

Southern and Northern Green Sturgeon

Interim Risk Assessment

Sturgeon are a long-lived fish, with some white sturgeon reported to be over 100 years old. This fact calls into question the use of criteria used in this report to assess the status of sturgeon. These criteria look at a relatively short time period – the last five years in some cases. This represents a small fraction of a sturgeon generation and likely cannot determine increasing or decreasing trends. ODFW recognizes that utilizing the NFCP interim criteria to assess the status of the three SMUs of sturgeon would not be appropriate. Therefore, we have not assessed the conservation risk to sturgeon in this report. ODFW will elevate the priority to develop conservation plans for these SMUs, which will allow more appropriate methods of status assessment to be considered. The outcomes of applying the NFCP interim criteria to these SMUs are included here to point out the limitations of the criteria and to share some information about these SMUs.

The green sturgeon (*Acipenser medirostris*) is one of two sturgeon species inhabiting Oregon. The species ranges along the Pacific coast from California to Southeast Alaska. Green sturgeon are found at least occasionally in all Oregon coastal estuaries and in lower reaches of Oregon coastal rivers, as well as in the open ocean in nearshore areas. Relatively little is known about the biology, behavior, and life history of green sturgeon, and concern has been expressed regarding its status. The species was petitioned for listing under the federal Endangered Species Act (ESA) in 2001. The National Marine Fisheries Service (now NOAA Fisheries) recently proposed listing the southern distinct population segment (DPS) as threatened under the ESA (NOAA Fisheries 2005). In the same document, NOAA Fisheries found the northern distinct population segment of green sturgeon was not warranted for protection under the ESA, but should be included as a Species of Concern. The species currently has no special status in Oregon.

Understanding the biology and status of the green sturgeon is complicated by the behavior and life history of the species. Green sturgeon spend much of their time in nearshore marine environments, where they are sometimes captured as bycatch in trawl fisheries targeting other species. Green sturgeon are migratory, utilizing the open ocean to travel vast distances between freshwater rivers. Tagged individuals released in the Sacramento River have been captured as far north as Willapa Bay, Washington, and tagged individuals released in the Columbia River have been captured as far north as Vancouver Island, British Columbia, and as far south as the Sacramento River. Green sturgeon tagged with radio transmitters in the Rogue River have been documented near Vancouver Island, British Columbia. Green sturgeon are also known to congregate during summer months in coastal estuaries such as Grays Harbor and Willapa Bay, Washington, and the Columbia River estuary. Limited sampling of stomachs of green sturgeon from summer congregations in the Columbia River has failed to find any evidence of feeding by these fish during their stay (ODFW internal documents and field notes).

Because of difficulties in capturing fish for research, much of the limited available information on the status of green sturgeon in Oregon is gleaned from harvest data. There are essentially no target fisheries for green sturgeon in Oregon – nearly all green sturgeon are captured as bycatch in commercial salmon, white sturgeon, and bottomfish target fisheries. Commercial value of green sturgeon is well below that of white sturgeon, although incidentally harvested green sturgeon are purchased and marketed by processors. Sport harvest occurs primarily as bycatch

during targeted white sturgeon fishing, although some sturgeon sport fisheries on the south coast of Oregon are known to target green sturgeon (especially in the Rogue and Umpqua rivers), as they are sometimes more abundant in smaller coastal rivers than white sturgeon.

Existing Populations

Green sturgeon spawning has been documented in the Klamath, Trinity, and Sacramento rivers, California, in the Rogue River, Oregon, and is believed to occur at least occasionally in the Umpqua River, Oregon. No evidence of reproduction by green sturgeon in summer congregating areas has been found. In absence of evidence of feeding and spawning, the exact reason for these congregations is unknown. Green sturgeon spawn in fast-flowing sections of the lower reaches of large coastal rivers. Green sturgeon are difficult to capture for research in these locations. Recent genetic evidence (Israel et al. 2004) suggests that green sturgeon collected in the Columbia River estuary and San Pablo Bay, California, are more closely related to each other than to fish collected in the Rogue, Klamath, and Trinity rivers. The Rogue, Klamath, and Trinity River fish were more closely related to each other. Lacking defined populations and documented spawning in Oregon in areas other than the Rogue River, we define green sturgeon in Oregon as two SMUs, reflecting the DPS definitions set forth by NOAA Fisheries. Only the Northern SMU is known to spawn in Oregon (Rogue River, possibly Umpqua River). Both SMUs are known to congregate in the Columbia River estuary and in Washington estuaries, indicating offshore migration along the coast. Therefore, these fish may use other coastal estuaries as well. Because green sturgeon migrate to similar areas along the coast and their natal stream fidelity is not known, it was not possible to identify distinct populations in each of the SMUs. Each SMU was considered as one population for this status assessment (Table 137).

Table 137. Populations list and existence status for green sturgeon SMUs.

Exist	Population	Description
Yes	Southern SMU	Spawn in Sacramento River. Found off Oregon coast, in coastal rivers and estuaries, and in Columbia River estuary and Washington estuaries.
Yes	Northern SMU	Spawn in Rogue River, Oregon and Klamath and Trinity rivers, California. Found off Oregon coast, in coastal rivers and estuaries, and in Columbia River estuary and Washington estuaries.

Habitat Use Distribution

To pass this criterion, a population must occupy at least 50% of historically used habitat. Currently, green sturgeon populations are believed to have access to nearly 100% of historically used habitat within Oregon. Green sturgeon typically occupy the lower reaches of coastal rivers, even in the absence of barriers to upstream migration. Man-made barriers, which are usually constructed farther upriver, are not believed to have limited the range of green sturgeon in Oregon waters. NOAA Fisheries' updated green sturgeon status review (NOAA Fisheries 2004) cites evidence of capture of one green sturgeon (presumed juvenile) at Rkm 254 on the Rogue River. This location is upstream of two dams with fish ladders. There is anecdotal evidence that some green sturgeon may have been harvested in commercial fisheries occurring above the site of Bonneville Dam on the Columbia River before the dam was constructed. Even if green sturgeon historically used a portion of the Columbia River above Bonneville Dam, it is not believed to have comprised more than 50% of the historic habitat. As a result, it is believed that the Northern Green Sturgeon SMU passes the habitat use distribution criterion

The Southern SMU is currently restricted to one spawning river in California (Sacramento). Two dams permanently block access to areas believed to be previously used spawning areas on the Sacramento River. Irrigation withdrawals also seasonally block green sturgeon spawning habitat on the Sacramento River. Green sturgeon use of the Feather River is undocumented, but a portion of that river is also permanently blocked. ODFW believes that over 50% of the historic spawning habitat for the Southern SMU has been blocked, and as a result, the SMU fails the habitat use distribution criterion.

Abundance

The salmonid criterion for abundance requires the population to be at least 25% of the historic abundance in at least three of the last five years. Very little is known about the present abundance of green sturgeon, and even less is known about their historic abundance. Nearly all evidence cited to describe green sturgeon abundance, historic and present, is derived from fisheries information in which green sturgeon have been non-target species. Because most harvest occurs as bycatch during other fisheries, landings of green sturgeon are of little use in comparing year-to-year abundance of the species. Fisheries that harvest green sturgeon as bycatch, notably Columbia River commercial salmon and white sturgeon fisheries, are highly variable and have been subject to many regulation changes over time. Reliable catch-per-effort data for green sturgeon are unavailable for recent years due to changes in annual regulations and harvest patterns of target fisheries. Catches of green sturgeon have been reduced in recent years. This reduction is not believed to be due to declining catch-per-effort, but is a response to market conditions, regulation changes, and changing fisheries for other species. It is generally believed that the Southern SMU has a lower abundance than the Northern SMU. Because the available abundance data are inconclusive, both SMUs fail the criterion. Precautionary application of the interim criteria treats inconclusive data as failure in assessment of risks to the SMU.

Productivity

Little to no information is available to assess productivity of green sturgeon in Oregon waters, as called for in the interim criteria. For this assessment, size distribution and availability of spawning habitat were used to infer whether each SMU was capable of rebuilding abundance from periods of low abundance, which is the intent behind the interim criterion for productivity.

The best available data for size distribution of green sturgeon captured in commercial fisheries indicates relatively balanced distributions of harvested size classes in recent years. Fish from each SMU harvested in these fisheries cannot be differentiated and are assumed here to represent the size distribution of both SMUs. This information is also limited to fish of legal harvest size (42-60 inches total length for sport, and 48-66 inches total length for commercial; changed in 2006 to 48-60 inches), and does not reflect the entire assemblage of sizes. Green sturgeon captured in freshwater are almost always adults, with a size range similar to the legal harvest limit. Captures of smaller fish are infrequent, although some seining efforts in the Rogue River and in sloughs of Coos Bay have captured juvenile fish (<50 cm total length). It is commonly believed that green sturgeon spend much of their pre-adult life in a marine or estuarine environment where they are difficult to capture. If the productivity of the population were poor, we would expect catch size distributions to reflect primarily the largest individuals, indicating lack of reproduction over time. This does not appear to be the case given the limited information available.

Spawning fish from the Northern SMU have access to two undammed, historically-used rivers in Oregon. Green sturgeon are known to spawn in the Rogue River, and believed to spawn, at least occasionally, in the Umpqua River. Limited spawning may occur in other streams occasionally, but this is speculative. Consistent recruitment of young-of-year and juvenile green sturgeon is documented in the Klamath and Trinity rivers of California, which make up part of the Northern SMU and contributes to its productivity. This fact combined with the size distribution data, leads to the northern SMU passing the productivity criterion.

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Reproductive Independence

To pass the reproductive independence criterion, over 90% of the spawners in a population must be naturally-produced in three of the last five years. There are currently no known hatchery-reared green sturgeon residing within the range of either SMU. Both SMUs pass this criterion.

Hybridization

To pass the hybridization criterion, the occurrence of interspecific hybridization must be rare or non-existent in three of the last five years. There are no known non-native species residing in either SMU that are capable of hybridizing with green sturgeon. Both SMUs pass this criterion.