feather River, green sturgeon co-occur with listed salmonids in this area and the 1000 ft buffer zone for agricultural pesticide application would likely be applied with or without the existence of green sturgeon critical habitat in the area. Thus, the incremental impact of green sturgeon critical habitat is more likely to be closer to zero rather than $449,000. Based on the importance of the Yolo Bypass to the Southern DPS and the likelihood that the economic impacts are overestimated, we determined that the benefits of excluding the Yolo Bypass particular area do not outweigh the benefits of designating the area and it therefore should not be excluded. Thus, the Yolo Bypass is included in the final critical habitat designation.

Finally, the CHRT reconfirmed its determination that exclusion of Coos Bay would significantly impede the conservation of the species. The CHRT identified Coos Bay as an important area for the Southern DPS because it is the largest and deepest estuary along the Oregon coast presently occupied by green sturgeon (including confirmed Southern DPS green sturgeon), has a large mixing zone, provides a protected area for green sturgeon aggregation and feeding, and is an important ''stepping-stone'' estuary between San Francisco Bay and the lower Columbia River estuary. Based on the CHRT's conclusion, the final conservation value for Coos Bay was increased from Medium to High. In addition, there is a great degree of uncertainty regarding the economic costs associated with a designation in this area. We had identified Coos Bay as potentially eligible for exclusion because the estimated economic impacts (ranging from $73,000 to $16 million) exceeded the threshold value over which an area was considered eligible for exclusion ($100,000 for areas with a Medium conservation value; this decision rule was applied prior to increasing the conservation value from Medium to High). The wide range in estimated costs was primarily due to the uncertainty regarding economic costs associated with a proposed LNG project within Coos Bay. This uncertainty was driven largely by the limited understanding of how LNG projects

would affect the PCEs and uncertainty regarding how LNG activities might be altered to avoid adverse modification of green sturgeon critical habitat. The low cost estimate of $73,000 assumes that this rule would not require any additional measures for LNG projects or that any additional measures would result in minimal costs (*i.e.,* the economic costs to LNG projects is $0). The high cost estimate of $16 million is based on the potential requirement to relocate the LNG project due to green sturgeon critical habitat in the area. However, NMFS has never required relocation as a result of an ESA section 7 consultation on an LNG facility, and it is unlikely that proposed modifications to the project in Coos Bay would include relocation. Because we consider both the low cost estimate and the high cost estimate to be highly unlikely, as stated above, we believe the economic impact to LNG projects would likely be greater than $0, but much lower than $16 million, but do not have sufficient information at this time to estimate those costs. Therefore, we concluded that the economic impacts associated with Coos Bay are likely to be greater than $73,000 but much lower than $16 million. Based on the importance of Coos Bay to the conservation of the Southern DPS and the uncertainty regarding the estimated economic impacts, we determine that the benefits of excluding Coos Bay do not outweigh the benefits of designating this particular area and it therefore should not be excluded. Thus, Coos Bay is included in the final critical habitat designation.

In summary, this final rule will exclude the following 14 specific areas from the critical habitat designation for Southern DPS green sturgeon: Elkhorn Slough, Tomales Bay, Noyo Harbor, the Eel River estuary, and the Klamath/Trinity River estuary in California; the Rogue River estuary, Siuslaw River estuary, Alsea River estuary, and Tillamook Bay in Oregon; the lower Columbia River (from RKM 74 to Bonneville Dam); Puget Sound in Washington; and coastal marine waters within 60 fm depth from the U.S.-California/Mexico border to Monterey Bay, CA, from the U.S.-Alaska/Canada border to Yakutat Bay, AK, and from Yakutat Bay northwest to the Bering Strait (including the Bering Sea). Based on the best scientific and commercial data available, we have determined that the exclusion of these 14 areas from the designation would not result in the extinction of the species.

**Determining the Benefits of Excluding Particular Areas: Impacts on National Security**

At the time of the proposed rule, we had not yet received any information from the DOD regarding impacts on national security within the specific areas considered for designation as critical habitat. During the public comment period and the development of the final rule, the DOD identified several areas that may warrant exclusion based on national security impacts and corresponded with us to evaluate these areas (Table 2). As in the analysis of economic impacts, we weighed the benefits of exclusion (*i.e.,* the impacts on national security that would be avoided) with the conservation benefits of designation.

The primary benefit of exclusion is that the DOD agency would not be required to consult with NMFS under section 7 of the ESA regarding DOD actions that may affect critical habitat, and thus potential delays or costs associated with conservation measures for critical habitat would be avoided. To assess the benefits of exclusion, we evaluated the intensity of use of the particular area by the DOD, the likelihood that DOD actions in the particular area would affect critical habitat and trigger an ESA section 7 consultation, and the potential conservation measures that may be required and that may result in delays or costs that affect national security. We also considered the level of protection provided to critical habitat by existing DOD safeguards, such as regulations to control public access and use of the area and other means by which the DOD may influence other Federal actions in the particular area.

The primary benefit of designation is the protection afforded green sturgeon under the ESA section 7 critical habitat provision. To evaluate the benefit of designation for each particular area, we considered the final conservation value of the specific area within which the particular area was contained, the best available information on green sturgeon presence in and use of the particular area, the size of the particular area compared to the specific area and the total critical habitat area, and the likelihood that other Federal actions occur in the area that may affect critical habitat and trigger a consultation.

Unlike in the economic analysis, neither the benefits of exclusion for impacts on national security nor the benefits of designation could be quantified. Instead, we used the best available information to evaluate and assign each of the factors considered under the benefits of exclusion and the benefits of designation with a High or Low rating and compared these qualitative ratings. A particular area was eligible for exclusion if the benefits of exclusion outweighed the benefits of designation.

TABLE 2—SUMMARY OF ASSESSMENT OF PARTICULAR AREAS REQUESTED FOR EXCLUSION BY THE DOD BASED ON IMPACTS ON NATIONAL SECURITY. LISTED FOR EACH PARTICULAR AREA IS: THE SPECIFIC AREA THAT THE PARTICULAR AREA OCCURS IN AND ITS CONSERVATION VALUE; THE SIZE OF THE SPECIFIC AREA; THE SIZE OF THE PARTICULAR AREA; AND WHETHER EXCLUSION BASED ON NATIONAL SECURITY IMPACTS IS WARRANTED

| DOD sites & agency | Overlapping specific area & conservation value | Specific area size ($km^2$) | DOD site overlap ($km^2$) | Exclude? |
|---|---|---|---|---|
| (1) Mare Island US Army Reserve (Army) | San Pablo Bay, CA (High) | 331.0 | 0.05 | Yes. |
| (2) Camp Rilea (Army) | Coastal marine area from Winchester Bay, OR, to Columbia R, estuary (High). | 6,796.9 | 20.3 | No. |
| (3) Admiralty Inlet Naval Restricted Area (Navy). | Strait of Juan de Fuca, WA (High) | 1,348.6 | 134.7 | Yes. |
| (4) Strait of Juan de Fuca & Whidbey Island Naval Restricted Area (Navy). | Strait of Juan de Fuca, WA (High) | 1,348.6 | 4.9 | Yes. |
| (5) Strait of Juan de Fuca Naval Air-to-Surface Weapon Range Restricted Area (Navy). | Strait of Juan de Fuca, WA (High) | 1,348.6 | 16.8 | Yes. |
| (6) Navy 3 Operating Area (Navy) | Strait of Juan de Fuca, WA (High) | 1,348.6 | 162.5 | Yes. |
| (7) Surf zone portion of Quinault Underwater Tracking Range (QUTR). | Coastal marine area from Grays Harbor, WA, to U.S.-WA/Canada border (High). | 4,923.5 | N/A | No. |

The DOD also identified the following three particular areas for exclusion based on impacts on national security, but these areas were not included in the ESA section 4(b)(2) analysis. First, the Army requested the exclusion of the Military Ocean Terminal Concord (MOTCO) facilities in Suisun Bay, CA. The MOTCO facilities are covered by an existing INRMP. This area was not analyzed because it was determined that the MOTCO facilities do not overlap with the specific area considered for designation as critical habitat in Suisun Bay. Second, the Navy requested the exclusion of the Navy 7/Admiralty Bay Naval Restricted Area 6701 in Puget Sound, WA. This area was not analyzed because it overlaps with the specific area in Puget Sound, WA, which will be excluded in the final designation. Finally, the Navy requested the exclusion of one of the proposed surf zone sites of the Pacific Northwest Operating Area Quinault Underwater Tracking Range (in the coastal marine area from Grays Harbor, WA, to the U.S.-WA/Canada border). This area was not analyzed, however, because the Navy has not yet made a final selection on the surf zone site location and the particular area has yet to be defined.

**Exclusions Based on Impacts on National Security**

The final ESA section 4(b)(2) report (NMFS 2009c) provides a detailed description of our analysis of the impacts on national security and our approach to weighing the benefits of designation against the benefits of exclusion. The results of our analysis are summarized in Table 2 and in the following paragraphs.

(1) *Mare Island U.S. Army Reserve (USAR) Center in San Pablo Bay, CA:* The area of overlap between the USAR facilities and the specific area in San Pablo Bay consists of the area between two piers and is very small (0.02 $mi^2$ or 0.02% of the San Pablo Bay specific area). The main activity of concern is the in-bay disposal of the dredged sediments from dredging activities between the piers. We determined that the INRMP does not provide adequate protection for the Southern DPS because it does not address concerns regarding in-bay disposal of dredged material. However, we determined that the benefits of excluding this area outweigh the benefits of designating it for two reasons. First, restrictions on dredging operations between the piers pose a national security risk (*i.e.,* build-up of sediment such that vessels cannot move in and out of the piers). The dredging activities are not a major concern to green sturgeon because the dredged area is small, the frequency of dredging is low (about once every 3 years), and the Army is already using the recommended dredge type. Second, we are primarily concerned about the use of in-bay disposal sites, which are located outside of the USAR area and would not be affected by this exclusion. We determine that the benefits of excluding the Mare Island USAR facilities outweigh the benefits of designation and that exclusion of this area would not significantly impede conservation for the previously described reasons (small area, infrequent dredging, and current use of recommended dredge type), and that exclusion of this area would not result in extinction of the species. Therefore, the area is excluded from the critical habitat designation.

(2) *Coastal marine waters adjacent to Camp Rilea, OR:* The Army requested the exclusion of coastal marine waters adjacent to Camp Rilea (Clatsop County, OR), delineated as an area one-half mile north to one-half mile south of Camp Rilea, to a distance of two miles offshore of Camp Rilea. The primary activities of concern identified by the Army that might affect critical habitat are amphibious landings operations and the rare occurrence of stray bullets entering the water within this particular area. We determined that neither amphibious landings nor a stray bullet entering the water would be likely to affect the critical habitat features identified for coastal marine areas (*i.e.,* prey resources, water quality, migratory corridors). Thus, based on the information provided by the Army, we determined there is a low likelihood that the Army's activities within the area would affect critical habitat and trigger an ESA section 7 consultation and, consequently, the benefit of exclusion for this area is low. In contrast, the benefits of designation are likely high for this area because it occurs within a High conservation value specific area just south of the lower Columbia River estuary and our consultation history indicates that there are other Federal activities occurring in this area that may affect critical habitat and trigger a consultation under section 7 of the ESA. For these reasons, we determined that the benefits of exclusion do not outweigh the benefits of designation for this area and that the area will be included in the critical habitat designation.

(3) *Three naval restricted areas and one operating area located in the Strait of Juan de Fuca, WA:* The Navy requested the exclusion of 3 naval restricted areas and one operating area (Navy 3 OPAREA) in the eastern portion of the Strait of Juan de Fuca. We corresponded with the Navy extensively throughout the analysis of national security impacts, to better define the impacts on national security and the Navy's control of the particular areas requested for exclusion.

We determined that the benefits of designation for these areas is low. Although the Strait of Juan de Fuca received a High conservation value, this was based on the existence of a connectivity corridor within this area. From observations of tagged green sturgeon, it appears that the eastern portion of the Strait of Juan de Fuca is used at a lower frequency than the western portion of the Strait. In addition, the areas are small compared to the critical habitat areas being designated, our consultation history indicates that there are currently no other Federal activities occurring within these particular areas that may affect critical habitat, and the Navy's limits on public access in restricted areas and presence in operating areas (which are likely to deter certain activities from the area) provide some protection for green sturgeon and its habitat in the areas. Based on the information provided by the Navy, we also determined that the benefits to national security of excluding these areas is low, because the Navy's current activities within the areas have a low likelihood of affecting critical habitat and triggering a section 7 consultation. However, we recognize that the range of activities that may be carried out in these areas are often critical to national security and that a critical habitat designation in these areas could delay or halt these activities in the future. Therefore, we determined that the benefits of exclusion outweigh the benefits of designation for the three naval restricted areas and the Navy 3 Operation Area within the Strait of Juan de Fuca. We also determined that exclusion of these areas would not significantly impede conservation or result in extinction of the species. Thus, the 4 areas requested for exclusion by the Navy in the Strait of Juan de Fuca are excluded from the final designation.

**Determining the Benefits of Excluding Particular Areas: Impacts on Indian Lands**

The only other relevant impacts identified for the ESA section 4(b)(2) analysis were impacts on Indian lands. In the proposed rule, we solicited comments regarding lands owned by the following Federally-recognized Tribes (73 FR 18553, April 4, 2008) that may be in close proximity to areas considered for designation as critical habitat for Southern DPS green sturgeon: the Hoh, Jamestown

S'Klallam, Lower Elwha, Makah, Quileute, Quinault, and Shoalwater Bay Tribes in Washington; the Confederated Tribes of Coos Lower Umpqua and Siuslaw Indians and the Coquille Tribe in Oregon; and the Cachil DeHe Band of Wintun Indians of the Colusa Indian Community, Wiyot Tribe, and Yurok Tribe in California. We later also identified lands owned by the Trinidad Rancheria that may overlap with the critical habitat areas in California. We corresponded with these Tribes during the public comment period and development of the final rule to confirm where their lands occur and may overlap with the areas considered for designation as critical habitat and to understand the Tribal activities and concerns within those areas. We then analyzed and determined whether the benefits of exclusion outweigh the benefits of designation for these identified Indian lands under ESA section 4(b)(2). Because we were unable to quantify the benefits, we instead compared qualitative ratings of the benefits of exclusion and benefits of designation.

The primary benefit of designation is the protection provided under section 7 of the ESA, requiring every Federal agency to ensure that any action it authorizes, funds, or carries out is not likely to result in the destruction or adverse modification of the designated critical habitat. To assess the benefit of designation, we considered the final conservation value of the specific area within which the overlap with Indian lands occur (*i.e.,* the greater the conservation value of an area, the greater the benefit of protection under section 7 of the ESA), the Federal actions likely to occur within the area that may affect critical habitat, and the size of the area of overlap. The conservation values of the specific areas included High and Medium (none of the areas had Low or Ultra-Low conservation value). Federal actions occurring in the areas that may trigger a section 7 consultation include transportation projects, alternative energy hydrokinetic projects, in-water construction or alterations, NPDES activities, and dredging. However, the area of overlap between Indian lands and the areas considered for designation as critical habitat is very small and we anticipate there would be very few Federal actions undergoing a section 7 consultation in these areas. Thus, we determine that the benefit of designation for these Indian lands is relatively low.

To determine the benefits of exclusion, we evaluated the Tribal activities conducted within the areas and the Federal government's policies regarding Indian lands and relationships with the Tribes. Indian lands are those defined in the Secretarial Order ''American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act'' (June 5, 1997), including: (1) Lands held in trust by the United States for the benefit of any Indian Tribe; (2) land held in trust by the United States for any Indian Tribe or individual subject to restrictions by the United States against alienation; (3) fee lands, either within or outside the reservation boundaries, owned by the Tribal government; and (4) fee lands within the reservation boundaries owned by individual Indians. Activities within Indian lands include many activities that may affect critical habitat, including fisheries activities, in-water construction or alterations, energy projects, and habitat restoration. The benefits of exclusion would include avoiding the need to consult with NMFS under section 7 of the ESA for activities that may affect critical habitat, as well as the benefits identified in recent critical habitat designations for Pacific salmon and steelhead (70 FR 52630; September 2, 2005), specifically: (1) The furtherance of established national policies, our Federal trust obligations and our deference to the Tribes in management of natural resources on their lands; (2) the maintenance of effective long-term working relationships to promote species conservation on an ecosystem-wide basis; (3) the allowance for continued meaningful collaboration and cooperation in scientific work to learn more about the conservation needs of the species on an ecosystem-wide basis; and (4) continued respect for Tribal sovereignty over management of natural resources on Indian lands through established Tribal natural resource programs. Thus, we determine that the benefit of exclusion for Indian lands is relatively high.

**Exclusions Based on Impacts on Indian Lands**

The final ESA section 4(b)(2) analysis report provides a detailed description of our approach and analysis of impacts on Indian lands. Based on the analysis of the benefits of designation and exclusion described above and in the report, we determined that the benefits of excluding the identified Indian lands outweigh the benefits of designating those lands. Exclusion of Indian lands benefits the Federal government's policy of promoting respect for Tribal sovereignty and self-governance. In addition, critical habitat on Indian lands represents such a small proportion of total critical habitat. Because the percentage of critical habitat on Indian lands is minimal, we determined that exclusion would not significantly impede conservation or result in extinction of the Southern DPS. Table 3 lists the Tribes whose lands are excluded from the critical habitat designation and the estimated area of overlap that is excluded.

We also received comments from Tribes in Washington requesting the exclusion of usual and accustomed fishing areas from the critical habitat designation. The Tribes were primarily concerned about the potential impact of the critical habitat designation on Tribal fisheries within usual and accustomed fishing areas located in coastal estuaries and coastal marine waters. Based on the information provided by the Tribes, we would expect the critical habitat designation to have minimal effects on Tribal fisheries. Tribal fisheries may cause take of Southern DPS green sturgeon and thus are more likely to be affected by take prohibitions as established in the proposed ESA 4(d) Rule for green sturgeon (74 FR 23822; May 21, 2009) than by the critical habitat designation. In addition, and as described below, usual and accustomed fishing areas are not necessarily coextensive with areas defined as ''Indian lands'' in various Federal policies, orders, and memoranda. Thus, we conclude that exclusion of usual and accustomed fishing areas outside those identified as Indian lands is not warranted, because the benefits of exclusion do not outweigh the benefits of designation for these areas.

TABLE 3—SUMMARY OF THE TRIBES WITH LANDS OVERLAPPING WITH THE CRITICAL HABITAT DESIGNATION, THE SPECIFIC AREA WHERE THE OVERLAP OCCURS AND ITS ASSOCIATED CONSERVATION VALUE RATING, AND THE ESTIMATED AREA OF OVERLAP BETWEEN INDIAN LANDS AND THE SPECIFIC AREA

| Tribe** | Specific area & conservation value | Estimated km of excluded shoreline |
|---|---|---|
| Cachil DeHe Band of Wintun Indians of the Colusa Indian Community, CA. | Sacramento River, CA (High) | 0.2 |
| Cher-Ae Heights Trinidad Rancheria | Coastal marine area from Humboldt Bay, CA, to Coos Bay, OR (High) | 0.6 |
| Confederated Tribes of the Coos, Lower Umpqua, and Siuslaw, OR. | (a) Coos Bay, OR (Medium) and (b) coastal marine area from Humboldt Bay, CA, to Coos Bay, OR (High). | 1.1 (total), (a) 0.3, (b) 0.8 |
| Coquille Indian Tribe | Coos Bay, OR (Medium) | 2.6 |
| Hoh Tribe | Coastal marine area from Grays Harbor, WA, to Cape Flattery (High) | 2.6 |
| Jamestown S'Klallam Tribe | Strait of Juan de Fuca, WA (High) | <0.1 |
| Lower Elwha Tribe | Strait of Juan de Fuca, WA (High) | 1.8 |
| Makah Tribe | (a) Strait of Juan de Fuca, WA (High) and (b) coastal marine area from Grays Harbor, WA, to Cape Flattery (High). | 40.4 (total), (a) 19.2, (b) 21.2 |
| Quileute Tribe | Coastal marine area from Grays Harbor, WA, to Cape Flattery (specifically, Quillayute River) (High). | 3.9 |
| Quinault Tribe | Coastal marine area from Grays Harbor, WA, to Cape Flattery (High) | 40.6 |
| Shoalwater Bay Tribe | Willapa Bay, WA (High) | 3.1 |
| Wiyot Tribe | Humboldt Bay, CA (Medium) | 1.8 |
| Yurok Tribe | Coastal marine area from Humboldt Bay, CA, to Coos Bay, OR (High) | 1.4 |

**We also corresponded with the Lummi Tribe and Swinomish Tribe in Washington, but determined that their Indian lands do not overlap with the specific areas considered for designation as critical habitat.

**Critical Habitat Designation**

This final rule will designate approximately 515 km (320 mi) of riverine habitat and 2,323 km² (897 mi²) of estuarine habitat in California, Oregon, and Washington, and 29,581 km² (11,421 mi²) of coastal marine habitat off California, Oregon, and Washington within the geographical area presently occupied by the Southern DPS of green sturgeon. We are also designating approximately 784 km (487 mi) of habitat in the Sacramento-San Joaquin Delta, and 350 km² (135 mi²) of habitat within the Yolo and Sutter bypasses, adjacent to the Sacramento River, California. These critical habitat areas contain physical or biological features essential to the conservation of the species that may require special management considerations or protection. This final rule will exclude from the designation: (1) 14 specific areas based on economic impacts; (2) the Mare Island USAR Center in San Pablo Bay, three naval restricted areas in the Strait of Juan de Fuca, and one Navy operating area in the Strait of Juan de Fuca based on impacts on national security; and (3) Indian lands owned by 12 Federal-recognized Tribes that overlap with the critical habitat designation, based on impacts on Indian lands. We conclude that the exclusion of these areas will not result in the extinction of the Southern DPS. Although we have identified 7 presently unoccupied areas that may, at a later time, be determined as essential to conservation, we are not designating any unoccupied areas at this time, because we do not have sufficient information showing that any of the unoccupied areas are essential to the conservation of the species.

**Lateral Extent of Critical Habitat**

For freshwater riverine habitats, we described the lateral extent of critical habitat units as the width of the stream channel defined by the ordinary high-water line, as defined by the U.S. Army Corps of Engineers (ACOE) in 33 CFR 329.11. The ordinary high-water line on non-tidal rivers is defined as ''the line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank; shelving; changes in the character of soil; destruction of terrestrial vegetation; the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas'' (33 CFR 329.11(a)(1)). In areas for which the ordinary high-water line has not been defined pursuant to 33 CFR 329.11, we defined the width of the stream channel by its bankfull elevation. Bankfull elevation is the level at which water begins to leave the channel and move into the floodplain (Rosgen 1996) and is reached at a discharge which generally has a recurrence interval of 1 to 2 years on the annual flood series (Leopold *et al.* 1992). For bays and estuarine areas, we defined the lateral extent by the mean higher high water (MHHW) line. For coastal marine habitats, the lateral extent to the west is defined by the 60 fm depth bathymetry contour relative to the line of MLLW and shoreward to the area that is inundated by MLLW, or to the COLREGS demarcation lines delineating the boundary between estuarine and marine habitats. The textual descriptions of critical habitat in 50 CFR 226.215 (under ''Critical habitat for the Southern Distinct Population Segment of North American Green Sturgeon (Acipenser medirostris)'') are the definitive source for determining the critical habitat boundaries. The overview maps provided in 50 CFR 226.215 (under ''Critical habitat for the Southern Distinct Population Segment of North American Green Sturgeon (*Acipenser medirostris*)'') are provided for general guidance purposes only and not as a definitive source for determining critical habitat boundaries.

As discussed in previous critical habitat designations, the quality of aquatic and estuarine habitats within stream channels and bays and estuaries is intrinsically related to the adjacent riparian zones and floodplain, to surrounding wetlands and uplands, and to non-fish-bearing streams above occupied stream reaches. Human activities that occur outside of designated streams, bays, or estuaries can destroy or adversely modify the essential physical and biological features within these areas. In addition,

human activities occurring within and adjacent to reaches upstream or downstream of designated stream reaches or estuaries can also destroy or adversely modify the essential physical and biological features of these areas. Similarly, human activities that occur outside of designated coastal marine areas inundated by extreme high tide can destroy or adversely modify the essential physical and biological features of these areas. This designation will help to ensure that Federal agencies are aware of these important habitat linkages.

**Effects of Critical Habitat Designation**

**ESA Section 7 Consultation**

Section 7(a)(2) of the ESA requires Federal agencies, including NMFS, to insure that any action authorized, funded, or carried out by the agency (agency action) does not jeopardize the continued existence of any threatened or endangered species or destroy or adversely modify designated critical habitat.

When a species is listed or critical habitat is designated, Federal agencies must consult with NMFS on any agency actions to be conducted in an area where the species is present and that may affect the species or its critical habitat. During the consultation, NMFS evaluates the agency action to determine whether the action may adversely affect listed species or critical habitat and issues its findings in a biological opinion. If NMFS concludes in the biological opinion that the agency action would likely result in the destruction or adverse modification of critical habitat, NMFS would also recommend any reasonable and prudent alternatives to the action. Reasonable and prudent alternatives are defined in 50 CFR 402.02 as alternative actions identified during formal consultation that can be implemented in a manner consistent with the intended purpose of the action, that are consistent with the scope of the Federal agency's legal authority and jurisdiction, that are economically and technologically feasible, and that would avoid the destruction or adverse modification of critical habitat.

Regulations at 50 CFR 402.16 require Federal agencies that have retained discretionary involvement or control over an action, or where such discretionary involvement or control is authorized by law, to reinitiate consultation on previously reviewed actions in instances where: (1) Critical habitat is subsequently designated; or (2) new information or changes to the action may result in effects to critical habitat not previously considered in the biological opinion. Consequently, some Federal agencies may request reinitiation of consultation or conference with NMFS on actions for which formal consultation has been completed, if those actions may affect designated critical habitat.

Activities subject to the ESA section 7 consultation process include activities on Federal lands and activities on private or State lands requiring a permit from a Federal agency (*e.g.,* a section 10(a)(1)(B) permit from NMFS) or some other Federal action, including funding (*e.g.,* Federal Highway Administration (FHA) or Federal Emergency Management Agency (FEMA) funding). ESA section 7 consultation would not be required for Federal actions that do not affect listed species or critical habitat and for actions on non-Federal and private lands that are not Federally funded, authorized, or carried out.

**Activities Likely To Be Affected**

ESA section 4(b)(8) requires in any final regulation to designate critical habitat an evaluation and brief description of those activities (whether public or private) that may adversely modify such habitat or that may be affected by such designation. A wide variety of activities may affect critical habitat for the Southern DPS and may be subject to the ESA section 7 consultation process when carried out, funded, or authorized by a Federal agency. These include water and land management actions of Federal agencies (*e.g.,* U.S. Forest Service (USFS), Bureau of Land Management (BLM), ACOE, USBR, Natural Resource Conservation Service (NRCS), National Park Service (NPS), Bureau of Indian Affairs (BIA), the FERC, and the Nuclear Regulatory Commission (NRC)) and related or similar Federally-regulated projects and activities on Federal lands, including hydropower sites and proposed alternative energy hydrokinetic projects licensed by the FERC; nuclear power sites licensed by the NRC; dams built or operated by the ACOE or USBR; timber sales and other vegetation management activities conducted by the USFS, BLM and BIA; irrigation diversions authorized by the USFS and BLM; and road building and maintenance activities authorized by the USFS, BLM, NPS, and BIA. Other actions of concern include dredge and fill, mining, diking, and bank stabilization activities authorized or conducted by the COE, habitat modifications authorized by the FEMA, and approval of water quality standards and pesticide labeling and use restrictions administered by the Environmental Protection Agency (EPA).

Private entities may also be affected by this final critical habitat designation if a Federal permit is required, Federal funding is received, or the entity is involved in or receives benefits from a Federal project. For example, private entities may have special use permits to convey water or build access roads across Federal land; they may require Federal permits to construct irrigation withdrawal facilities, or build or repair docks; they may obtain water from Federally funded and operated irrigation projects; or they may apply pesticides that are only available with Federal agency approval. These activities will need to be evaluated with respect to their potential to destroy or adversely modify critical habitat. Changes to the actions to minimize or avoid destruction or adverse modification of designated critical habitat may result in changes to some activities, such as the operations of dams and dredging activities. Transportation and utilities sectors may need to modify the placement of culverts, bridges, and utility conveyances (*e.g.,* water, sewer, and power lines) to avoid barriers to fish migration. Developments (*e.g.,* marinas, residential, or industrial facilities) occurring in or near streams, estuaries, or marine waters designated as critical habitat that require Federal authorization or funding may need to be altered or built in a manner to ensure that critical habitat is not destroyed or adversely modified as a result of the construction or subsequent operation of the facility.

Questions regarding whether specific activities will constitute destruction or adverse modification of critical habitat should be directed to NMFS (*see* **ADDRESSES** and **FOR FURTHER INFORMATION CONTACT**).

**Peer Review**

On July 1, 1994, a joint USFWS/NMFS policy for peer review was issued stating that the Services would solicit independent peer review to ensure the best biological and commercial data is used in the development of rulemaking actions and draft recovery plans under the ESA (59 FR 34270). On December 16, 2004, the Office of Management and Budget (OMB) issued its Final Information Quality Bulletin for Peer Review (Bulletin). The Bulletin was published in the **Federal Register** on January 14, 2005 (70 FR 2664), and went into effect on June 16, 2005. The primary purpose of the Bulletin is to improve the quality and credibility of scientific information disseminated by

the Federal government by requiring peer review of ''influential scientific information'' and highly influential scientific information'' prior to public dissemination. Influential scientific information is defined as ''information the agency reasonably can determine will have or does have a clear and substantial impact on important public policies or private sector decisions.'' The Bulletin provides agencies broad discretion in determining the appropriate process and level of peer review. Stricter standards were established for the peer review of ''highly influential scientific assessments'', defined as information whose ''dissemination could have a potential impact of more than $500 million in any one year on either the public or private sector or that the dissemination is novel, controversial, or precedent-setting, or has significant interagency interest.'' The draft biological report and draft economic analysis report supporting this final rule to designate critical habitat for the Southern DPS of green sturgeon are considered influential scientific information and subject to peer review. These two reports were each distributed to three independent peer reviewers for review. The final biological report and final economic analysis report incorporate the comments and additional information provided by the peer reviewers. The peer reviewer comments were compiled into a peer review report, which is available on the Southwest Region Web site at *http://swr.nmfs.noaa.gov,* on the Federal eRulemaking Web site at *http://www.regulations.gov,* or upon request (*see* **ADDRESSES**).

## Required Determinations

### *Regulatory Planning and Review (E.O. 12866)*

This final rule has been determined to be significant for purposes of E.O. 12866. A final economic analysis report and ESA section 4(b)(2) report have been prepared to support the exclusion process under section 4(b)(2) of the ESA and our consideration of alternatives to this rulemaking as required under E.O. 12866. The final economic analysis report and final ESA section 4(b)(2) report are available on the Southwest Region Web site at *http://swr.nmfs.noaa.gov,* on the Federal eRulemaking Web site at *http://www.regulations.gov,* or upon request (*see* **ADDRESSES**).

### *Regulatory Flexibility Act (5 U.S.C. 601 et seq.)*

Under the Regulatory Flexibility Act (RFA) (5 U.S.C. 601 *et seq.,* as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996), whenever an agency publishes a notice of rulemaking for any proposed or final rule, it must prepare and make available for public comment a regulatory flexibility analysis describing the effects of the rule on small entities (*i.e.,* small businesses, small organizations, and small government jurisdictions). We have prepared a final regulatory flexibility analysis (FRFA), which is part of the final economic analysis report. This document is available upon request (*see* **ADDRESSES**), via our Web site at *http://swr.nmfs.noaa.gov,* or via the Federal eRulemaking Web site at *http://www.regulations.gov.* The results of the FRFA are summarized below.

At the present time, little information exists regarding the cost structure and operational procedures and strategies in the sectors that may be directly affected by the potential critical habitat designation. In addition, given the short consultation history for green sturgeon, there is significant uncertainty regarding the activities that may trigger an ESA section 7 consultation or how those activities may be modified as a result of consultation. With these limitations in mind, we considered which of the potential economic impacts we analyzed might affect small entities. These estimates should not be considered exact estimates of the impacts of potential critical habitat to individual businesses.

The impacts to small businesses were assessed for the following eight activities: dredging, in-water construction or alterations, NPDES activities and other activities resulting in non-point pollution, agriculture, dam operations, water diversion operations, bottom trawl fisheries, and power plant operations. The impacts on small entities were not assessed for LNG projects, desalination plants, tidal and wave energy projects, and restoration projects because there is great uncertainty regarding impacts to these activities, the activities are unlikely to be conducted by small entities, or the impacts to small businesses are expected to be minor.

Small entities were defined by the Small Business Administration size standards for each activity type. The majority (>70 percent) of entities affected within each specific area would be considered a small entity. A total of 10,398 small businesses involved in the activities listed above would most likely be affected by the final critical habitat designation. The estimated economic impacts on small entities vary depending on the activity type and location. The largest total estimated annualized impacts borne by small entities were for bottom trawl fisheries and the operation of dams and water diversions.

In accordance with the requirements of the RFA (as amended by SBREFA, 1996) this analysis considered various alternatives to the critical habitat designation for the green sturgeon. The alternative of not designating critical habitat for the green sturgeon was considered and rejected because such an approach does not meet the legal requirements of the ESA and would not provide for the conservation of the Southern DPS. The alternative of designating all potential critical habitat areas (*i.e.,* no areas excluded) was also considered and rejected because NMFS has the discretionary authority to exclude areas under the ESA and, for several areas, the economic benefits of exclusion outweighed the benefits of inclusion. The total annualized impacts borne by small entities under this alternative were $60.1 million to $210 million (discounted at 7 percent) or $60 million to $210 million (discounted at 3 percent).

An alternative to designating critical habitat within all 41 units is the designation of critical habitat within a subset of these units. This approach would help to reduce the number of small entities potentially affected. Under section 4(b)(2) of the ESA, NMFS must consider the economic impacts, impacts to national security, and other relevant impacts of designating any particular area as critical habitat. NMFS has the discretion to exclude an area from designation as critical habitat if the benefits of exclusion (*i.e.,* the impacts that would be avoided if an area were excluded from the designation) outweigh the benefits of designation (*i.e.,* the conservation benefits to the Southern DPS if an area were designated), as long as exclusion of the area will not result in extinction of the species. Exclusion under section 4(b)(2) of the ESA of one or more of the 41 units considered for designation would reduce the potential effects on small entities. The extent to which the economic impact to small entities would be reduced depends on how many, and which, units would be excluded. The determination of which units and how many to exclude depends on NMFS' ESA 4(b)(2) analysis, which is conducted for each unit and described in detail in the final ESA

section 4(b)(2) analysis report (NMFS 2009c). The total estimated annualized impacts borne by small entities under this alternative were $17.9 million to $24.5 million (discounted at 7 percent) or $17.9 million to $24.4 million (discounted at 3 percent). It is estimated that the exclusions in this final rule will result in a reduction in total annualized impacts on small entities of between $42.2 million to $185.5 million (for estimates discounted at 7 percent) or between $42.1 million to $185.6 million (for estimates discounted at 3 percent). NMFS selected this alternative because it results in a critical habitat designation that provides for the conservation of the Southern DPS, reduces impacts on small entities, and meets the requirements under the ESA and our joint NMFS–USFWS regulations for designating critical habitat.

*E.O. 13211*

On May 18, 2001, the President issued an Executive Order on regulations that significantly affect energy supply, distribution, and use. E.O. 13211 requires agencies to prepare Statements of Energy Effects when undertaking an action expected to lead to the promulgation of a final rule or regulation that is a significant regulatory action under E.O. 12866 and is likely to have a significant adverse effect on the supply, distribution, or use of energy. An energy impacts analysis was prepared under E.O. 13211 and is available as part of the final economic analysis report. The results of the analysis are summarized here.

Activities associated with the supply, distribution, or use of energy that may be affected by this final critical habitat designation include the operation of hydropower dams, alternative energy hydrokinetic projects, and LNG projects. Energy impacts would result from requested project modifications under an ESA section 7 consultation. The most relevant impacts include potential changes in natural gas and electricity production and changes in the cost of energy production.

In the final economic analysis, the effects of the critical habitat designation on 189 dams located within the critical habitat areas are evaluated. Of these 189 dams, 11 dams have hydropower capacity. Potential project modifications may be required to address impacts of the hydropower dams on flow regimes. These project modifications may include changes in water flow through the turbines or seasonal changes to flow through turbines. These changes may result in reductions in electricity production and increases in energy costs. However, the changes required and their effects on energy production and costs would vary depending on the characteristics of the dam and the hydrology of the river system. Because the areas overlap with existing critical habitat designations for salmon species, and because the guidelines we have in place for dam modifications focus on listed salmonids, we will likely recommend modifications to dams that are similar to those we recommend for salmonids until additional information on green sturgeon indicates otherwise. Thus, the additional effects of the critical habitat designation for green sturgeon would likely be minimal. In addition, modifications required for the protection of critical habitat would likely be similar to those required under the jeopardy standard.

The final economic analysis evaluated the effects of the critical habitat designation on a number of proposed alternative energy hydrokinetic projects (*e.g.,* tidal and wave energy projects). Future management and required project modifications for green sturgeon critical habitat related to these projects are uncertain and could vary widely in scope from project to project. Because these proposed projects are still in the preliminary stages, the potential impact of possible green sturgeon conservation efforts on energy production and the associated cost of that energy for each project are unclear. In the most extreme case (*i.e.,* the critical habitat designation results in all projects not being constructed), the reductions in electricity production would be significant (an estimated 2,000 megawatts). However, we do not anticipate that conservation efforts to address green sturgeon critical habitat will result in all project construction from being halted. It is more likely that any additional cost of green sturgeon conservation efforts would be passed on to the consumer in the form of slightly higher energy prices. More information is needed, however, to more precisely estimate the potential energy impacts resulting from the application of conservation measures to alternative energy projects. It is important to note, however, that many other environmental concerns have been raised and must be addressed in the development and construction of alternative energy projects, including concerns for other marine fish species (McIsaac 2008, Letter from the Pacific Fishery Management Council to Randall Luthi, Minerals Management Service). It is likely that management measures to minimize or avoid habitat impacts for other species will be required for alternative energy projects. Based on the best available information, the project modifications we would require to protect green sturgeon critical habitat would likely be similar to those applied for the protection of other marine species.

The final economic analysis also analyzed the potential effects of the critical habitat designation on proposed LNG projects. Because no LNG projects currently exist in the critical habitat areas, the potential impact of LNG facilities on green sturgeon critical habitat and the potential project modifications that may be required to mitigate those impacts remain uncertain. There are several proposed LNG projects in the critical habitat areas, with a combined natural gas production capacity of 7,800 million cubic feet per day. In the most extreme case, green sturgeon critical habitat would require that these proposed LNG projects be relocated to areas outside of the critical habitat areas. However, it is more likely that other less costly project modifications will be necessary, such as changes to dredging operations associated with the project, restoration of riparian habitat, or other changes depending on the specifics of the project. These project modifications may result in higher natural gas costs for consumers. Additional information is needed to address uncertainties regarding the potential impacts of the critical habitat designation on LNG projects and on energy production and costs associated with those projects. In cases where listed salmon and steelhead species or critical habitat designated for these species occurs within the areas where proposed LNG projects are located (*e.g.,* in the Lower Columbia River), the best available information indicates that measures implemented for the protection of these species would be similar to those required to protect critical habitat for green sturgeon.

Based on this energy impacts analysis, we recognize that many uncertainties exist and more information is needed to adequately estimate the potential impacts of the critical habitat designation on energy production and costs. Using the best available information, we have determined that the designation of critical habitat for Southern DPS green sturgeon may result in impacts on the supply, distribution, or use of energy, but that these impacts would not be significant because many of the impacts would already exist due to protections for other listed species.

*Unfunded Mandates Reform Act (2 U.S.C. 1501 et seq.)*

In accordance with the Unfunded Mandates Reform Act, NMFS makes the following findings:

(A) This final rule will not produce a Federal mandate. In general, a Federal mandate is a provision in legislation, statute, or regulation that would impose an enforceable duty upon State, local, Tribal governments, or the private sector and includes both ''Federal intergovernmental mandates'' and ''Federal private sector mandates.'' These terms are defined in 2 U.S.C. 658(5)–(7). ''Federal intergovernmental mandate'' includes a regulation that ''would impose an enforceable duty upon State, local, or Tribal governments'' with two exceptions. It excludes ''a condition of Federal assistance.'' It also excludes ''a duty arising from participation in a voluntary Federal program,'' unless the regulation ''relates to a then-existing Federal program under which $500,000,000 or more is provided annually to State, local, and Tribal governments under entitlement authority,'' if the provision would ''increase the stringency of conditions of assistance'' or ''place caps upon, or otherwise decrease, the Federal government's responsibility to provide funding'' and the State, local, or Tribal governments ''lack authority'' to adjust accordingly. (At the time of enactment, these entitlement programs were: Medicaid; Aid to Families with Dependent Children work programs; Child Nutrition; Food Stamps; Social Services Block Grants; Vocational Rehabilitation State Grants; Foster Care, Adoption Assistance, and Independent Living; Family Support Welfare Services; and Child Support Enforcement.) ''Federal private sector mandate'' includes a regulation that ''would impose an enforceable duty upon the private sector, except (I) a condition of Federal assistance; or (ii) a duty arising from participation in a voluntary Federal program.'' The designation of critical habitat does not impose an enforceable duty on non-Federal government entities or private parties. The only regulatory effect of a critical habitat designation is that Federal agencies must ensure that their actions do not destroy or adversely modify critical habitat under ESA section 7. Non-Federal entities who receive funding, assistance, or permits from Federal agencies, or otherwise require approval or authorization from a Federal agency for an action may be indirectly affected by the designation of critical habitat. Furthermore, to the extent that non-Federal entities are indirectly impacted because they receive Federal assistance or participate in a voluntary Federal aid program, the Unfunded Mandates Reform Act would not apply; nor would critical habitat shift the costs of the large entitlement programs listed above to State governments.

(b) Due to the prohibition against take of the Southern DPS both within and outside of the designated areas, we do not anticipate that this final rule will significantly or uniquely affect small governments. As such, a Small Government Agency Plan is not required.

*Takings*

Under E.O. 12630, Federal agencies must consider the effects of their actions on constitutionally protected private property rights and avoid unnecessary takings of property. A taking of property includes actions that result in physical invasion or occupancy of private property, and regulations imposed on private property that substantially affect its value or use. In accordance with E.O. 12630, this final rule does not have significant takings implications. A takings implication assessment is not required. The designation of critical habitat affects only Federal agency actions. This final rule would not increase or decrease the current restrictions on private property concerning take of Southern DPS fish, nor do we expect the final critical habitat designation to impose substantial additional burdens on land use or substantially affect property values. Additionally, the final critical habitat designation does not preclude the development of Habitat Conservation Plans and issuance of incidental take permits for non-Federal actions. Owners of areas included within the proposed critical habitat designation would continue to have the opportunity to use their property in ways consistent with the survival of listed Southern DPS.

*Federalism*

In accordance with E.O. 13132, we determined that this final rule does not have significant Federalism effects and that a Federalism assessment is not required. In keeping with Department of Commerce policies, we request information from, and will coordinate development of this final critical habitat designation with, appropriate State resource agencies in California, Oregon, Washington, and Alaska. The final designation may have some benefit to State and local resource agencies in that the areas essential to the conservation of the species are more clearly defined, and the PCEs of the habitat necessary for the survival of the Southern DPS of green sturgeon are specifically identified. While this designation does not alter where and what Federally sponsored activities may occur, it may assist local governments in long-range planning (rather than waiting for case-by-case ESA section 7 consultations to occur).

*Civil Justice Reform*

In accordance with E.O. 12988, we have determined that this final rule does not unduly burden the judicial system and meets the requirements of sections 3(a) and 3(b)(2) of the E.O. We are designating critical habitat in accordance with the provisions of the ESA. This final rule uses standard property descriptions and identifies the PCEs within the designated areas to assist the public in understanding the habitat needs of the Southern DPS of green sturgeon.

*Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.)*

This final rule does not contain new or revised information collections that require approval by the Office of Management and Budget (OMB) under the Paperwork Reduction Act. This final rule will not impose recordkeeping or reporting requirements on State or local governments, individuals, businesses, or organizations. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

*National Environmental Policy Act of 1969 (NEPA)*

NMFS has determined that an environmental analysis as provided for under the NEPA of 1969 for critical habitat designations made pursuant to the ESA is not required. *See Douglas County* v. *Babbitt,* 48 F.3d 1495 (9th Cir. 1995), cert. denied, 116 S.Ct 698 (1996).

*Government-to-Government Relationship With Tribes*

The longstanding and distinctive relationship between the Federal and Tribal governments is defined by treaties, statutes, executive orders, judicial decisions, and agreements, which differentiate Tribal governments from the other entities that deal with, or are affected by, the Federal government. This relationship has given rise to a special Federal trust responsibility involving the legal responsibilities and obligations of the United States toward Indian Tribes and the application of fiduciary standards of due care with respect to Indian lands, Tribal trust

resources, and the exercise of Tribal rights. Pursuant to these authorities lands have been retained by Indian Tribes or have been set aside for Tribal use. These lands are managed by Indian Tribes in accordance with Tribal goals and objectives within the framework of applicable treaties and laws. E.O. 13175, Consultation and Coordination with Indian Tribal Governments, outlines the responsibilities of the Federal government in matters affecting Tribal interests.

There is a broad array of activities on Indian lands that may trigger ESA section 7 consultations. As described in the section above titled ''Exclusions Based on Impacts on Indian Lands,'' we have corresponded with potential affected Tribes and this final rule will exclude from the designation any Indian lands of the following Federally recognized Tribes (73 FR 18553, April 4, 2008) that overlap with the critical habitat designation for Southern DPS green sturgeon: the Hoh, Jamestown S'Klallam, Lower Elwha, Makah, Quileute, Quinault, and Shoalwater Bay Tribes in Washington; the Confederated Tribes of Coos, Lower Umpqua and Siuslaw Indians and the Coquille Tribe in Oregon; and the Cachil DeHe Band of Wintun Indians of the Colusa Indian Community, Cher-Ae Heights Trinidad Rancheria, Wiyot Tribe, and Yurok Tribe in California.

**References Cited**

A complete list of all references cited herein is available upon request (*see* **ADDRESSES** section) or via our Web site at *http://swr.nmfs.noaa.gov.*

**List of Subjects in 50 CFR Part 226**

Endangered and threatened species.

Dated: October 1, 2009.

**John Oliver,**

*Deputy Assistant Administrator for Operations, National Marine Fisheries Service.*

■ For the reasons set out in the preamble, this final rule amends part 226, title 50 of the Code of Federal Regulations as set forth below:

## PART 226—DESIGNATED CRITICAL HABITAT

■ 1. The authority citation of part 226 continues to read as follows:

**Authority:** 16 U.S.C. 1533.

■ 2. Add § 226.219, to read as follows:

### § 226.219 Critical habitat for the Southern Distinct Population Segment of North American Green Sturgeon (Acipenser medirostris).

Critical habitat is designated for the Southern Distinct Population Segment of North American green sturgeon (Southern DPS) as described in this section. The textual descriptions of critical habitat in this section are the definitive source for determining the critical habitat boundaries. The overview maps are provided for general guidance purposes only and not as a definitive source for determining critical habitat boundaries.

(a) *Critical habitat boundaries.* Critical habitat in freshwater riverine areas includes the stream channels and a lateral extent as defined by the ordinary high-water line (33 CFR 329.11). In areas for which the ordinary high-water line has not been defined pursuant to 33 CFR 329.11, the lateral extent will be defined by the bankfull elevation. Bankfull elevation is the level at which water begins to leave the channel and move into the floodplain and is reached at a discharge which generally has a recurrence interval of 1 to 2 years on the annual flood series. Critical habitat in bays and estuaries includes tidally influenced areas as defined by the elevation of mean higher high water. The boundary between coastal marine areas and bays and estuaries are delineated by the COLREGS lines (33 CFR 80). Critical habitat in coastal marine areas is defined by the zone between the 60 fathom (fm) depth bathymetry line and the line on shore reached by mean lower low water (MLLW), or to the COLREGS lines.

(1) *Coastal marine areas:* All U.S. coastal marine waters out to the 60 fm depth bathymetry line (relative to MLLW) from Monterey Bay, California (36°38′12″ N./121°56′13″ W.) north and east to include waters in the Strait of Juan de Fuca, Washington. The Strait of Juan de Fuca includes all U.S. marine waters: in Clallam County east of a line connecting Cape Flattery (48°23′10″ N./124°43′32″ W.), Tatoosh Island (48°23′30″ N./124°44′12″ W.), and Bonilla Point, British Columbia (48°35′30″ N./124°43′00″ W.); in Jefferson and Island counties north and west of a line connecting Point Wilson (48°08′38″ N./122°45′07″ W.) and Partridge Point (48°13′29″ N./122°46′11″ W.); and in San Juan and Skagit counties south of lines connecting the U.S.-Canada border (48°27′27″ N./123°09′46″ W.) and Pile Point (48°28′56″ N./123°05′33″ W.), Cattle Point (48°27′1″ N./122°57′39″ W.) and Davis Point (48°27′21″ N./122°56′03″ W.), and Fidalgo Head (48°29′34″ N./122°42′07″ W.) and Lopez Island (48°28′43″ N./122°49′08″ W.).

(2) *Freshwater riverine habitats:* Critical habitat is designated to include the following freshwater riverine areas in California:

(i) Sacramento River, California. From the Sacramento I-Street Bridge (40°9′10″ N./122°12′9″ W.) upstream to Keswick Dam (40°36′39″ N./122°26′46″ W.), including the waters encompassed by the Yolo Bypass and the Sutter Bypass areas and the lower American River from the confluence with the mainstem Sacramento River upstream to 38°35′47″ N./121°28′36″ W. (State Route 160 bridge over the American River).

(ii) Lower Feather River, California. From the confluence with the mainstem Sacramento River upstream to Fish Barrier Dam (39°31′13″ N./121°32′51″ W.).

(iii) Lower Yuba River, California. From the confluence with the mainstem Feather River upstream to Daguerre Dam (39°12′32″ N./121°35′53″ W.).

(3) *Sacramento-San Joaquin Delta, California:* Critical habitat is designated to include the Sacramento-San Joaquin Delta including all waterways up to the elevation of mean higher high water within the area defined in California Water Code Section 12220, except for the following excluded areas: Clifton Court and California Aqueduct Intake Channel (all reaches upstream from the Clifton Court Radial Gates at 37°49′47″ N./121°33′25″ W.); Delta-Mendota Canal (upstream from 37°48′58″ N./121°33′30″ W.); Fivemile Slough (all reaches upstream from its confluence with Fourteenmile Slough at 38°00′50″ N./121°22′09″ W.); Indian Slough and Werner Cuts (all reaches between the entrance to Discovery Bay at 37°55′8″ N./121°35′12″ W. and the junction of Werner Cut and Rock Slough at 37°58′14″ N./121°35′41″ W.); Italian Slough (all reaches upstream from 37°51′39″ N./121°34′53″ W.); Rock Slough (all reaches upstream from the junction with the Old River at 37°58′22″ N./121°34′40″ W.); Sand Mound Slough (all reaches upstream from 37°58′37″ N./121°37′19″ W.); Sacramento Deep Water Ship Channel (upstream from the confluence with Cache Slough at 38°14′13″ N./121°40′23″ W.); Sevenmile Slough (all reaches between Threemile Slough at 38°06′55″ N./121°40′55″ W. and Jackson Slough at 38°06′59″ N./121°37′44″ W.); Snodgrass Slough (all reaches upstream from Lambert Road at 38°18′33″ N./121°30′46″ W.); Tom Paine Slough (all reaches upstream from its confluence with Middle River at 37°47′25″ N./121°25′08″ W.); Trapper Slough (all reaches upstream from 37°53′36″ N./121°29′15″ W.); Unnamed oxbow loop (upstream from the confluence with the San Joaquin River at 37°43′9″ N./121°16′36″ W.); Unnamed oxbow loop (upstream from the

confluence with the San Joaquin River at 37°46′9″ N./121°18′6″ W.).

(4) *Coastal bays and estuaries:* Critical habitat is designated to include the following coastal bays and estuaries in California, Oregon, and Washington:

(i) *San Francisco Bay, San Pablo Bay, and Suisun Bay in California.* All tidally influenced areas of San Francisco Bay, San Pablo Bay, and Suisun Bay up to the elevation of mean higher high water, including, but not limited to, areas upstream to the head of tide endpoint in: Adobe Creek (38°12′42″ N./122°36′6″ W.); Alameda Creek (37°36′47″ N./122°4′18″ W.); Arroyo Corte Madera del Presidio (37°53′43″ N./122°31′48″ W.); Black John Slough (38°8′12″ N./122°33′42″ W.); Black John Slough (38°7′59″ N./122°32′54″ W.); Carneros Creek (38°13′52″ N./122°18′49″ W.); Colma Creek (37°39′6″ N./122°25′9″ W.); Coyote Creek (37°52′45″ N./122°31′31″ W.); Coyote Creek (37°27′17″ N./121°55′36″ W.); Coyote Creek, unnamed waterway (37°27′56″ N./121°55′40″ W.); Coyote Creek, unnamed waterway (37°26′23″ N./121°57′29″ W.); Coyote Creek, unnamed waterway (37°27′15″ N./121°56′12″ W.); Coyote Hills Slough (37°34′26″ N./122°3′36″ W.); Deverton Creek (38°13′38″ N./121°53′47″ W.); Gallinas Creek (38°0′50″ N./122°32′24″ W.); Gallinas Creek, South Fork (38°0′4″ N./122°32′9″ W.); Green Valley Creek (38°12′49″ N./122°7′51″ W.); Hastings Slough (38°1′30″ N./122°3′35″ W.); Huichica Creek, unnamed tributary (38°12′36″ N./122°21′35″ W.); Mt Eden Creek (37°37′6″ N./122°7′23″ W.); Mud Slough, unnamed waterway (37°29′48″ N./121°57′14″ W.); Mud Slough, unnamed waterway (37°28′43″ N./121°57′3″ W.); Newark Slough (37°31′36″ N./122°3′24″ W.); Newark Slough, unnamed waterway (37°31′51″ N./122°4′7″ W.); Novato Creek (38°5′50″ N./122°33′52″ W.); Petaluma River (38°14′53″ N./122°38′17″ W.); Petaluma River, unnamed tributary (38°12′58″ N./122°34′23″ W.); Railroad Slough (38°13′30″ N./122°26′28″ W.); Richardson Bay, unnamed tributary (37°54′2″ N./122°31′36″ W.); San Antonio Creek, unnamed tributary (38°9′45″ N./122°34′1″ W.); San Clemente Creek (37°55′12″ N./122°30′25″ W.); San Francisco Bay shoreline (37°40′44″ N./122°10′18″ W.); San Francisquito Creek (37°27′10″ N./122°7′40″ W.); San Pablo Bay shoreline (38°2′44″ N./122°15′44″ W.); San Pablo Creek (37°58′6″ N./122°22′42″ W.); San Rafael Creek (37°58′5″ N./122°31′35″ W.); Seal Slough (37°34′9″ N./122°17′30″ W.); Suisun Marsh (38°2′28″ N./121°57′55″ W.); Suisun Marsh (38°2′50″ N./121°58′39″ W.); Suisun Marsh (38°2′42″ N./121°56′16″ W.); Suisun Marsh (38°2′30″ N./121°55′18″ W.); Suisun Marsh, Grizzly Bay shoreline (38°5′53″ N./122°0′35″ W.); Suisun Marsh, Grizzly Bay shoreline (38°6′49″ N./121°58′54″ W.); Suisun Marsh, Grizzly Bay shoreline (38°8′19″ N./121°59′31″ W.); Suisun Marsh, Grizzly Bay shoreline (38°8′6″ N./121°59′33″ W.); Tolay Creek (38°9′42″ N./122°26′49″ W.); Tolay Creek (38°9′6″ N./122°26′49″ W.); Walnut Creek (38°0′16″ N./122°3′41″ W.); Wildcat Creek (37°57′26″ N./122°22′45″ W.).

(ii) *Humboldt Bay, California.* All tidally influenced areas of Humboldt Bay up to the elevation of mean higher high water, including, but not limited to, areas upstream to the head of tide endpoint in: Elk River (40°43′45″ N./124°11′15″ W.); Elk River (40°45′9″ N./124°10′57″ W.); Elk River (40°45′7″ N./124°10′58″ W.); Eureka Slough (40°48′14″ N./124°7′15″ W.); Eureka Slough (40°48′18″ N./124°8′29″ W.); Eureka Slough (40°48′14″ N./124°8′22″ W.); Eureka Slough (40°48′9″ N./124°8′14″ W.); Freshwater Creek (40°46′43″ N./124°4′48″ W.); Freshwater Slough (40°47′18″ N./124°6′54″ W.); Freshwater Slough (40°47′10″ N./124°6′15″ W.); Freshwater Slough (40°48′3″ N./124°6′53″ W.); Gannon Slough (40°50′48″ N./124°4′54″ W.); Gannon Slough (40°50′37″ N./124°4′53″ W.); Jacoby Creek (40°50′22″ N./124°4′16″ W.); Jacoby Creek (40°50′25″ N./124°4′56″ W.); Liscom Slough (40°52′35″ N./124°8′14″ W.); Mad River Slough (40°53′14″ N./124°8′9″ W.); Mad River Slough (40°53′59″ N./124°8′1″ W.); Mad River Slough (40°54′1″ N./124°8′9″ W.); McDaniel Slough (40°51′54″ N./124°8′52″ W.); McDaniel Slough (40°51′39″ N./124°6′2″ W.); Rocky Gulch/Washington Gulch (40°49′52″ N./124°4′58″ W.); Salmon Creek (40°41′12″ N./124°13′10″ W.); Unnamed tributary (40°42′36″ N./124°15′45″ W.); White Slough (40°41′56″ N./124°12′18″ W.).

(iii) *Coos Bay, Oregon.* All tidally influenced areas of Coos Bay up to the elevation of mean higher high water, including, but not limited to, areas upstream to the head of tide endpoint in: Boone Creek (43°16′31″ N./124°9′26″ W.); Catching Creek (43°16′31″ N./124°9′11″ W.); Coalbank Slough (43°21′10″ N./124°13′17″ W.); Coos River, South Fork (43°22′32″ N./123°59′34″ W.); Cox Canyon Creek (43°16′13″ N./124°18′52″ W.); Daniels Creek (43°21′10″ N./124°5′29″ W.); Davis Creek (43°17′29″ N./124°14′30″ W.); Day Creek (43°18′59″ N./124°18′24″ W.); Delmar Creek (43°15′24″ N./124°13′52″ W.); Deton Creek (43°24′15″ N./124°3′53″ W.); Elliot Creek (43°17′45″ N./124°17′45″ W.); Goat Creek (43°15′42″ N./124°12′58″ W.); Haynes Inlet (43°27′56″ N./124°11′22″ W.); Hayward Creek (43°19′7″ N./124°19′59″ W.); Joe Ney Slough (43°20′12″ N./124°17′39″ W.); John B Creek (43°16′59″ N./124°18′27″ W.); Kentuck Slough (43°25′19″ N./124°11′19″ W.); Larson Slough (43°27′43″ N./124°11′38″ W.); Lillian Creek (43°21′41″ N./124°8′41″ W.); Mart Davis Creek (43°22′58″ N./124°5′38″ W.); Matson Creek (43°18′27″ N./124°8′16″ W.); Millicoma River, East Fork (43°25′50″ N./124°1′2″ W.); Millicoma River, West Fork (43°25′48″ N./124°2′50″ W.); Noble Creek (43°15′16″ N./124°12′54″ W.); North Slough (43°29′26″ N./124°13′14″ W.); Pony Creek (43°24′6″ N./124°13′55″ W.); Seelander Creek (43°17′15″ N./124°8′41″ W.); Shinglehouse Slough (43°19′4″ N./124°13′14″ W.); Stock Slough (43°19′58″ N./124°8′22″ W.); Talbot Creek (43°17′1″ N./124°17′49″ W.); Theodore Johnson Creek (43°16′16″ N./124°19′22″ W.); Unnamed Creek (43°17′24″ N./124°17′56″ W.); Unnamed Creek (43°18′27″ N./124°7′55″ W.); Unnamed Creek (43°21′12″ N./124°9′17″ W.); Vogel Creek (43°22′10″ N./124°8′49″ W.); Wasson Creek (43°16′3″ N./124°19′23″ W.); Willanch Slough (43°24′5″ N./124°11′27″ W.); Wilson Creek (43°16′51″ N./124°9′2″ W.); Winchester Creek (43°15′49″ N./124°19′10″ W.).

(iv) *Winchester Bay, Oregon.* All tidally influenced areas of Winchester Bay up to the elevation of mean higher high water, including, but not limited to, areas upstream to the head of tide endpoint in: Brainard Creek (43°44′46″ N./124°1′39″ W.); Butler Creek (43°42′50″ N./124°3′0″ W.); Eslick Creek (43°47′46″ N./123°58′40″ W.); Frantz Creek (43°44′50″ N./124°5′25″ W.); Hudson Slough (43°44′56″ N./124°4′43″ W.); Joyce Creek (43°45′32″ N./124°1′49″ W.); Noel Creek (43°46′21″ N./124°0′6″ W.); Oar Creek (43°40′26″ N./124°3′41″ W.); Otter Creek (43°43′28″ N./124°0′4″ W.); Providence Creek (43°43′13″ N./124°7′44″ W.); Scholfield Creek (43°40′36″ N./124°5′38″ W.); Silver Creek (43°40′37″ N./124°9′21″ W.); Smith River (43°47′48″ N./123°53′3″ W.); Smith River, North Fork (43°48′17″ N./123°55′59″ W.); Umpqua River (43°40′3″ N./123°48′32″ W.); Unnamed Creek (43°40′6″ N./124°10′44″ W.); Unnamed Creek (43°40′14″ N./124°9′26″ W.); Winchester Creek (43°40′20″ N./124°8′49″ W.).

(v) *Yaquina Bay, Oregon.* All tidally influenced areas of Yaquina Bay up to the elevation of mean higher high water, including, but not limited to, areas upstream to the head of tide endpoint in: Babcock Creek (44°35′33″ N./123°55′42″ W.); Big Elk Creek (44°35′23″ N./123°50′43″ W.); Boone Slough

(44°35′5″ N./123°57′50″ W.); Depot Creek (44°38′30″ N./123°56′54″ W.); Flesher Slough (44°34′0″ N./123°58′53″ W.); Johnson Slough (44°34′60″ N./123°59′10″ W.); King Slough (44°35′35″ N./124°1′55″ W.); McCaffery Slough (44°33′56″ N./124°1′10″ W.); Mill Creek (44°35′7″ N./123°53′57″ W.); Montgomery Creek (44°35′8″ N./123°56′18″ W.); Nute Slough (44°35′19″ N./123°57′30″ W.); Olalla Creek (44°36′48″ N./123°55′30″ W.); Parker Slough (44°35′21″ N./124°0′50″ W.); Poole Slough (44°33′27″ N./123°58′46″ W.); Yaquina River (44°39′4″ N./123°51′26″ W.).

(vi) *Nehalem Bay, Oregon.* All tidally influenced areas of Yaquina Bay up to the elevation of mean higher high water, including, but not limited to, areas upstream to the head of tide endpoint in: Alder Creek (45°42′52″ N./123°54′12″ W.); Anderson Creek (45°44′25″ N./123°52′26″ W.); Coal Creek (45°44′49″ N./123°51′57″ W.); Foley Creek (45°41′48″ N./123°50′53″ W.); Gallagher Slough (45°42′4″ N./123°52′50″ W.); Messhouse Creek (45°40′0″ N./123°55′32″ W.); Nehalem River (45°41′48″ N./123°49′31″ W.); Nehalem River, North Fork (45°47′11″ N./123°49′19″ W.); Unnamed Creek (45°44′35″ N./123°51′53″ W.); Unnamed Creek (45°44′53″ N./123°51′12″ W.); Unnamed Creek (45°45′6″ N./123°50′56″ W.); Unnamed Creek (45°44′11″ N./123°51′40″ W.); Unnamed Creek (45°44′7″ N./123°51′40″ W.); Unnamed Creek (45°43′44″ N./123°52′35″ W.).

(vii) *Lower Columbia River estuary, Washington and Oregon.* All tidally influenced areas of the lower Columbia River estuary from the mouth upstream to river kilometer 74, up to the elevation of mean higher high water, including, but not limited to, areas upstream to the head of tide endpoint in: Bear Creek (46°10′0″ N./123°40′6″ W.); Big Creek (46°10′33″ N./123°35′30″ W.); Blind Slough/Gnat Creek (46°10′47″ N./123°31′45″ W.); Chinook River (46°18′14″ N./123°58′1″ W.); Deep Creek (46°19′3″ N./123°42′23″ W.); Driscol Slough (46°8′35″ N./123°23′44″ W.); Ferris Creek (46°10′5″ N./123°39′8″ W.); Grays River (46°21′34″ N./123°35′5″ W.); Hunt Creek (46°11′46″ N./123°26′30″ W.); Jim Crow Creek (46°16′19″ N./123°33′26″ W.); John Day River (46°9′13″ N./123°43′16″ W.); John Day River (46°9′10″ N./123°43′27″ W.); Klaskanine River (46°5′33″ N./123°44′52″ W.); Lewis and Clark River (46°5′52″ N./123°51′4″ W.); Marys Creek (46°10′12″ N./123°40′17″ W.); Seal Slough (46°19′20″ N./123°40′15″ W.); Sisson Creek (46°18′25″ N./123°43′46″ W.); Skamokawa Creek (46°19′11″ N./123°27′20″ W.); Skipanon River (46°9′31″ N./123°55′34″ W.); Wallacut River (46°19′28″ N./123°59′11″ W.); Wallooskee River (46°7′7″ N./123°46′25″ W.); Westport Slough/Clatskanie River (46°8′4″ N./123°13′31″ W.); Youngs River (46°4′11″ N./123°47′9″ W.).

(viii) *Willapa Bay, Washington.* All tidally influenced areas of Willapa Bay up to the elevation of mean higher high water, including, but not limited to, areas upstream to the head of tide endpoint in: Bear River (46°20′5″ N./123°56′8″ W.); Bone River (46°39′29″ N./123°54′2″ W.); Cedar River (46°45′37″ N./124°0′3″ W.); Naselle River (46°22′32″ N./123°49′19″ W.); Middle Nemah River (46°28′42″ N./123°51′13″ W.); North Nemah River (46°30′56″ N./123°52′27″ W.); South Nemah River (46°28′37″ N./123°53′15″ W.); Niawiakum River (46°36′39″ N./123°53′34″ W.); North River (46°48′51″ N./123°50′54″ W.); Palix River, Middle Fork (46°35′46″ N./123°52′29″ W.); Palix River, North Fork (46°36′10″ N./123°52′26″ W.); Palix River, South Fork (46°34′30″ N./123°53′42″ W.); Stuart Slough (46°41′9″ N./123°52′16″ W.); Willapa River (46°38′50″ N./123°38′50″ W.).

(ix) *Grays Harbor, Washington.* All tidally influenced areas of Grays Harbor up to the elevation of mean higher high water, including, but not limited to, areas upstream to the head of tide endpoint in: Andrews Creek (46°49′23″ N./124°1′23″ W.); Beaver Creek (46°54′20″ N./123°58′53″ W.); Campbell Creek (46°56′9″ N./123°53′12″ W.); Campbell Slough (47°2′45″ N./124°3′40″ W.); Chapin Creek (46°56′18″ N./123°52′30″ W.); Charley Creek (46°56′55″ N./123°49′53″ W.); Chehalis River (46°58′16″ N./123°35′38″ W.); Chenois Creek (47°2′36″ N./124°0′54″ W.); Elk River (46°50′8″ N./123°59′8″ W.); Gillis Slough (47°2′34″ N./124°2′29″ W.); Grass Creek (47°1′41″ N./124°0′40″ W.); Hoquiam River (47°3′3″ N./123°55′34″ W.); Hoquiam River, East Fork (47°3′7″ N./123°51′25″ W.); Humptulips River (47°5′42″ N./124°3′34″ W.); Indian Creek (46°55′55″ N./123°53′47″ W.); Jessie Slough (47°3′23″ N./124°3′0″ W.); Johns River (46°52′28″ N./123°57′2″ W.); Newskah Creek (46°56′26″ N./123°50′58″ W.); O'Leary Creek (46°54′51″ N./123°57′24″ W.); Stafford Creek (46°55′51″ N./123°54′28″ W.); Wishkah River (47°2′39″ N./123°47′20″ W.); Wynoochee River (46°58′19″ N./123°36′57″ W.).

(b) *Primary constituent elements.* The primary constituent elements essential for the conservation of the Southern DPS of green sturgeon are:

(1) *For freshwater riverine systems:*

(i) *Food resources.* Abundant prey items for larval, juvenile, subadult, and adult life stages.

(ii) *Substrate type or size (i.e., structural features of substrates).* Substrates suitable for egg deposition and development (*e.g.*, bedrock sills and shelves, cobble and gravel, or hard clean sand, with interstices or irregular surfaces to ''collect'' eggs and provide protection from predators, and free of excessive silt and debris that could smother eggs during incubation), larval development (*e.g.*, substrates with interstices or voids providing refuge from predators and from high flow conditions), and subadults and adults (*e.g.*, substrates for holding and spawning).

(iii) *Water flow.* A flow regime (*i.e.*, the magnitude, frequency, duration, seasonality, and rate-of-change of fresh water discharge over time) necessary for normal behavior, growth, and survival of all life stages.

(iv) *Water quality.* Water quality, including temperature, salinity, oxygen content, and other chemical characteristics, necessary for normal behavior, growth, and viability of all life stages.

(v) *Migratory corridor.* A migratory pathway necessary for the safe and timely passage of Southern DPS fish within riverine habitats and between riverine and estuarine habitats (*e.g.,* an unobstructed river or dammed river that still allows for safe and timely passage).

(vi) *Depth.* Deep (≥5 m) holding pools for both upstream and downstream holding of adult or subadult fish, with adequate water quality and flow to maintain the physiological needs of the holding adult or subadult fish.

(vii) *Sediment quality.* Sediment quality (*i.e.*, chemical characteristics) necessary for normal behavior, growth, and viability of all life stages.

(2) *For estuarine habitats:*

(i) *Food resources.* Abundant prey items within estuarine habitats and substrates for juvenile, subadult, and adult life stages.

(ii) *Water flow.* Within bays and estuaries adjacent to the Sacramento River (*i.e.*, the Sacramento-San Joaquin Delta and the Suisun, San Pablo, and San Francisco bays), sufficient flow into the bay and estuary to allow adults to successfully orient to the incoming flow and migrate upstream to spawning grounds.

(iii) *Water quality.* Water quality, including temperature, salinity, oxygen content, and other chemical characteristics, necessary for normal behavior, growth, and viability of all life stages.

(iv) *Migratory corridor.* A migratory pathway necessary for the safe and timely passage of Southern DPS fish within estuarine habitats and between estuarine and riverine or marine habitats.

(v) *Depth.* A diversity of depths necessary for shelter, foraging, and migration of juvenile, subadult, and adult life stages.

(vi) *Sediment quality.* Sediment quality (*i.e.,* chemical characteristics) necessary for normal behavior, growth, and viability of all life stages.

(3) *For nearshore coastal marine areas:*

(i) *Migratory corridor.* A migratory pathway necessary for the safe and timely passage of Southern DPS fish within marine and between estuarine and marine habitats.

(ii) *Water quality.* Nearshore marine waters with adequate dissolved oxygen levels and acceptably low levels of contaminants (*e.g.,* pesticides, organochlorines, elevated levels of heavy metals) that may disrupt the normal behavior, growth, and viability of subadult and adult green sturgeon.

(iii) *Food resources.* Abundant prey items for subadults and adults, which may include benthic invertebrates and fishes.

(c) *Sites owned or controlled by the Department of Defense.* Critical habitat does not include the following areas owned or controlled by the Department of Defense, or designated for its use, in the States of California, Oregon, and Washington:

(1) Mare Island U.S. Army Reserve Center, San Pablo Bay, CA;

(2) Strait of Juan de Fuca naval air-to-surface weapon range, restricted area, WA;

(3) Strait of Juan de Fuca and Whidbey Island naval restricted area, WA;

(4) Admiralty Inlet naval restricted area, Strait of Juan de Fuca, WA; and

(5) Navy 3 operating area, Strait of Juan de Fuca, WA.

(d) *Indian lands.* Critical habitat does not include any Indian lands of the following Federally-recognized Tribes in the States of California, Oregon, and Washington:

(1) Cachil DeHe Band of Wintun Indians of the Colusa Indian Community, California;

(2) Cher-Ae Heights Trinidad Rancheria, California;

(3) Confederated Tribes of the Coos, Lower Umpqua, and Siuslaw, Oregon;

(4) Coquille Indian Tribe, Oregon;

(5) Hoh Tribe, Washington;

(6) Jamestown S'Klallam Tribe, Washington;

(7) Lower Elwha Tribe, Washington;

(8) Makah Tribe, Washington;

(9) Quileute Tribe, Washington;

(10) Quinault Tribe, Washington;

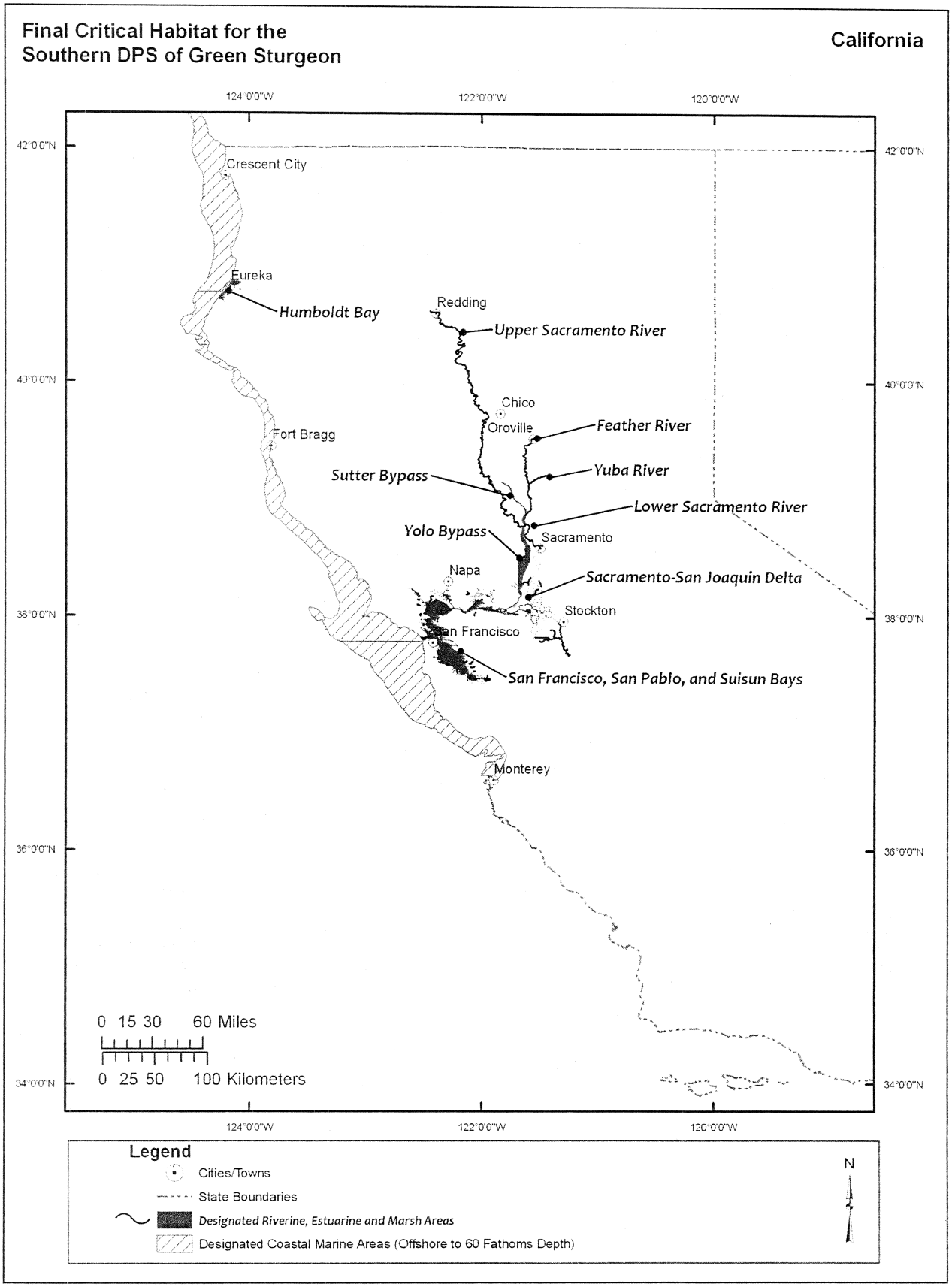
(11) Shoalwater Bay Tribe, Washington;

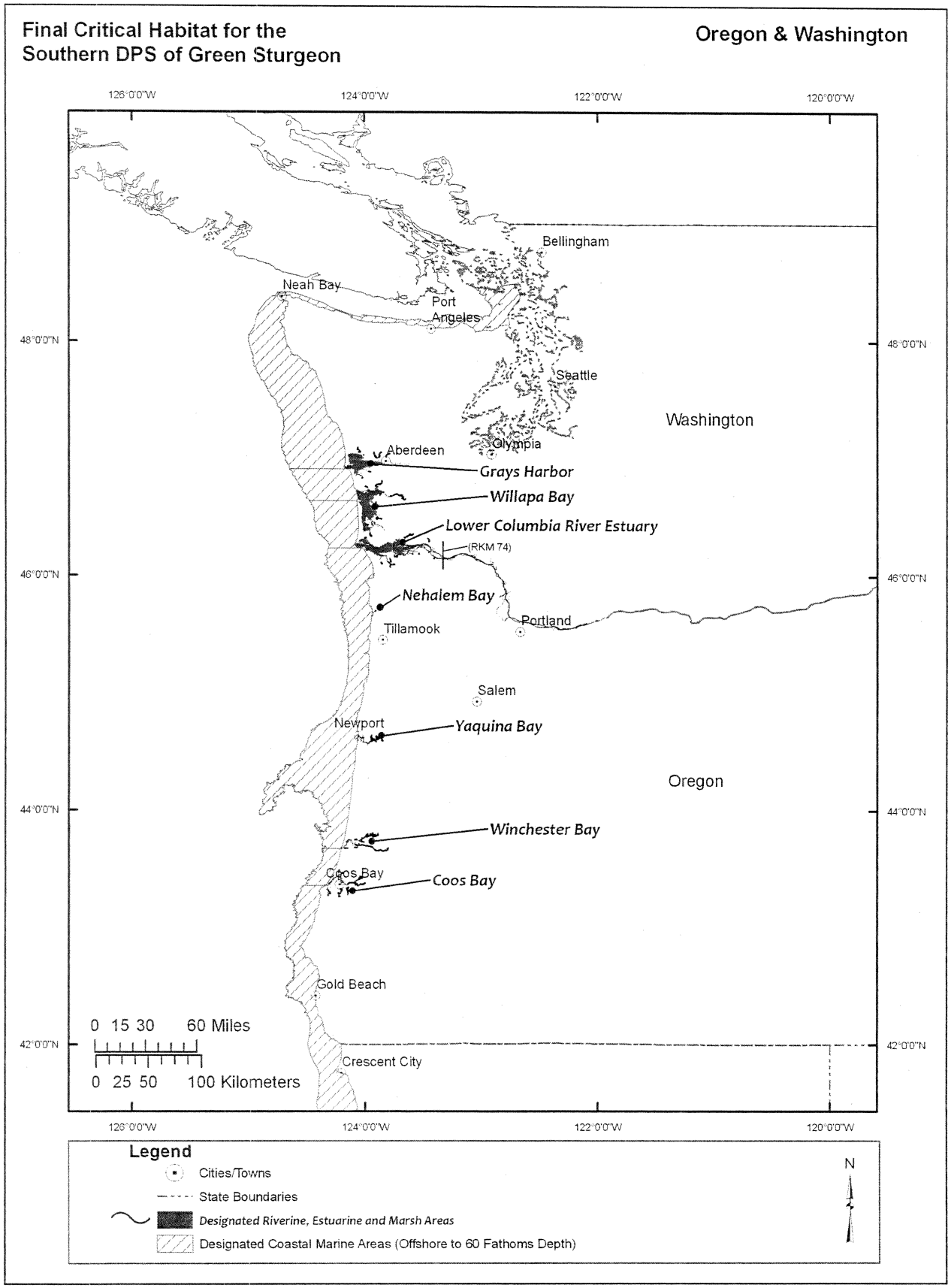
(12) Wiyot Tribe, California; and

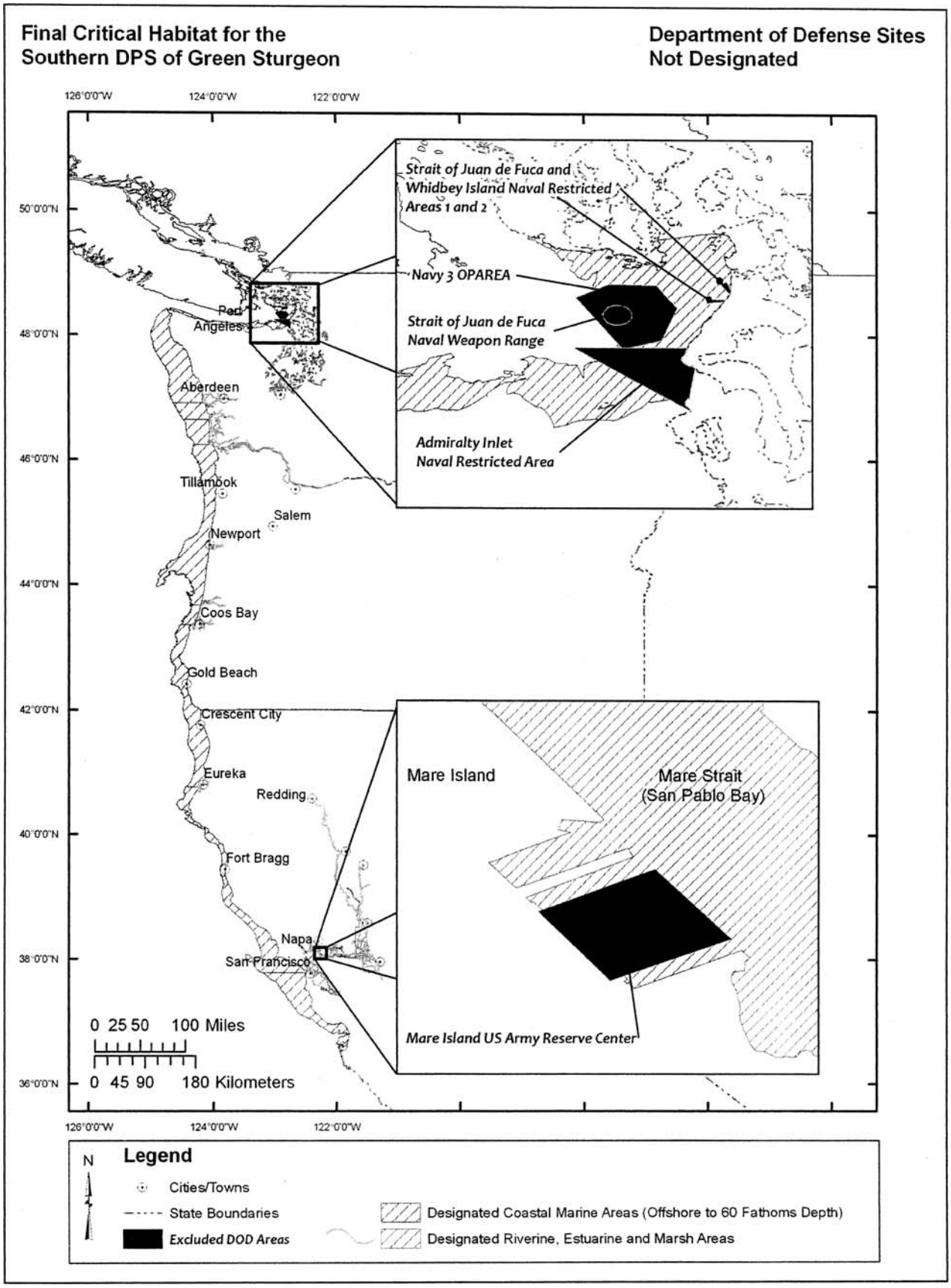
(13) Yurok Tribe, California.

(e) Overview maps of final critical habitat for the Southern DPS of green sturgeon follow:

**BILLING CODE 3510–22–P**


Final Critical Habitat for the
Southern DPS of Green Sturgeon
California
124°0'0"W
122°0'0"W
120°0'0"W
42°0'0"N
40°0'0"N
38°0'0"N
36°0'0"N
34°0'0"N
Crescent City
Eureka
Humboldt Bay
Redding
Upper Sacramento River
Chico
Oroville
Feather River
Fort Bragg
Yuba River
Sutter Bypass
Lower Sacramento River
Yolo Bypass
Sacramento
Napa
Sacramento-San Joaquin Delta
Stockton
San Francisco
San Francisco, San Pablo, and Suisun Bays
Monterey
0 15 30 60 Miles
0 25 50 100 Kilometers
Legend
Cities/Towns
State Boundaries
Designated Riverine, Estuarine and Marsh Areas
Designated Coastal Marine Areas (Offshore to 60 Fathoms Depth)
N


Final Critical Habitat for the
Southern DPS of Green Sturgeon
Oregon & Washington
126°0'0"W
124°0'0"W
122°0'0"W
120°0'0"W
48°0'0"N
46°0'0"N
44°0'0"N
42°0'0"N
Bellingham
Neah Bay
Port Angeles
Seattle
Washington
Aberdeen
Olympia
Grays Harbor
Willapa Bay
Lower Columbia River Estuary
(RKM 74)
Nehalem Bay
Portland
Tillamook
Salem
Newport
Yaquina Bay
Oregon
Winchester Bay
Coos Bay
Coos Bay
Gold Beach
Crescent City
0 15 30 60 Miles
0 25 50 100 Kilometers
Legend
Cities/Towns
State Boundaries
Designated Riverine, Estuarine and Marsh Areas
Designated Coastal Marine Areas (Offshore to 60 Fathoms Depth)
N

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