

Designation of Critical Habitat for  
the Southern Distinct Population Segment of  
Green Sturgeon

*Section 4(b)(2) Report*

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**NATIONAL MARINE FISHERIES SERVICE**  
*Southwest Region*

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This report contains NOAA Fisheries, Southwest Region’s recommendations for designating critical habitat under section 4 of the Endangered Species Act (ESA) for the Southern Distinct Population Segment of green sturgeon (hereafter Southern DPS), which we listed under the ESA on April 7, 2006 (71 FR 17757). It describes the methods used, process followed, and conclusions reached for each step leading to the proposed critical habitat designation.

## I. Statute and Regulations

We developed our recommendations consistent with statutory requirements and agency regulations, which are summarized below.

### ***Findings and purposes of the Act emphasize habitat conservation***

In section 1 of the ESA, “Findings,” (16 U.S.C. 1531(a)(1)) Congress declared that:

Various species of fish, wildlife and plants in the United States have been rendered extinct as a consequence of economic growth and development untempered by adequate concern and conservation.

Section 2 of the ESA sets forth the purposes of the Act, beginning with habitat protection:

The purposes of this chapter are to provide a means whereby *the ecosystems upon which endangered species and threatened species depend may be conserved*, to provide a program for the conservation of such endangered species and threatened species, and to take such steps as may be appropriate to achieve the purposes of the treaties and conventions set forth in subsection (a) of this section. (emphasis added)

### ***“Critical Habitat” is specifically defined***

Section 3(5)(A) of the ESA (16 U.S.C. 1532 (5)) defines critical habitat in some detail.

(5)(A) The term “critical habitat” for a threatened or endangered species means –

(i) the specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the provisions of section 1533 of this title, 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 in accordance with the provisions of section 1533 of this title, upon a determination by the Secretary that such areas are essential for the conservation of the species.

(B) Critical habitat may be established for those species now listed as threatened or endangered species for which no critical habitat has heretofore been established as set forth in subparagraph (A) of this paragraph.

(C) Except in those circumstances determined by the Secretary, critical habitat shall not include the entire geographical area which can be occupied by the threatened or endangered species.

### ***“Conservation” is specifically defined***

Section 3(3) of the Act defines conservation (16 U.S.C. 1532(3)):

(3) The terms "conserve", "conserving", and "conservation" mean to use and 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 chapter are no longer necessary.

### ***Certain military lands are precluded from designation***

In 2003 Congress amended section 4(b)(1) of the ESA to limit the designation of land controlled by the Department of Defense (National Defense Authorization Act, P.L. No. 108-136):

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.

### ***Specific information required for making designations***

Section 4(a)(3) requires NOAA Fisheries to make critical habitat designations concurrently with the listing determination, to the maximum extent prudent and determinable:

(3) The Secretary, by regulation promulgated in accordance with subsection (b) of this section and to the maximum extent prudent and determinable -

(A) shall, concurrently with making a determination under paragraph (1) that a species is an endangered species or a threatened species, designate any habitat of such species which is then considered to be critical habitat.

### ***Impacts of designation must be considered and areas may be excluded***

Specific areas that fall within the definition of critical habitat are not automatically designated as critical habitat. Section 4(b)(2) (16 U.S.C. 1533(b)(1)(A)) requires the Secretary to first consider the impact of designation and permits the Secretary to exclude areas from designation under certain circumstances. Exclusion is not required for any areas.

The Secretary shall designate critical habitat, and make revisions thereto, under subsection (a)(3) of this section on the basis of the best scientific data available and after taking into consideration the economic impact, the impact to national security and any

other relevant impact, of specifying any particular area as critical habitat. The Secretary may exclude any area from critical habitat if he determines that the benefits of such exclusion outweigh the benefits of specifying such area as part of the critical habitat, unless he determines, based on the best scientific and commercial data available, that the failure to designate such area as critical habitat will result in the extinction of the species concerned.

### ***Federal agencies must ensure their actions are not likely to destroy or adversely modify critical habitat***

Once critical habitat is designated, section 7(a)(2) provides that federal agencies must ensure any actions they authorize, fund or carry out are not likely to result in the destruction or adverse modification of designated critical habitat (16 U.S.C. 1536(a)(2)). Section 7 also requires federal agencies to ensure such actions do not jeopardize the continued existence of the listed species:

Each Federal agency shall, in consultation with and with the assistance of the Secretary, insure that any action authorized, funded, or carried out by such agency (hereinafter in this section referred to as an "agency action") is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined by the Secretary, after consultation as appropriate with affected States, to be critical, unless such agency has been granted an exemption for such action by the Committee pursuant to subsection (h) of this section. In fulfilling the requirements of this paragraph each agency shall use the best scientific and commercial data available.

### ***Authority to designate critical habitat is delegated to NOAA Fisheries***

The authority to designate critical habitat, including the authority to consider the impacts of designation, the authority to weigh those impacts against the benefit of designation, and the authority to exclude particular areas, has been delegated to the Assistant Administrator of the National Marine Fisheries Service (Department Organization Order 10-15 (5/24/04). NOAA Organization Handbook, Transmittal #34, May 31, 1993).

### ***Joint regulations govern designation***

Joint regulations of the Services elaborate on those physical and biological features essential to conservation, and set criteria for the delineation of critical habitat.

50 CFR Sec. 424.12 Criteria for designating critical habitat.

(b) In determining what areas are critical habitat, the Secretary 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. Such requirements include, but are not limited to, the following:

- (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.

When considering the designation of critical habitat, the Secretary shall focus on the principal biological or physical constituent elements within the defined area that are essential to the conservation of the species. Known primary constituent elements shall be listed with the critical habitat description. Primary constituent elements may include, but are not limited to, the following: roost sites, nesting grounds, spawning sites, feeding sites, seasonal wetland or dryland, water quality or quantity, host species or plant pollinator, geological formation, vegetation type, tide, and specific soil types.

(c) Each critical habitat will be defined by specific limits using reference points and lines as found on standard topographic maps of the area. Each area will be referenced to the State(s), county(ies), or other local governmental units within which all or part of the critical habitat is located. Unless otherwise indicated within the critical habitat descriptions, the names of the State(s) and county(ies) are provided for information only and do not constitute the boundaries of the area. Ephemeral reference points (e.g., trees, sand bars) shall not be used in defining critical habitat.

(d) When several habitats, each satisfying the requirements for designation as critical habitat, are located in proximity to one another, an inclusive area may be designated as critical habitat.

The regulations confine designation to areas within United States jurisdiction:

h) Critical habitat shall not be designated within foreign countries or in other areas outside of United States jurisdiction. Sec. 424.12

The regulations define “special management considerations or protection.”

(j) Special management considerations or protection means any methods or procedures useful in protecting physical and biological features of the environment for the conservation of listed species. Sec. 424.02

### ***Approach to designation***

Based on this statutory and regulatory direction, our approach to designation included the following steps:

1. Identify specific areas eligible for critical habitat designation
  - Identify areas meeting the definition of critical habitat
  - Identify military areas ineligible for designation

2. Conduct a Section 4(b)(2) analysis:

Determine coextensive vs. incremental impacts

Determine the benefits of designation

Determine the benefits of exclusion

Determine whether benefits of exclusion of any particular area outweigh benefits of designation and recommend exclusions if appropriate

Determine whether the recommended exclusions will result in extinction of the species

## II. Identify Specific Areas Eligible for Critical Habitat Designation

### ***Identify areas meeting the definition of critical habitat***

Areas that meet the definition of critical habitat include specific areas: 1) within the geographical area occupied by the species at the time of listing, if they contain physical or biological features essential to conservation, and those features may require special management considerations or protection; and 2) outside the geographical area occupied by the species if the agency determines that the area itself is essential for conservation. Pursuant to section 3(5)(A), our first task was to determine “the geographical area occupied by the species at the time of listing.” In a separate report, we have documented our conclusions regarding which specific areas meet the definition of critical habitat and may therefore be eligible for designation (see Biological Report).

### ***Geographical Area Occupied by the Species***

Tracking data (Kelly et al. 2007, Lindley and Moser 2007, S. Lindley and M. Moser, unpublished data) genetic mixed stock analysis (Israel et al. 2004, B. May and J. Israel, unpublished data), direct observation, records of fisheries take and incidental take, and opportunistic sightings indicate that 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. Green sturgeon observed northwest of Graves Harbor, AK, and south of Monterey Bay, CA, have not been identified to DPS and may belong to either the Northern or Southern DPS. We took an inclusive approach when determining the geographical area occupied by the Southern DPS and defined it as the entire range occupied by green sturgeon (i.e., from the Bering Sea, AK, to Ensenada, Mexico). However, we cannot designate critical habitat in areas outside of the United States. Thus, the occupied geographical area under consideration for this designation was limited to areas from the Bering Sea, AK, to the U.S.-California/Mexico border, excluding Canadian waters.

### ***Physical or Biological Features Essential to Conservation***

We determined the physical or biological habitat features essential to the conservation of the Southern DPS based on their biology and life history, focusing on “primary constituent elements” as directed by our regulations. We considered the biology and life history of the Southern DPS, and regulatory direction gleaned from the ESA and the joint USFWS/NMFS regulations, to identify the physical or biological features essential to the species conservation. We 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, we identified PCEs for freshwater riverine systems, estuarine areas, and coastal marine waters.

The specific PCEs essential for the conservation of the Southern DPS in freshwater riverine systems are: food resources, substrate type or size, water flow, water quality, migratory corridors, water depth, and sediment quality. The specific PCEs essential for the conservation of the Southern DPS in estuarine areas are: food resources, water flow, water quality, migratory corridors, water depth, and sediment quality. The specific PCEs essential for the conservation of the Southern DPS in coastal marine areas include: migratory corridors, water quality, and food resources. Full descriptions of the PCEs can be found in the Proposed Rule published in the *Federal Register* and the draft Biological Report (NMFS 2008). Both documents are available at the Southwest Regional Office Web site at <http://swr.nmfs.noaa.gov>, or at the Federal eRulemaking Web site at <http://www.regulations.gov>.

### ***“Specific Areas” within the Occupied Geographical Area***

We identified specific areas within the geographical area occupied by the species by examining whether each specific area is presently occupied by the Southern DPS and contains at least one PCE that may require special management considerations or protection. To satisfy the first criterion, we determined for each specific area whether the presence of the Southern DPS was: (1) confirmed; (2) likely, based the presence of Northern DPS fish or green sturgeon of unknown DPS; or (3) possible, based on best professional judgment. We included all specific areas within freshwater riverine systems, bays and estuaries, and coastal marine waters for which we had evidence of confirmed or likely Southern DPS presence. We then verified that each area contained at least one PCE and that the PCE(s) may require special management considerations or protection. More detailed information on the specific areas, the PCEs present within each, and activities that may affect the PCEs such that special management considerations or protection may be required can be found in the Proposed Rule and the draft Biological Report (NMFS 2008).

The following specific areas were delineated in freshwater riverine systems, bypasses, and the Delta: (1) the upper Sacramento River; (2) the lower Sacramento River; (3) the Yolo Bypass; (4) the Sutter Bypass; (5) the lower Feather River; (6) the lower Yuba River; and (7) the Sacramento-San Joaquin Delta. The following specific areas were delineated in coastal bays and estuaries, including rivers to the head of the tide: (1) Elkhorn Slough, CA; (2) Suisun Bay, CA; (3) San Pablo Bay, CA; (4) San Francisco Bay, CA; (5) Tomales Bay, CA; (6) Noyo Harbor, CA; (7) Humboldt Bay, CA; (8) Eel River estuary, CA; (9) Klamath/Trinity river estuary, CA; (10) Rogue River estuary, OR; (11) Coos Bay, OR; (12) Winchester Bay, OR; (13) Siuslaw River estuary, OR; (14) Alsea River estuary, OR; (15) Yaquina Bay, OR; (16) Tillamook Bay, OR; (17) lower Columbia River estuary, OR and WA; (18) Willapa Bay, WA; (19) Grays Harbor, WA; and (20) Puget Sound, WA. The following specific areas were delineated in coastal marine waters within 110 m depth: (1) from the U.S.-CA/Mexico border to Monterey Bay, CA; (2) from Monterey Bay, CA, to San Francisco Bay, CA (including Monterey Bay); (3) from San Francisco Bay, CA, to Humboldt Bay, CA; (4) from Humboldt Bay, CA, to Coos Bay,



OR; (5) from Coos Bay, OR, to Winchester Bay, OR; (6) from Winchester Bay, OR, to the Columbia River estuary, OR and WA; (7) from the Columbia River estuary, OR and WA, to Willapa Bay, WA; (8) from Willapa Bay, WA, to Grays Harbor, WA; (9) from Grays Harbor, WA, to the U.S.-WA/Canada border; (10) the Strait of Juan de Fuca, WA; (11) from the U.S.-AK/Canada border to Yakutat Bay, AK; and (12) coastal Alaskan waters northwest of Yakutat Bay, AK, to the Bering Strait (including the Bering Sea).

### ***Special Management Considerations or Protection***

Agency regulations 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 critical habitat review team (CHRT) and the economic report, we verified that at least one activity in each specific area may threaten at least one PCE such that special management considerations or protection may be required, as defined by our regulations. 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, road building and maintenance, forestry, grazing, agriculture, and urbanization; (5) National Pollutant Discharge Elimination System (NPDES) activities and activities generating non-point source pollution; (6) power plants; (7) commercial shipping; (8) aquaculture; (9) desalination plants; (10) proposed tidal energy or wave energy projects; (11) Liquefied Natural Gas (LNG) projects; (12) habitat restoration; (13) agriculture; and (14) bottom trawl fisheries. 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 levels, erosion and sediment input/transport, physical habitat structure, vegetation, soils, nutrients and chemicals, fish passage, and stream/estuarine/marine benthic biota and prey resources.

### ***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 determined 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 high risk of extirpation due to catastrophic events.

The CHRT identified seven unoccupied areas in the Central Valley, California, that may provide additional spawning habitat for the Southern DPS of green sturgeon and *may be essential* for conservation of the species. 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. Of these seven areas, the CHRT identified reaches upstream of Daguerre Dam on the Yuba River as the most important for conserving the species because: (1) the current habitat conditions are likely to support spawning; (2) adult Southern DPS fish currently occupy habitat just below the Daguerre Dam; (3) although the Yuba River is part of the Sacramento River drainage basin, it is separated spatially from the current, single spawning population on the upper Sacramento River such that if a catastrophic mortality event were to occur in the upper Sacramento River, a Yuba River population could safeguard the species from extinction; and (4) there is a greater potential for removal of the Daguerre Dam or restoration of fish passage at the dam in the near future than for any of the other dams located within the unoccupied areas identified by the CHRT. The CHRT also felt that reaches on the San Joaquin River, from the South Delta to the Goodwin Dam on the Stanislaus River, are important for conserving the Southern DPS for some of the same reasons mentioned above, particularly that the San Joaquin and Stanislaus rivers are part of an entirely different drainage basin than the current single spawning area in the upper Sacramento River. However, the CHRT was less certain regarding the prospects for reestablishing a spawning population in this area.

The CHRT was able to determine that these seven unoccupied areas *may be essential*, but not that they *are essential*, to the conservation of the Southern DPS at this time. Thus, these seven unoccupied areas were not considered further for designation as critical habitat. The CHRT believed it is likely that at least one additional spawning area is needed to support the conservation of the Southern DPS, but that there is insufficient information at this time 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). The development of a recovery plan could help address the latter question by establishing recovery actions (e.g., removal of barriers on the Yuba River) and recovery criteria (e.g., establishing at least two additional spawning populations for the Southern DPS in rivers south of the Eel River) to achieve the delisting of the Southern DPS. We encourage actions that would protect, conserve, and/or enhance habitat conditions for the Southern DPS (e.g., habitat restoration, removal of dams, and the establishment of fish passage) within these areas. We request additional information from the public regarding these presently unoccupied areas and their historical, current, and potential use by green sturgeon. Additional information would inform our consideration of these areas for the final designation as well as future recovery planning for the Southern DPS.

### ***Military areas ineligible for designation***

Recent amendments to the ESA preclude the Secretary from designating military lands as critical habitat if those lands are subject to an Integrated Natural Resource Management Plan (INRMP) under the Sikes Act and the Secretary certifies in writing that the plan benefits the listed species (Section 4(a)(3), Public Law. No. 108-136). We contacted the Department of Defense (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, six facilities with INRMPs (Bremerton Naval Hospital; Naval Air Station, Everett; Naval Magazine Indian Island; Naval Fuel Depot, Manchester; Naval Undersea Warfare Center, Keyport; and Naval Air Station, Whidbey Island) were determined to overlap with the specific areas under consideration for critical habitat designation. All of these areas are located in Puget Sound, WA. Each of the INRMPs contain measures for listed salmon and bull trout, or measures that benefit fish species, that would also benefit green sturgeon. Thus, we determined that the areas within these six DOD facilities in Puget Sound, WA, were not eligible for designation as critical habitat.

### III. Conduct a Section 4(b)(2) Analysis

Section 4(b)(2) of the ESA requires us to use the best scientific information available in designating critical habitat. It also requires that before we may designate any “particular” area, we must consider the economic impact, impact on national security, and any other relevant impact. Once impacts are determined, the agency is to weigh the benefits of excluding any particular area (that is, avoiding the economic, national security, or other costs) against the benefits of designating it (that is, the conservation benefits to the species). If the agency concludes that the benefits of exclusion outweigh the benefits of designation, it has discretion to exclude, so long as exclusion will not result in extinction of the species.

#### ***Identify “Particular” Areas***

The first step in conducting the ESA section 4(b)(2) analysis is to identify the “particular areas” to be analyzed. The “particular areas” considered for exclusion are defined based on the impacts identified. 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 had identified under section 3(5)(A) (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 designation. Delineating particular areas based on impacts on national security, impacts on tribes, or other relevant impacts would likely be based on land ownership or control (e.g., land controlled by the DOD within which national security impacts may exist, or Tribal lands). At this time, however, we have not identified any national security impacts, impacts on tribes, or other relevant impacts of designation and therefore have not delineated any particular areas on the basis of these impacts.

#### ***Determine Co-extensive Impacts vs. Incremental Impacts***

Section 4(b)(2) of the ESA provides that the Secretary shall consider “the economic impact, impact to national security, and any other relevant impact of specifying any particular area as critical habitat.” The primary impact of a critical habitat designation stems from the requirement under section 7(a)(2) of the ESA that Federal agencies ensure 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. The true impact of designation is the extent to which Federal agencies modify their actions to insure their actions are not likely to destroy or adversely modify the critical habitat of the species, beyond any modifications they would make because of the listing and the jeopardy requirement. 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. We discuss the benefits of designation in the "Benefits of Designation" section below.

In determining the impacts of designation, we predicted the incremental change in Federal agency actions as a result of 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 "coextensive" 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 (10<sup>th</sup> Cir. 2001)) (NMCA). The Service had determined there would be no economic impact from the designation because the impacts associated with jeopardy determinations and adverse modification determinations were co-extensive. The Tenth Circuit found the Service's approach rendered meaningless Congress's requirement that economic impacts be considered in the designation process. The Court concluded that, to give "effect to Congressional directive," the Service must analyze the full impacts of designation, regardless of whether those impacts are coextensive with other impacts (such as the impact of the jeopardy avoidance requirement). The "coextensive" 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 of the species' habitat and 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 (5<sup>th</sup> Cir. 2001) (*Sierra Club*)) and the Court of Appeals for the Ninth Circuit (*Gifford Pinchot Task Force v. FWS*, 378 F. 3d 1059 (9<sup>th</sup> Cir. 2004) (*Gifford Pinchot*)) invalidated our regulatory definition of "adverse modification" of critical habitat. The Court's decision did not address the regulatory definition of jeopardy. Shortly following that decision, a District Court in Washington, D.C. issued a decision involving the U.S. Fish and Wildlife Service'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 citing guidance from the Office of Management and Budget in support of that proposition. The *Case Hatteras* Court concluded that the problem with the Service's analysis of economic impacts resulted from its treatment of "adverse modification" and "jeopardy" as being functionally equivalent. The Court ordered the Fish and Wildlife Service "to clarify or modify its position [regarding functional equivalence] on

remand,” implying that the *Gifford Pinchot* Court’s holding might have an effect on the agency’s historical treatment of the jeopardy and adverse modification requirements as providing coextensive protections.

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. Our methods for estimating the impacts of designation for economic impacts are summarized in the section below titled “Determining the Benefits of Excluding Particular Areas.” Because section 4(b)(2) requires a balancing of competing considerations, we have concluded that we must uniformly consider impacts and benefits. Though we do not propose exclusions based on national security impacts or other relevant impacts, we would also focus on incremental impacts in such an analysis. 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 because the jeopardy provision still applies.

A draft Economic Analysis Report (Industrial Economics, Inc. 2008) and draft Biological Report (NMFS 2008) describe 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 relative level of economic impacts that might result from such changes.

### ***Determine the benefits of designation***

The primary benefit of designation is the protection afforded under section 7 of the ESA, requiring all Federal agencies to ensure 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 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 to monetize the benefits of designation (e.g., estimates of the monetary value of the PCEs within areas designated as critical habitat, or of the monetary value of education and outreach benefits). As an alternative approach, we used the CHRT’s conservation value ratings (High, Medium Low and Ultra-low) to represent the qualitative conservation benefits of designation for each of the specific areas identified as critical habitat for the Southern DPS. The CHRT considered a number of factors to determine the conservation value of an area for the Southern DPS, including the PCEs present and their condition, the life stages supported, and whether the occurrence of Southern DPS green sturgeon within the specific area was confirmed or likely. 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 present in, habitat functions provided by each area, and the importance of protecting the habitat for the overall conservation of the species. The draft Biological Report (NMFS 2008) provides detailed information on the CHRT's evaluation of the specific areas and the qualitative conservation benefits for each area.

### ***Determine the benefits of exclusion***

To determine the benefits of excluding particular areas from designation, we considered the Federal activities that may be subject to a section 7 consultation and the range of potential changes that may be required for each of these activities under the adverse modification provision, beyond those changes that may 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. Because the Southern DPS was recently listed under the ESA in 2006, we lack an extensive consultation history. Thus, we relied on the 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. These include: (1) the installation and operation of dams; (2) the installation and operation of water diversions; (3) in-water construction or alterations; (4) dredging operations and disposal of dredge material; (5) NPDES activities and activities generating non-point source pollution, such as agricultural runoff; (6) power plant operations; (7) operations of liquefied natural gas (LNG) projects; (8) discharges from desalination plants; (9) commercial shipping (e.g., discharges, oil spills); (10) aquaculture; (11) tidal or wave energy projects; (12) bottom trawl fisheries; and (13) habitat restoration.

We then considered the range of modifications we might seek in these activities to avoid destroying or adversely modifying critical habitat of the Southern DPS. 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. For each potential impact, we tried to provide information on whether the impact is more closely associated with adverse modification or with jeopardy, to distinguish the impacts of applying the jeopardy provision versus the adverse modification provision. We recognize that differences exist between the biology of 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. 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 relied on the best information available for analog species (i.e., the listed salmonids) to guide our decision-making. Additional information on differences in habitat needs, life history strategies, and behavior of these species, particularly as they relate to potential project modifications, may allow us to refine our analysis.

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 draft Economic Analysis Report (Industrial Economics, Inc. 2008) for additional details). Thus, the estimated economic impacts represent the incremental impact of the designation. Our determination of these incremental economic impacts was based on the best available information. Additional information, including relevant information on differences in the biology of listed salmonids and green sturgeon, would be considered in developing the economic analysis supporting the final designation. The draft Economic Analysis Report (Industrial Economics, Inc. 2008) 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 draft Economic Analysis Report (Industrial Economics, Inc. 2008) describes in detail the actions we identified that may be affected by the critical habitat designation, the potential range of changes we might seek in those actions, and the estimated level of economic impacts that might result from those changes.

The conservation benefit to the species resulting from the designation of a particular area as critical habitat is not directly comparable to the economic benefit, benefit to national security, or other relevant benefit resulting from the exclusion of a particular area 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, to weigh the benefits of designation against the benefits of exclusion, we compared the conservation value ratings with the range of low to high annualized economic cost estimates (discounted at 7%; see Economic Report for additional details) for each area (Table 1 and Figure 1). We identified areas eligible for exclusion based on four decision rules: (1) all areas with a conservation value rating of “High” were not eligible for exclusion regardless of the level of economic impact because of the threatened status of the green sturgeon; (2) areas with a conservation value rating of “Medium” were eligible for exclusion if the high annualized economic impact estimate exceeded \$100K; (3) areas with a conservation value rating of “Low” were eligible for exclusion if the high annualized economic impact estimate exceeded \$10K; and (4) areas with a conservation value rating of “Ultra-low” were eligible for exclusion if the high annualized economic impact

estimate exceeded \$0. 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. Under the ESA, we are to weigh dissimilar impacts given limited time and information. The statute 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 directs us to consider exclusions to avoid high economic impacts, but also requires that the areas designated as critical habitat are sufficient to support the conservation of the species and to avoid extinction. In this policy context, we selected dollar thresholds representing the levels at which we believe the economic impact associated with a specific area would 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, 15 areas were identified as eligible for exclusion (Table 1): (1) coastal marine waters within 110 m depth northwest of Yakutat Bay, AK, to the Bering Strait (including the Bering Sea); (2) coastal marine waters within 110 m depth from the U.S.-Alaska/Canada Border to Yakutat Bay, AK; (3) Puget Sound, WA; (4) Tillamook Bay, OR; (5) Alsea River, OR; (6) Siuslaw River, OR; (7) Rogue River, OR; (8) Coos Bay, OR; (9) Klamath/Trinity River, CA; (10) Eel River, CA; (11) lower Feather River; (12) Noyo Harbor, CA; (13) Elkhorn Slough, CA; (14) Tomales Bay, CA; (15) coastal marine waters within 110 m depth from the CA-Mexico border to Monterey Bay, CA.

We asked the CHRT whether excluding any of the 15 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 providing the conservation value ratings.

The CHRT determined, and we concur, that exclusion of the following 11 areas eligible for exclusion would not significantly impede conservation or result in extinction of the species (Table 1): (1) coastal marine waters within 110 m depth northwest of Yakutat Bay, AK, to the Bering Strait (including the Bering Sea); (2) Tillamook Bay, OR; (3) Siuslaw River estuary, OR; (4) Alsea River estuary, OR; (5) Rogue River estuary, OR; (6) Klamath/Trinity River estuary, CA; (7) Eel River estuary, CA; (8) Noyo Harbor, CA; (9) Tomales Bay, CA; (10) Elkhorn Slough, CA; and (11) coastal marine waters within 110 m depth from the CA-Mexico border to Monterey Bay, CA. The CHRT based their determination on the fact that each of these 11 areas was assigned a Low or Ultra-Low conservation value and Southern DPS fish have not been documented to use these areas extensively. The bays and estuaries listed above and recommended for exclusion may not be used often by Southern DPS fish because of their small size compared to other bays and estuaries that are used extensively by green sturgeon and that consequently received higher conservation ratings. In addition, Southern DPS fish are not believed to use Northern DPS spawning systems extensively (i.e., the Klamath/Trinity River and the Rogue River). The CHRT also recognized that few green sturgeon (of unknown DPS) have been observed in coastal marine waters within 110 m depth from the California/Mexico border to Monterey Bay, CA, and northwest of Yakutat Bay, AK, to the Bering Strait (including the



Bering Sea), indicating low use of the area by the Southern DPS. For these reasons, the CHRT concluded that excluding the bays, estuaries, and coastal marine areas mentioned above from the designation would not significantly hinder the conservation of the Southern DPS and will not result in extinction of the species. Thus, we propose to exclude these 11 specific areas from the critical habitat designation for the Southern DPS. We recognize that the lack of documented evidence of Southern DPS in these areas may be because these areas are not adequately monitored for green sturgeon. Directed surveys in these areas are encouraged.

The CHRT also reevaluated the four areas of Medium conservation value that were eligible for exclusion, to determine whether excluding the areas would significantly impede conservation or result in extinction of the species: the lower Feather River, CA; Coos Bay, OR; Puget Sound, WA; and coastal marine waters within 110 m depth from the Alaska/Canada border to Yakutat Bay, AK.

The CHRT determined that exclusion of Puget Sound would not significantly impede conservation of the Southern DPS. Observations of green sturgeon in Puget Sound are much less common compared to the other estuaries in Washington state. Although two confirmed Southern DPS fish were detected in Puget Sound in 2006, the extent to which Southern DPS green sturgeon use this area remains uncertain. Very few green sturgeon have been observed in Puget Sound, despite a long history of commercial and recreational fishing and fishery-independent monitoring of other species that use habitats similar to those used by green sturgeon. In addition, Puget Sound was not considered to be part of the coastal migratory corridor used by Southern DPS fish to reach overwintering grounds off Vancouver Island and further north (S. Lindley and M. Moser, NMFS, 2008, pers. comm.). 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, we propose to exclude Puget Sound from the critical habitat designation for the Southern DPS, because the benefits of designation are outweighed by the benefits of exclusion, and because the exclusion of this area will not result in the extinction of the species.

The CHRT determined that exclusion of the lower Feather River would significantly impede the 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 occupied consistently 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 had assigned the lower Feather River a Medium conservation value, but noted that modifications to improve habitat conditions (e.g., improved passage, restoration of water flow) are both logistically and financially feasible and would raise the conservation value to a High. There is a relatively high degree of certainty that altering certain activities will protect the lower Feather River's PCEs and could improve habitat conditions for the Southern DPS substantially. Thus, we propose to designate the lower Feather River as critical habitat for the Southern DPS given the high conservation potential of this area. We solicit additional information from the public regarding designation of the lower Feather River, particularly information regarding the

economic costs associated with activities that may be affected by a critical habitat designation and on the conservation benefits to green sturgeon provided by this area.

The CHRT also determined that exclusion of Coos Bay would significantly impede conservation of the Southern DPS. The CHRT identified Coos Bay as an important area for the Southern DPS, for several reasons. Coos Bay is the largest, deepest estuary along the Oregon coast presently occupied by green sturgeon. Although tagging data indicate that use of Coos Bay by Southern DPS fish is lower than use of Winchester Bay, Coos Bay provides a protected area for green sturgeon aggregation and feeding, has a large mixing zone, and is an important “stepping-stone” estuary between San Francisco Bay and the lower Columbia River estuary. The economic analysis revealed that there is a great degree of uncertainty regarding the costs associated with a designation in this area. The uncertainty is largely driven by the possible placement of one LNG terminal inside the bay, a limited understanding of how LNGs will affect green sturgeon PCEs, and uncertainty regarding how LNG activities might be altered in order to avoid adversely modifying green sturgeon critical habitat. Because there is great uncertainty regarding the proposed LNG project at this time, we considered the lower economic impact estimate (\$19,000) to be more reasonable than the higher cost estimate of \$16 million. Based on this information, we propose to designate Coos Bay as critical habitat for the Southern DPS, because the conservation value of the area outweighs what we consider to be the more realistic economic cost of designation (i.e., approximately \$19,000). At this time, we propose that designating critical habitat in Coos Bay will provide conservation value to the species and reduce extinction risk. We acknowledge, however, that additional information received, in particular information regarding additional costs incurred by the LNG industry as a result of this critical habitat designation, may inform our analysis such that reconsideration of the proposed designation of Coos Bay may be warranted. We solicit additional data and comments regarding designation of Coos Bay, particularly information regarding the economic costs associated with LNG projects that may occur as a result of a critical habitat designation, and on the conservation benefits to green sturgeon provided by this area.

The CHRT expressed a great degree of uncertainty as to whether the exclusion of coastal marine waters within 110 m depth from the U.S.-Alaska/Canada Border to Yakutat Bay, AK would significantly impede conservation or result in the extinction of the species. Some CHRT members said that because presence of Southern DPS fish in this area has been confirmed despite the fact that the detection system in Graves Harbor, AK, is not designed to detect green sturgeon (i.e. the spatial arrangement and coverage of the array is not ideal for detecting green sturgeon) and data has only been collected from 2005-2006 and not beyond because of unresolved data coordination issues, that the use of habitat in southeast Alaska by Southern DPS fish is likely higher than what the data indicate and that the exclusion of this area from the designation might impede conservation of the Southern DPS. Other CHRT members stated that the relatively low number of Southern DPS detections in the area in combination with the uncertainty surrounding the activities occurring in southeast Alaska suggests that excluding this area from the designation would not significantly impede conservation of the species. Some CHRT members abstained from commenting on whether the exclusion of southeast Alaska from the designation would significantly impede conservation of the species. At this time, we determine that exclusion of the coastal marine area within 110 m depth from the Alaska/Canada

border to Yakutat Bay, AK, will not result in extinction of the Southern DPS and propose to exclude this area from the critical habitat designation. We solicit the public for more information regarding: (1) the presence of green sturgeon in Southeast AK; (2) the spatial distribution of aforementioned PCEs in Southeast AK; (3) activities occurring in Southeast AK that may effect the aforementioned PCEs; (4) the types of changes that might be proposed for these activities in order to avoid impacts on Southern DPS PCEs; and (5) estimated costs associated with making these changes.

In summary, we propose to exclude the following 13 areas from the proposed critical habitat designation: (1) coastal marine waters within 110 m depth northwest of Yakutat Bay, AK, to the Bering Strait (including the Bering Sea); (2) coastal marine waters within 110 m depth from the U.S.-Alaska/Canada Border to Yakutat Bay, AK; (3) Puget Sound, WA; (4) Tillamook Bay, OR; (5) Alsea River estuary, OR; (6) Siuslaw River estuary, OR; (7) Rogue River estuary, OR; (8) Klamath/Trinity River estuary, CA; (9) Eel River estuary, CA; (10) Noyo Harbor, CA; (11) Tomales Bay, CA; (12) Elkhorn Slough, CA; and (13) coastal marine waters within 110 m depth from the CA-Mexico border to Monterey Bay, CA. Based on the best scientific and commercial data currently available, we have determined that the exclusion of these areas will not result in the extinction of the Southern DPS. Please see Figure 2 for a map depicting the areas being proposed for the Southern DPS green sturgeon critical habitat designation.

### ***Exclusions Based on National Security***

We have contacted the DOD regarding any DOD areas that may overlap with areas proposed for designation as critical habitat for the Southern DPS. Discussions with the DOD indicated that impacts on national security may exist within the proposed areas. We are aware of DOD areas in the Strait of Juan de Fuca that have been excluded on the basis of national security impacts for Southern Resident killer whales and Puget Sound salmon, as well as DOD areas off the coasts of California and Washington that may be affected by a critical habitat designation. At this time, we have not received information regarding impacts on national security within these areas; however, we will analyze any information received from the DOD regarding impacts on national security within the proposed critical habitat areas in our development of the final designation. We request information specifically pertaining to whether the designation for such sites as critical habitat for the Southern DPS would result in national security impacts that would outweigh the benefits of designation. We will continue working with the DOD to identify impacts on national security and to determine whether additional military areas that may be eligible for exclusion exist within the proposed critical habitat designation.

### ***Potential Exclusions for Indian Lands***

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. For this proposed critical habitat designation for Southern DPS green sturgeon, we reviewed maps indicating that very few if any areas under consideration as critical habitat actually overlap with Indian lands. Nearshore coastal areas comprise the vast majority of these possible overlap areas, but it is unclear which if any Indian lands are subject to consideration for possible exclusion. In particular, we lack information regarding where Indian land boundaries lie in relation to shoreline tidal boundaries used to identify the lateral extent in this proposed rule. Our preliminary assessment indicates that the following federally-recognized tribes (73 FR 18553, April 4, 2008) have lands that may be in close proximity to areas under consideration 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. (see Figure 3).

We will seek comments regarding these areas and will continue to investigate whether any Indian lands overlap, and may warrant exclusion from, critical habitat for Southern DPS green sturgeon. 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. We will also seek information from affected tribes concerning other tribal activities that may be affected in areas other than tribal lands (i.e., bottom trawling and alternative energy projects in marine areas).

If such areas are identified, the benefits of exclusion could include those we 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. We will address the outcome of any such assessment in the agency's final 4(b)(2) report and associated rulemaking.

## IV. Tables and Figures

**Table 1.** Comparison of conservation ratings (High-highlighted in green, Medium-highlighted in yellow, Low-highlighted in orange, and Ultra-low-highlighted in red) and economic impact categories (High-highlighted in green, Medium-highlighted in yellow, Low-highlighted in orange, and Ultra-low-highlighted in red) for Specific Areas occupied by the Southern Distinct Population Segment of green sturgeon. Eligibility for exclusion (Y or N), whether exclusion of the area will significantly impede conservation (Y or N), and whether exclusion of the area will result in extinction of the species (Y or N) are shown. Those areas proposed for exclusion are highlighted in magenta.

UNIT NUMBER	SPECIFIC AREA	CONSERVATION VALUE	LOW ANNUALIZED IMPACTS (7 PERCENT)	HIGH ANNUALIZED IMPACTS (7 PERCENT)	Eligible for Exclusion?	Would exclusion significantly impede conservation?	Would exclusion result in extinction of the species?
29	Monterey Bay, CA, to San Francisco Bay, CA *	High	\$3,000,000	\$23,000,000	No	N/A	N/A
24	Lower Columbia River estuary *	High	\$2,600,000	\$3,100,000	No	N/A	N/A
3	Lower Sacramento River, CA	High	\$2,400,000	\$2,400,000	No	N/A	N/A
8	Sacramento-San Joaquin Delta, CA	High	\$960,000	\$2,400,000	No	N/A	N/A
11	San Francisco Bay, CA	High	\$770,000	\$770,000	No	N/A	N/A
10	San Pablo Bay, CA	High	\$410,000	\$560,000	No	N/A	N/A
2	Upper Sacramento River, CA	High	\$320,000	\$2,300,000	No	N/A	N/A
9	Suisun Bay, CA	High	\$320,000	\$390,000	No	N/A	N/A
31	Humboldt Bay, CA, to Coos Bay, OR *	High	\$320,000	\$390,000	No	N/A	N/A
30	San Francisco Bay, CA, to Humboldt Bay, CA *	High	\$210,000	\$280,000	No	N/A	N/A
33	Winchester Bay, OR, to Columbia R. estuary *	High	\$150,000	\$660,000	No	N/A	N/A
37	Strait of Juan de Fuca, WA	High	\$140,000	\$250,000	No	N/A	N/A
34	Columbia R. estuary to Willapa Bay, WA *	High	\$61,000	\$69,000	No	N/A	N/A
32	Coos Bay, OR, to Winchester Bay, OR *	High	\$54,000	\$270,000	No	N/A	N/A
36	Grays Harbor, WA, to U.S.-Washington/Canada Border *	High	\$30,000	\$30,000	No	N/A	N/A
26	Grays Harbor, WA	High	\$23,000	\$23,000	No	N/A	N/A
25	Willapa Bay, WA	High	\$16,000	\$6,800,000	No	N/A	N/A
35	Willapa Bay, WA, to Grays Harbor, WA *	High	\$2,000	\$9,800	No	N/A	N/A
27	Puget Sound, WA	Medium	\$2,100,000	\$2,100,000	Yes	No	No
6	Lower Feather River, CA	Medium	\$770,000	\$770,000	Yes	Yes	Yes
38	U.S.-Alaska/Canada Border to Yakutat Bay, AK *	Medium	\$240,000	\$240,000	Yes	?	No
7	Lower Yuba River, CA	Medium	\$53,000	\$53,000	No	N/A	N/A
4	Yolo Bypass, CA	Medium	\$29,000	\$29,000	No	N/A	N/A
18	Coos Bay, OR	Medium	\$19,000	\$16,000,000	Yes	Yes	?
19	Winchester Bay, OR	Medium	\$14,000	\$14,000	No	N/A	N/A
15	Humboldt Bay, CA	Medium	\$8,100	\$8,100	No	N/A	N/A
5	Sutter Bypass, CA	Medium	\$4,200	\$4,200	No	N/A	N/A
12	Tomales Bay, CA	Low	\$120,000	\$1,600,000	Yes	No	No
28	U.S.-California/Mexico border to Monterey Bay, CA *	Ultra-low	\$3,500,000	\$130,000,000	Yes	No	No
39	Yakutat Bay, AK, northwest to the Bering Strait *	Ultra-low	\$2,600,000	\$170,000,000	Yes	No	No
1	Elkhorn Slough, CA	Ultra-low	\$200,000	\$200,000	Yes	No	No
13	Noyo Harbor, CA	Ultra-low	\$99,000	\$99,000	Yes	No	No
23	Tillamook Bay, OR	Ultra-low	\$11,000	\$11,000	Yes	No	No
20	Siuslaw River estuary, OR	Ultra-low	\$8,400	\$8,400	Yes	No	No
21	Alsea River estuary, OR	Ultra-low	\$7,400	\$7,400	Yes	No	No
14	Eel River estuary, CA	Ultra-low	\$4,000	\$4,000	Yes	No	No
16	Klamath River estuary, CA	Ultra-low	\$3,000	\$3,000	Yes	No	No
17	Rogue River estuary, OR	Ultra-low	\$1,500	\$1,500	Yes	No	No
22	Yaquina River estuary, OR	Ultra-low	\$0	\$0	No	N/A	N/A

Figure 1. Map depicting each specific area and its conservation value rating (High=green, Medium = yellow, Low=red, and Ultra-low=blue). These ratings were weighed against the economic costs associated with designating them as critical habitat (see Table 1). Specific areas where the cost of designating critical habitat outweighed the conservation benefit that would come from designating it are signified with a solid star.

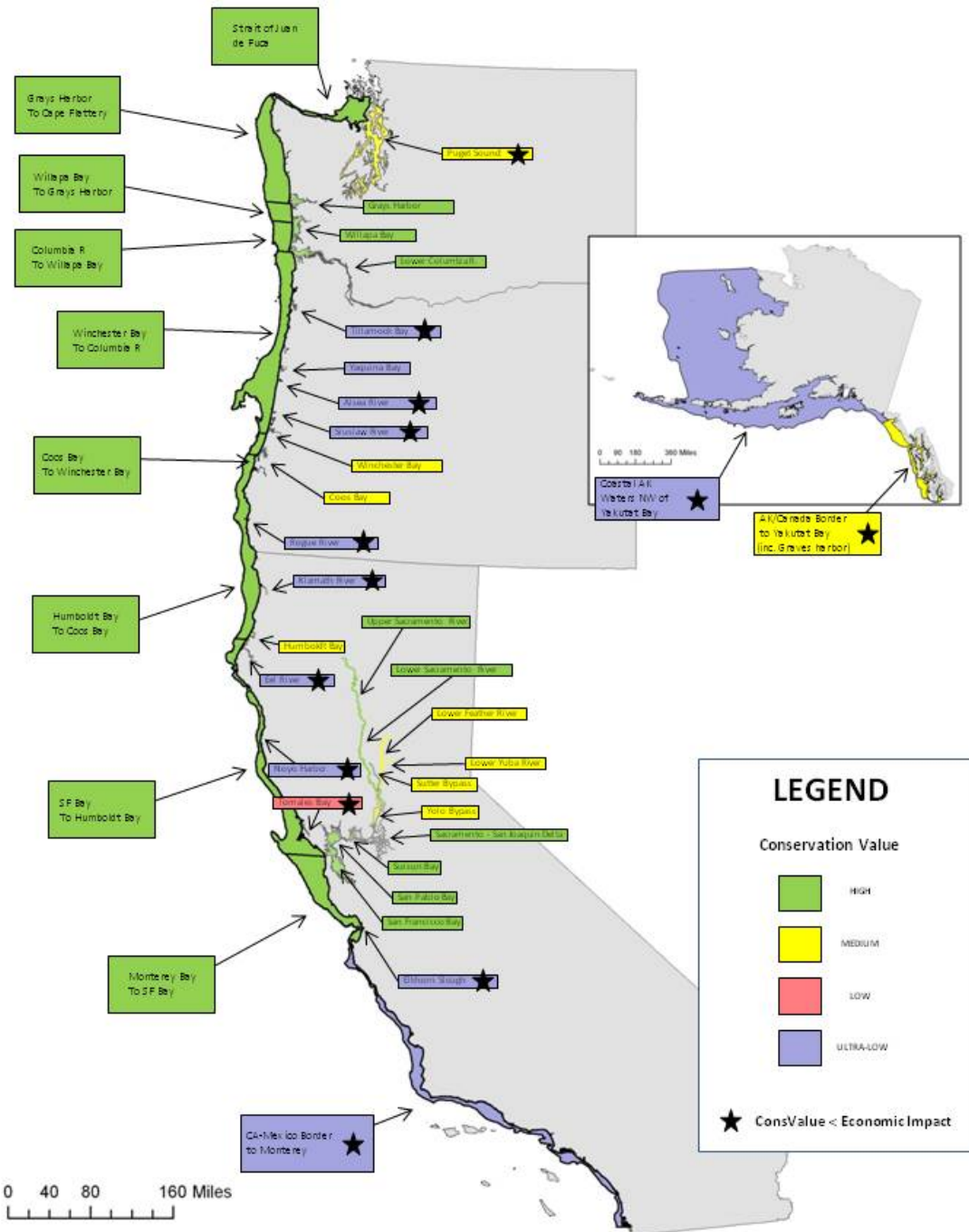


Figure 2. Map depicting the areas proposed for the Southern Distinct Population Segment of green sturgeon critical habitat designation.

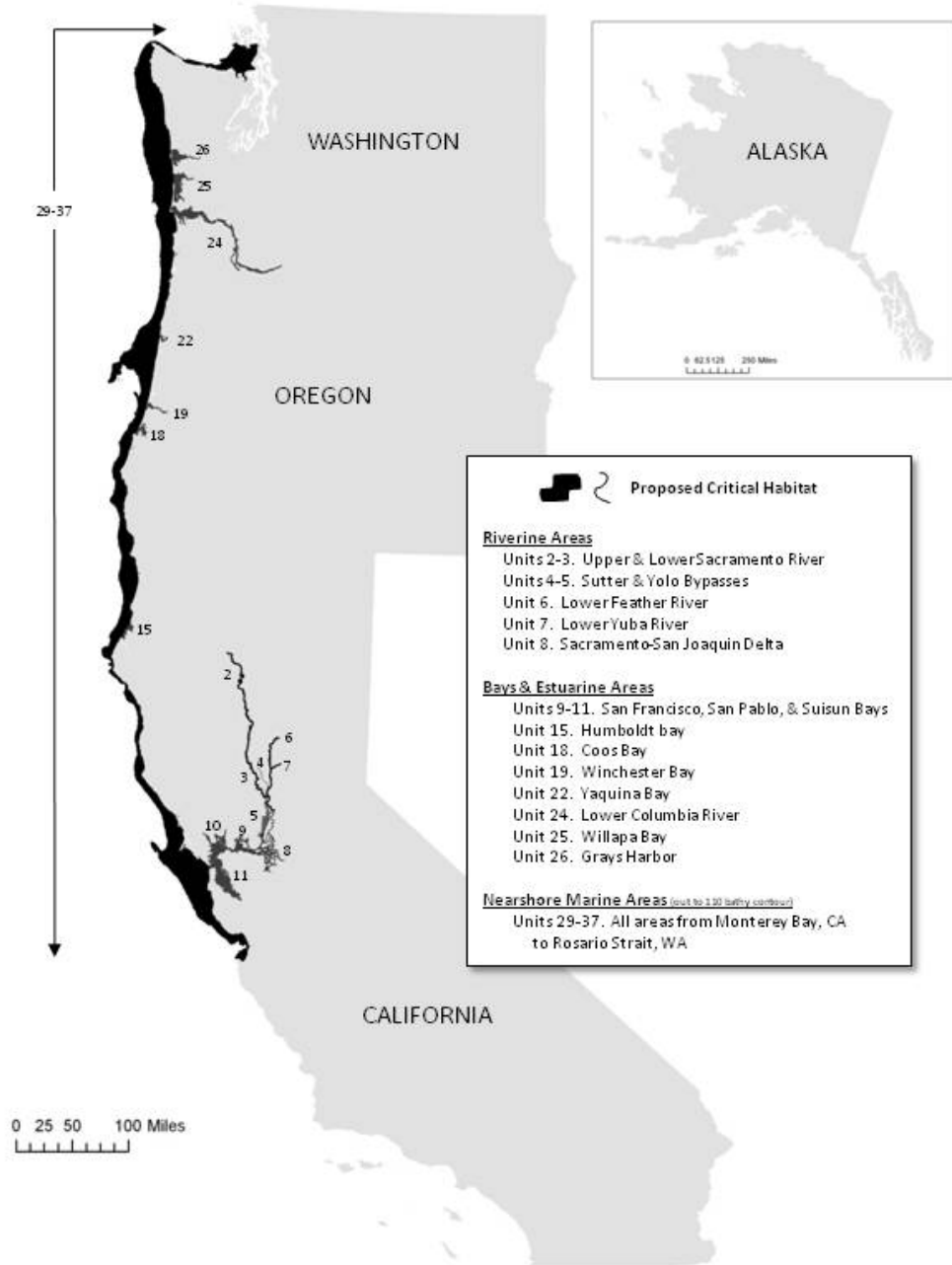
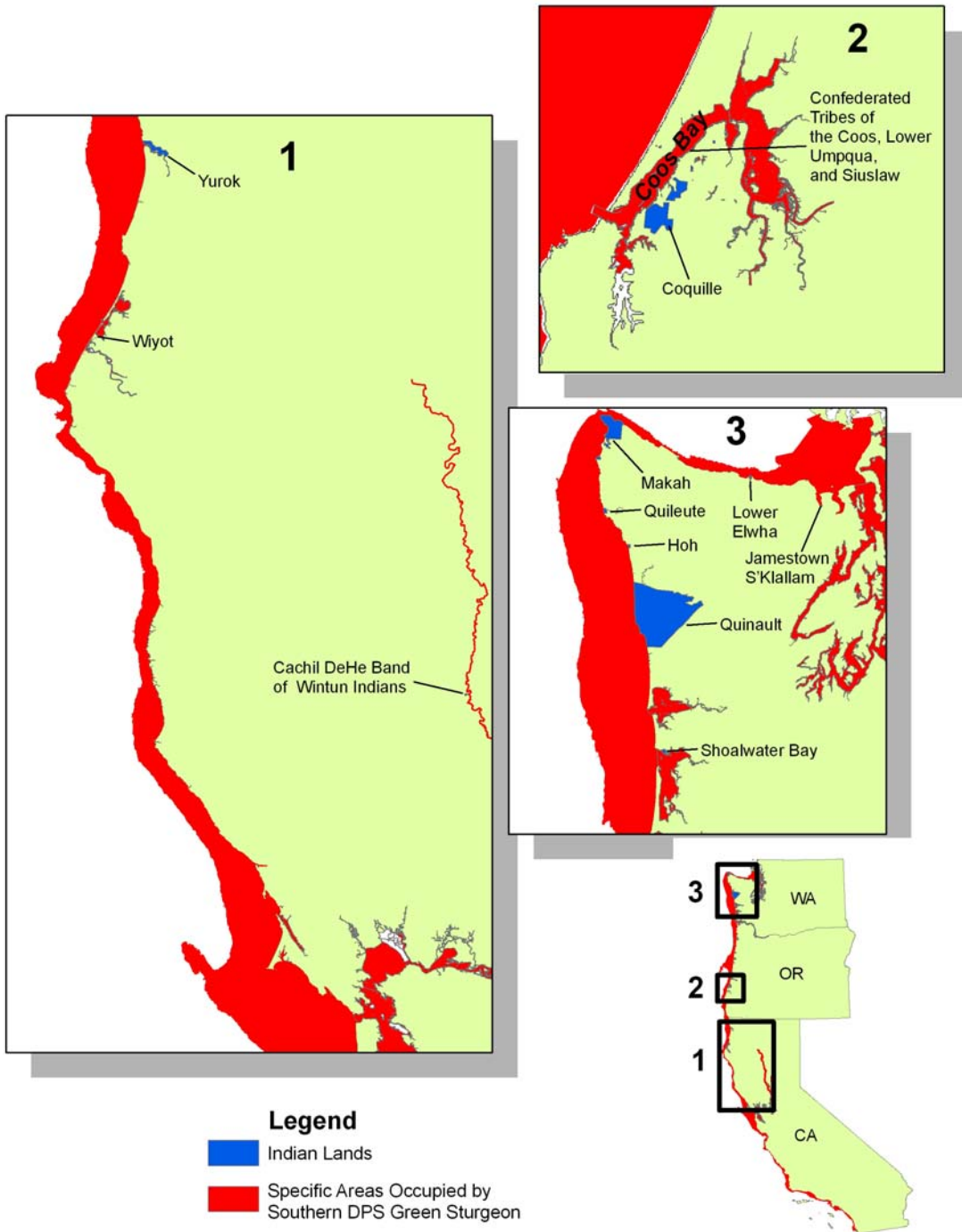


Figure 3. Preliminary map depicting Indian lands in close proximity to (and potential overlap with) areas under consideration for critical habitat designation for Southern DPS green sturgeon.





## V. References

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