

American and Asian forms of green sturgeon (Birstein and DeSalle, 1998), and consequently, these two forms are now considered separate species.

The petitioned action requested that North American green sturgeon be listed as a threatened or endangered species, but the petitioners also recognized that this species could be comprised of multiple DPSs. For this reason and because other sturgeon species have been divided into multiple DPSs, NMFS' BRT assessed the best available scientific information concerning the population structure of green sturgeon in North America in an effort to determine whether or not the biological species was comprised of one or more DPSs. Based on a review of the best available scientific information, NMFS has determined that North American green sturgeon are comprised of two populations that are both discrete and significant as defined in the DPS policy and are therefore DPSs. One is a northern DPS consisting of coastal populations ranging from the Eel River northward. The second is a southern DPS that includes any coastal or central valley populations south of the Eel River, with the only known population being in the Sacramento River. These DPSs and the information used to characterize them are summarized below, and discussed in greater detail in the green sturgeon status review (NMFS 2002).

**Discreteness:** Genetic data were analyzed from 66 green sturgeon sampled from the Klamath River in 1998, 46 fish sampled from San Pablo Bay in 2001, 15 sampled from the Rogue River in 2000, and 29 sampled from the Columbia River estuary in 1995. The analysis on this genetic data, while preliminary, suggest that green sturgeon from the Klamath River are genetically distinct from fish in San Pablo Bay, and that green sturgeon from the Klamath and Rogue River are similar to each other (Israel *et al.*, 2002). Green sturgeon from the Columbia River appear to be a mixture of fish from the San Pablo Bay, Klamath, and Rogue populations. Israel *et al.* (2002) suggest that the genetic data indicate that spawning could be occurring in some other unknown locations; however, this preliminary conclusion could change if larger samples were analyzed or if samples were collected from multiple years. While preliminary, the best available genetic data indicates that there are substantial genetic differences at least between the geographically separated Klamath River and San Pablo Bay populations of green sturgeon.

Sturgeon species exhibit fidelity to their spawning sites so they have a

general pattern of multiple DPSs. Sturgeon are known to have strong homing capabilities which leads to high spawning site fidelity (Bemis and Kynard, 1997). Because preliminary genetic data indicate that the Sacramento River population is different from the Klamath and Rogue River populations, and because sturgeon tend to exhibit high spawning site fidelity, NMFS has determined that the two green sturgeon populations are "discrete" as defined in the DPS policy.

**Significance:** The genetic information described above indicates that the northern and southern populations are "significant" as defined in the DPS policy. In addition to the genetic information, there is other information indicating that these DPSs are significant. First, each DPS occupies unusual or unique ecological settings for the species as a whole. This is evidenced by the fact that spawning populations of each DPS are found in separate and distinct Environmental Protection Agency ecoregions that have been identified based on soil content, topography, climate, potential vegetation, and land use (Omernik 1987). The geographic range of the northern DPS occurs largely within the Coastal Range ecoregion which extends from the Olympic Peninsula southward through the Coast Range and Klamath Mountains to the San Francisco Bay area. In contrast, the southern DPS occurs largely within the Central California Valley ecoregion which includes the Sacramento and San Joaquin Rivers. Second, the loss of either of these DPSs would result in a significant gap in the range of the species given the known distribution of spawning populations.

The identification of two DPSs and the geographic separation of the two DPSs at the Eel River should be considered provisional and subject to revision as more genetic and life history information is gathered on green sturgeon. Although NMFS believes that the green sturgeon is comprised of at least these two DPSs, additional DPSs may be delineated when more genetic and life history information is collected and analyzed. Similarly, the Eel River boundary between these two DPSs is based largely on geography and may be modified based on new information.

#### Status of Green Sturgeon DPSs

In assessing the status of the northern and southern DPSs, NMFS evaluated the available literature, information obtained in response to the 90-day finding request for information, and both qualitative and quantitative information provided by state and

Tribal co-managers from California, Oregon, and Washington. The quantitative information was primarily time series of harvest (catch and catch-per-unit-effort (CPUE)) data from fishery agencies in Oregon and Washington, and from Tribal fishery managers in the Klamath River basin.

#### Northern Green Sturgeon DPS

Information relevant to assessing the abundance and/or population trends of green sturgeon in this DPS is limited. The status review for green sturgeon examined fisheries harvest data from the Yurok tribal fishery in the Klamath River and the commercial sturgeon fishery in the Columbia River in an effort to assess trends in abundance over time and population status (NMFS 2002). The time series of catch and CPUE data for the Yurok tribal fishery was considered the most representative available population measure for green sturgeon in general and this DPS in particular because the data are based on a spawning population in the DPS rather than a summer concentration of non-spawning fish from a mixture of spawning populations such as is the case in the Columbia River. Both data series are fishery-dependent and suffer from problems associated with changing regulations and effort levels.

Catch and CPUE data are available for the Yurok tribal fishery for the period 1984–2001, and it is the data set least impacted by regulatory changes. A qualitative examination of the data suggests that catch has increased slightly over time and that CPUE is stable or has slightly decreased over time. However, these trends are not statistically significant. The length-frequency data of harvested green sturgeon was also examined to determine if there was any evidence that harvest was affecting the size structure of the population. Although the sample sizes were small, there was no evidence of any trend in the available data suggesting that larger fish were being removed from the population or that the size structure of the population has been altered by this or other fisheries.

The Columbia River commercial harvest data represents the longest available green sturgeon time series, but it is difficult to interpret since the harvest occurs on a summer concentration of non-spawning fish that are thought to originate from multiple spawning populations. Regulations were significantly modified in 1993, so the analysis of trends was only conducted on catch data from 1960–1992. Catch over this time period may have been affected not only by changes in regulations and effort but also by