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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 224

[Docket No. 120705210-3872-02]

RIN 0648-XC101

Endangered and Threatened Wildlife and Plants; 12-Month Finding and Proposed Endangered Listing of Five Species of Sturgeons under the Endangered Species Act

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

ACTION: Proposed rule; 12-month petition finding; request for comments.

SUMMARY: We, NMFS, have completed comprehensive status reviews under the Endangered Species Act (ESA) of five species of foreign sturgeons in response to a petition. We have determined, based on the best scientific and commercial data available and after taking into account efforts being made to protect the species, that Acipenser naccarii (Adriatic sturgeon), and A. sturio (European sturgeon) in Western Europe, A. sinensis (Chinese sturgeon) in the Yangtze River basin, and A. mikadoi (Sakhalin sturgeon) and Huso dauricus (Kaluga sturgeon) in the Amur River Basin/Sea of Japan/Sea of Okhotsk region, meet the definition of endangered species. We are not proposing to designate critical habitat because the geographical areas occupied by these species are entirely outside U.S. jurisdiction and we have not identified any unoccupied areas that are currently essential to the conservation of any of these species. We are soliciting information that may be relevant to these listing and critical habitat determinations,

especially on the status and conservation of these species.

DATES: Comments on this proposed rule must be received by [insert date 60 days after date of publication in the FEDERAL REGISTER]. Public hearing requests must be made by [insert date 45 days after publication in the FEDERAL REGISTER].

ADDRESSES: You may submit comments on this document, identified by NOAA-NMFS-2012-0142, by any of the following methods:

- Electronic Submissions: Submit all electronic public comments via the Federal eRulemaking Portal. Go to www.regulations.gov/#!docketDetail;D=NOAA-NMFS-2012-0142. click the "Comment Now" icon, complete the required fields, and enter or attach your comments.
- Fax: 301–713–4060; Attn: Dwayne Meadows.
- Mail: Submit written comments to Dwayne Meadows, NMFS Office of Protected Resources (F/PR3), 1315 East West Highway, Silver Spring, MD 20910, USA.

  Instructions: You must submit comments by one of the above methods to ensure that we receive, document, and consider them. Comments sent by any other method, to any other address or individual, or received after the end of the comment period may not be considered. All comments received are a part of the public record and will generally be posted for public viewing on http://www.regulations.gov without change. All personal identifying information (e.g., name, address, etc.), confidential business information, or otherwise sensitive information submitted voluntarily by the sender will be publicly accessible. We will accept anonymous comments (enter ''N/A'' in the required fields if you wish to remain anonymous). Attachments to electronic comments will be accepted in Microsoft Word, Excel, or Adobe PDF file formats only.

You can obtain the petition, the proposed rule, and the list of references electronically on our NMFS website at http://www.nmfs.noaa.gov/pr/.

FOR FURTHER INFORMATION CONTACT: Dr. Dwayne Meadows, NMFS, Office of Protected Resources, (301) 427-8403.

SUPPLEMENTARY INFORMATION:

Background

On March 12, 2012, we received a petition from the WildEarth Guardians and Friends of Animals to list 15 species of sturgeon (Acipenser naccarii – Adriatic sturgeon; A. sturio – European sturgeon; A. gueldenstaedtii – Russian sturgeon; A. nudiventris – ship sturgeon/bastard sturgeon/fringebarbel sturgeon/spiny sturgeon/thorn sturgeon; A. persicus – Persian sturgeon; A. stellatus – stellate sturgeon/star sturgeon; A. baerii – Siberian sturgeon; A. dabryanus – Yangtze sturgeon/Dabry's sturgeon/river sturgeon; A. sinensis – Chinese sturgeon; A. mikadoi – Sakhalin sturgeon; A. schrenckii – Amur sturgeon; Huso dauricus – Kaluga sturgeon; Pseudoscaphirhynchus fedtschenkoi – Syr-darya shovelnose sturgeon/Syr darya sturgeon; P. hermanni – dwarf sturgeon/Little Amu-darya shovelnose/little shovelnose sturgeon/Small Amu-dar shovelnose sturgeon; P. kaufmanni – false shovelnose sturgeon/Amu darya shovelnose sturgeon/Amu darya sturgeon/big Amu darya shovelnose/large Amu-dar shovelnose sturgeon/shovelfish) as threatened or endangered under the Endangered Species Act (ESA). As a result of subsequent discussions between us and the U.S. Fish and Wildlife Service (FWS), we have determined that 10 of the 15 petitioned sturgeon species are not marine or anadromous and thus not within our jurisdiction; therefore, those 10 species are the responsibility of the FWS, which will conduct the required listing analyses. We did determine that Acipenser naccarii, A. sturio, A. sinensis, A. mikadoi and Huso dauricus are within our jurisdiction. On August 27, 2012, we published a 90-day finding in the Federal Register (77 FR 51767) that found that listing these five species under the ESA may be warranted, and announced the initiation of status reviews for each species.

We are responsible for determining whether species are threatened or endangered under the ESA (16 U.S.C. 1531 et seq.). To make this determination, we first consider whether a group of organisms constitutes a "species" under the ESA, then whether the status of the species qualifies it for listing as either threatened or endangered. Section 3 of the ESA defines a "species" as "any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature." Section 3 of the ESA further defines an endangered species as "any species which is in danger of extinction throughout all or a significant portion of its range" and a threatened species as one "which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." We interpret an "endangered species" to be one that is presently in danger of extinction. A "threatened species," on the other hand, is not presently in danger of extinction, but is likely to become so in the foreseeable future (that is, at a later time). In other words, the primary statutory difference between a threatened and endangered species is the timing of when a species may be in danger of extinction, either presently (endangered) or in the foreseeable future (threatened). Section 4(a)(1) of the ESA requires us to determine whether any species is endangered or threatened due to any one or a combination of the following five threat factors: (1) The present or threatened destruction, modification, or curtailment of its habitat or range; (2)

overutilization for commercial, recreational, scientific, or educational purposes; (3) disease or predation; (4) the inadequacy of existing regulatory mechanisms; or (5) other natural or manmade factors affecting its continued existence. We are required to make listing determinations based solely on the best scientific and commercial data available after conducting a review of the species' status and after taking into account efforts being made by any state or foreign nation to protect the species.

In making listing determinations for these five species, we first determine whether each petitioned species meets the ESA definition of a "species." Next, using the best available information gathered during the status reviews, we complete an extinction risk assessment. We then assess the threats affecting the status of each species using the five listing factors identified in section 4(a)(1) of the ESA.

Once we have determined the threats, we assess efforts being made to protect the species to determine if these conservation efforts are adequate to mitigate the existing threats. We evaluate conservation efforts using the criteria outlined in the joint NMFS/FWS Policy for Evaluating Conservation Efforts (PECE; 68 FR 15100; March 28, 2003) to determine their certainty of implementation and effectiveness for future or not yet fully implemented conservation efforts. Finally, we re-assess the extinction risk of each species in light of the existing conservation efforts.

Status Reviews

In order to complete the status reviews, we compiled information on the species biology, ecology, life history, threats, and conservation status from information contained in the petition, our files, a comprehensive literature search, and consultation with known experts. This information is available in a status review report available on our website (see ADDRESSES section). In the rest of this section we summarize information from that report.

Sturgeon General Species Description

Sturgeons are bony fishes most closely related to paddlefishes and bichirs. They all have cartilaginous skeletons, heterocercal caudal fins (upper lobe is larger than the lower lobe), one spiracle respiratory opening (like sharks), and unique ganoid scales. In sturgeons, these ganoid scales remain only as the five rows of bony “scutes” on the sides of the body. They all have a bottom-oriented mouth with four barbels (sensory “whiskers”), a flat snout and strong rounded body. Sturgeons have an electrosensory system similar to that in sharks, which they use for feeding. All of these species seasonally migrate into rivers to spawn. They are mostly bottom-oriented feeders that are normally generalist predators on benthic prey, including various invertebrates and fishes, except H. dauricus, which is more piscivorous. The following section describes specific aspects of the biology and ecology of the five petitioned species. Information on many of the species is quite sparse so we cannot provide complete descriptions of the species' natural history. More details can be found in Meadows and Coll (2013).

Natural History of the Adriatic sturgeon (Acipenser naccarii)

Taxonomy and Distinctive Characteristics

Acipenser naccarii has a moderate-length snout that is very broad and rounded at the tip. It has an interrupted lower lip at the center of the mouth and its barbels are short. The species has an olivaceous brown back with lighter flanks and a white belly. Morphological differences in scutes and the skull bones help distinguish A. naccarii from the similar A. sturio and Atlantic sturgeon, A. oxyrinchus, which can overlap in parts of their range.

Range and Habitat Use

Historically, A. naccarii was known to occur in the Adriatic Sea ranging from lagoons in Venice, Italy, to the coastlines and rivers of Greece (Arlati et al., 2011). It occurred in large rivers over muddy or sandy bottoms (Arlati et al., 2011). Historical records of the species exist in the rivers Adige, Brenta, Bacchiglione, Livenza, Piave, Tagliamento, and Po (including the Po delta); north to Turin; at Carignano and Carmagnola; in the Ticino and Adda rivers; along the Albanian coasts; and in Croatia, Bosnia-Herzegovina, and Montenegro. The species was last recorded from Albania in 1997 in the Buna River (Arlati et al., 2011). It was reintroduced to Greece on one occasion (Paschos et al., 2003), but there is no evidence that it has established a viable population (Paschos et al., 2008). Recent research on ancient specimens suggests the species may have existed in the past and up to the 1980s in the Iberian Peninsula, though this hypothesis has been contested (Meadows and Coll, 2013). There is a landlocked population in the Ticino River above the Isola Serafini dam at the confluence of the Po and Adda rivers. Adaptation of young-of-the-year to brackish and marine waters is poor (McKenzie et al., 2001). The only remaining spawning sites recently in use are at the confluences of the Po River and its tributaries (Adda, Ticino, etc.), and these sites have dwindled to an area of occupancy of less than 10 km^2 (Arlati et al., 2011).

Reproduction, Feeding, and Growth

Acipenser naccarii spawns in freshwater after a marine period of growth during which it remains near the shore (at the mouths of the rivers) at depths of 10 to 40 meters (Arlati et al., 2011). It does not enter pure marine waters. Between February and May, A. naccarii ascends rivers to spawn and reproduction occurs between February and July in low current along the river bank. Their lifespan is about 50 years. Adults usually grow to 150 centimeters with a maximum length of 200 centimeters and weigh between 20 and 25 kilograms. Feeding preference is for worms. Little else is known about their life history or life cycle.

Distribution and Abundance

Acipenser naccarii is thought to have declined by at least 80 percent over the past 3 generations (Arlati et al., 2011). During the last few decades, the abundance of A. naccarii has dramatically decreased as reflected by the annual catches of 2-3 metric tons per year in the beginning of the 1970s with only 200 kg per year of catches from 1990-1992, with no decrease in demand. In 1993, only 19 specimens were caught (Bronzi et al., 1994). There is no longer any legal commercial fishery. The last known natural wild spawning in Italy occurred in the early 1980s (Arlati et al., 2011). Only a few fish have been caught recently, and they probably originated from stocked population releases (Arlati et al., 2011).

The species has been reintroduced in Italy through a stocking program in rivers in the north central Lombardy region since 1991, and in the rivers of the northeast Veneto region since 1999 (Arlati and Poliakova, 2009). From June 1988 through April 2007, 438,633 fish were restocked. At present, the remaining captive parents from the wild stock constitute the only living Adriatic sturgeons of unequivocal wild origin left (Congiu et al., 2011). Evidence to confirm reproduction in the wild of these stocked fish remains lacking (Arlati et al., 2011).

Population Structure

A genetic comparison between Italian and Albanian samples collected in the mid-20th century showed a high level of diversification and suggested that different populations should be considered as distinct conservation units (Ludwig et al., 2003). There is no other information on population biology or geographical patterns in morphology, ecology, or biology with which to draw conclusions or make inferences about population or DPS structure.

Natural History of the European Sturgeon (Acipenser sturio)

Taxonomy and Distinctive Characteristics

Acipenser sturio is a large species that can reach 5 to 6 meters (~16.5 to 20 feet) in length and weigh up to 1000 kilograms (2,200 pounds). The species has an elongated body with a narrow-tipped snout and a mouth that is interrupted at the center of the lower lip. It has an olive-black upper body and a white belly. Recent mitochondrial DNA (mtDNA) evidence suggests A. sturio and A. oxyrinchus occurred in sympatry in the Baltic Sea and that A. oxyrinchus dominated A. sturio and replaced it about 800-1,200 years ago (Ludwig et al., 2002). Stankovic (2011) extended this work to show that the dominant species in the area of the Oder and Vistula River systems has been A. oxyrinchus since at least the third century B.C. Both A. sturio and A. oxyrinchus were present in France from 3000 years B.C. (Desse-Berset, 2009; Desse-Berset and Williot, 2011; Desse-Berset, 2011). Acipenser oxyrinchus was present in several archaeological sites on the French Atlantic coast until the second century A.D., in the Loire River in the 11th century A.D., in the Seine River drainage between the 2nd century B.C. and first half of the 17th century A.D., as well as in the Scarpe River flowing into the Scheldt River (France, Belgium and the Netherlands) between the 10th and 11th century A.D (Desse-Berset and Williot, 2011). Tiedemann et al. (2007) however provide evidence of genetic introgression of A. oxyrinchus females and A. sturio males (which Gessner (personal communication) claims to be outdated and erroneous due to methodology). Thus the historical presence of these species in this region is complex and some old records and studies may have misidentified species. Analyses of the genetics of historical museum specimens provide evidence of a decline in genetic diversity in A. sturio since 1823 (Ludwig et al., 2000).

Range and Habitat Use

Acipenser sturio was historically abundant in the North Sea, the English Channel, and most European coasts of the Atlantic Ocean, the Mediterranean Sea and the Black Sea (Freyhoff et al., 2010) with an almost pan-European distribution across river systems. It is the only verified native sturgeon on the Iberian Peninsula (Almaca and Elvira, 2000; Ludwig et al., 2009). Currently, it is restricted to a small population that breeds in the Gironde system (consisting of the Gironde estuary, and the Dordogne and Garonne rivers) in southwestern France and the remnants of a population that last reproduced in the Rioni basin in Georgia in 1991 (Meadows and Coll, 2013).

Juvenile A. sturio in the Gironde estuary prefer habitat where important prey items such as tube-dwelling polychaetes exist in large numbers. Juveniles exhibit movements mainly oriented to follow the direction of the tidal current and never use intertidal areas. Information on adult habitat preferences in lower estuaries and the ocean is sparse and qualitative. It appears the species is found close to shore in the sea and is never found in waters deeper than 100-200 meters (Meadows and Coll, 2013).

Reproduction, Feeding and Growth

Acipenser sturio has probably the most detailed information on reproductive biology of the five petitioned species under NMFS' jurisdiction. They can tolerate a wide range of salinities and spend most of their life in salt water (close to the coast), but migrate to spawn in fresh waters. Juveniles can be found both in estuaries and in the sea. The reproductive phase begins later than in many other sturgeons, with males reproducing for the first time at 10 to 12 years and females at 14 to 18 years (Freyhoff et al., 2010), with ranges in the literature of 7 to 15 for males and 8 to 22 for females (Williot et al., 2011b). Maturity is reached at an earlier age in southern parts of the species' range (Williot et al., 2011b). They reach sexual maturity between 10 and 12 years in males and between 13 and 16 years in females in the Gironde system (Williot et al., 1997). Size at maturity varies from 90-130 cm total length (TL) in males and 95-185 cm TL in females (Williot et al., 2011b). Reproduction likely occurs between March and July (depending on location) at 2-year intervals for males and 3 to 4 year intervals for females (Meadows and Coll, 2013). Spawning migration of 1000 kilometers (620 miles) or more are reached during high-water years. Females produce 800,000 to 2,400,000 sticky, dark eggs during a spawning period, with egg-laying usually done at a depth of 2 to 10 meters in large rivers or estuaries that have gravel bottoms, to which the eggs adhere. Eggs hatch in 3-14 days at temperatures of 7.7 to 20°C (Rosenthal et al., 2007). Fish make the transition to the juvenile stage after about 1 month (Acolas et al., 2011b). Juveniles make a slow descent downstream to the estuary and are present in the upper estuary of their birth rivers at 1 year of age, where they appear to congregate in areas of high food density. They feed on crustaceans, mollusks, and especially worms; juveniles also feed on small fish (Brosse et al., 2000; Brosse et al., 2011). Juveniles enter the sea after a 2- to 6-year period during which they alternate movement between the sea and spending the winter in the estuary. For the next 4 to 6 years, they leave the sea to enter the lower estuary at summer time, and return to the sea in the fall.

Distribution and Abundance

Acipenser sturio is thought to have declined by at least 90 percent over the past 75 years

(Freyhoff et al., 2010). It was an important commercial species until the early 20th century, but no natural reproduction has been documented in the wild since 1994 (in southwest France, Freyhoff et al., 2010). For the Weichsel or Vistula River in Germany, archaeological remains from the first millennium indicate that up to 70 percent of the protein consumed by humans derived from sturgeon (Kirschbaum and Gessner, 2000). The last specimen from German waters was caught in 1992 (Gessner et al., 2011). Quantitative data document the decline in catch in the lower Elbe and Rhine rivers in Germany from the late 1800s to 1918, when the species was commercially extirpated (Meadows and Coll, 2013). The species was extirpated in Belgium by 1840 (Rosenthal et al., 2007). It was likely extirpated in the Tagus River in Spain by the Middle Ages (Ludwig et al., 2011). In Italy, it was historically the most common sturgeon in the Po River, until declining from the late 1800s to the 1950s after dam construction and other threats increased, with complete extirpation by 1987 (Bronzi et al., 2011b). A decline in the Tiber River in Italy led to extirpation by the 1920s (Bronzi et al., 2011b)

The only known potential spawning population remaining is in the Gironde system of southwestern France, but the last wild reproduction events occurred there in 1988 and 1994 (Williot et al., 1997). Genetic data strongly suggest that the cohort of 1994 derives from only one mating pair (Ludwig et al., 2004). Between 1951 and 1980, catches of sturgeon in the Gironde system dropped by 94 percent, from 2,500 fish per decade to only 150 (Rosenthal et al., 2007; Castelnaud, 2011). The current population size is roughly estimated at approximately 20 to 750 adults (Rosenthal et al. 2007, Freyhoff et al., 2010) or 500 to 1,500 individuals (Kirschbaum et al., 2009). Age structure of the population in the Gironde shifted significantly to smaller, younger individuals between 1985 and 1992 (Meadows and Coll, 2013). Large numbers have been stocked from hatchery programs in the past few years (7,000 in 2007, 80,000 in 2008, and 46,000 in 2009) (Freyhoff et al., 2010). The first-generation of stocked fish (the 2007 population) is expected to start reproducing in 2014 (Freyhoff et al., 2010). The survival rate of these recent releases is currently unknown; however, the survival rate for a previous restocking effort in 1995 was 3 to 5 percent (Rochard et al., 1997). A population viability analysis (PVA) model was recently completed for the Gironde system population. The most influential parameters affecting the model output were the mean number of offspring, egg-to-age-1 natural mortality, sex ratio, and the age at which females reach maturity (Jarić et al., 2011). The PVA did not estimate extinction risk. The model did confirm the population has a high susceptibility to unsustainable fishing, and a slow recovery potential, with recovery potentially spanning a number of decades (Jarić et al., 2011).

The only other place where adult sturgeon may occur is in the Rioni River system in Georgia (Kolman, 2011). This system has never had a population size estimate survey conducted (Kolman, 2011). Overfishing, pollution, and habitat destruction (dam construction on the spawning site) are all cited as causes of their decline in the system (Kolman, 2011). The last documented reproduction there was in 1991 (Rosenthal et al., 2007), though a few individual fish of 1.2 to 1.75 m length were occasionally caught between 2002 and 2008 (Kolman, 2011). It was listed as endangered in the Georgian Red Book of Endangered Species in 1967 (Kolman, 2011).

Population Structure

Debus (1999) found some differences in the bony plates of A. sturio from the Gironde system and the Rioni River, but concluded that only one species is present in European waters.

Other studies considered evidence of intra- and interspecific genetic variation, and some have suggested subspecies exist, but the current consensus is that there is not enough evidence to support distinct subspecies of A. sturio (Holcik et al., 1989; Ludwig et al., 2000). Similarly, there is morphological variability that has led some to suggest a Baltic subspecies (Artyukhin and Vecsei, 1999), but these suggestions have also not been widely accepted by the scientific community. Holcik (2000) discusses the possible occurrence of 9 to 12 historical populations, and Elivra and Almodovar (2000) studied morphometric and meristic variation and found some evidence of four populations. There is no other information on population biology or geographical patterns in morphology, ecology, or biology with which to draw conclusions or make inferences about population or DPS structure in this species. Based on the above, and the limited current distribution of the species, we conclude that no subspecies or DPS designations are warranted.

Natural History of the Chinese Sturgeon (Acipenser sinensis)

Taxonomy and Distinctive Characteristics

Acipenser sinensis is a large species reaching up to 5 meters (16.4 feet) in length and weighing up to 450 kilograms (~992 pounds). The species has gray-black coloring on its back, red-brown or gray coloring on its sides, and a white belly.

Range and Habitat Use

Historically, A. sinensis is native to the northwest Pacific Ocean in China, Japan, North Korea, and South Korea (Wei, 2010a). In China, the species historically occurred in the Yellow, Yangtze, Pearl, Mingjiang and Qingtang rivers, but it is now extirpated from all of these rivers except for the middle and lower reaches of the Yangtze (Wei, 2010a). At sea, A. sinensis occurs close to the shores of the Yellow and East China seas. Wang et al. (2012) report on acoustic tagging that showed spawning migrations of Chinese sturgeon occurred between June and October in the remaining accessible parts of the Yangtze River. They showed that females left the spawning ground within hours, but males remained for anywhere from 2.5 to 148 days.

Reproduction, Feeding and Growth

Acipenser sinensis juveniles live in estuaries and near coastlines and migrate upriver when they become sexually mature (Wei, 2010a). Males reach sexual maturity at 8 to 18 years of age and females at 13 to 28 years of age (Wei et al., 1997). Maximum age of reproduction is 35. Adults reach the mouth of the Yangtze River between June and July and reach the middle of the river in September or October, where they then spawn and overwinter (Wei et al., 1997; Wei, 2010a). Spawning usually occurs at night in October or November at water temperatures of 15 to 20 °C in substrates the size of coarse gravel to 20-50 cm boulders at depths of 8 to 26m in current velocities near 1m/s (Meadows and Coll, 2013). The larvae hatch after 4 to 6 days at 16.5 to 18 °C and juveniles remain in the river for a year before migrating to the sea. Before the Gezhouba Dam was constructed on the Yangtze River in 1981, the migration distance for A. sinensis was as long as 2,500 to 3,300 kilometers (Wei et al., 1997, Wei, 2010a). The Three Gorges Dam was completed in 2003 upstream of the Gezhouba dam, but affects the downstream water conditions and hydrograph. Considerable hydrodynamic modeling and testing has been done to determine the effects of altered flows due to the dams on the species' biology (reviewed in Wang et al., 2012). Now there is just one remaining spawning ground, which is situated just below the Gezhouba Dam. Juveniles 7 to 38 cm TL occur in the Yangtze River estuary from the middle of April through early October (Wei et al., 1997). Acipenser sinensis feed on aquatic insect larvae, shrimps, crustaceans, and fishes. The female/male sex ratio has changed from 0.79 in 1981–1993 to 5.9 in 2003–2004, the motility of sperm has decreased, and intersex individuals have been observed (Meadows and Coll, 2013).

Distribution and Abundance

The population size of A. sinensis is decreasing with an estimated 97.5 percent decline in the spawning population over a 37-year period, from ~100,000 in the 1970s to ~2,200 individuals (95 percent confidence interval of 946 to 4,169) in the early 1980s (Wei, 2010a). The species was a major commercial fishery resource in the 1960s, but by the end of the 1970s yearly catch had declined to 500 fish (Wei, 2010a). Recent surveys between 2005 and 2007 show the total spawning population to be 203-257 individuals (Wei, 2010a; Xiao and Duan, 2011). The estimated numbers of eggs spawned annually sharply declined between 1997 and 2003; the estimates were 35.5 million in 1997, 2.2 million in 2003, and about 2 million per year between 2006 and 2008 (Xiao and Duan, 2011). Between 1983 and 2007, more than 9 million hatchery raised juveniles (including larvae) were released into the Yangtze River to increase population numbers, but the contribution of these releases to wild stocks is considered to be less than 10 percent (Yang et al., 2005; Wei, 2010a).

In the Pearl River, the two spawning areas stopped being used in the late 1970s as a result of the stock decline (Zhang, 1987). A study sampling fish larvae from 2006 through 2008 failed to collect any Chinese sturgeon larvae among the 614,000 fish larvae collected (Tan et al., 2010). Liao et al. (1989) also document the lack of the species in the Pearl River.

Gao et al. (2009) conducted a VORTEX PVA model to estimate the sustainability of the population and to quantify the efficiency of current and proposed conservation procedures. The most likely models predicted the observed decline of Chinese sturgeon resulting from the effect of the Gezhouba Dam and also predicted future declines for the species. The model simulations also demonstrated that the current restocking program is not sufficient to sustain or improve the status of this species, as the capture and handling mortality of the artificial reproduction program induces the loss of more wild mature adults than the recruitment expected by the artificial reproduction. Thus stocking programs intended to help the species can have a net negative effect.

Population Structure

Besides uncertainty about the taxonomic status of the Pearl and Chinese River populations (Billard and Lecointre, 2001), there is no information on population biology or geographical patterns in morphology, ecology, or biology with which to draw conclusions or make inferences about DPS structure in this species.

Natural History of the Sakhalin Sturgeon (Acipenser mikadoi)

Taxonomy and Distinctive Characteristics

Acipenser mikadoi, like A. naccarii has a lower lip that is split down the middle and four barbels that are nearer to the mouth than the tip of its snout. They can grow up to 2.5 meters (8.2 feet) in length and weigh up to 150 kilograms (~330 pounds). It has olive to dark green coloring on its back and a yellowish green-white belly, with an olive-green stripe on its side between the lateral and ventral scutes. Its separation from North American green sturgeon, A. medirostris, was recently reaffirmed by Vasil'eva et al. (2009).

Range and Habitat Use

Historically, A. mikadoi is native to the northwest Pacific Ocean in Japan and Russia, with an uncertain presence in China, South Korea, and North Korea (Meadows and Coll, 2013). During spawning migration, the species historically ascended Russian coastal rivers (the Suchan, Adzemi, Koppi, Tumnin, Viakhtu, and Tym Rivers) and the Ishikari and Teshio Rivers of Japan (Shmigirlov et al., 2007; Mugue, 2010). It was also known from the mouths of small rivers of the Asian Far East and Korean Peninsula, as well as the Amur River, and rivers of the Sakhalin Island (Meadows and Coll, 2013). Currently, it is found throughout the Sea of Okhotsk, in the Sea of Japan as far east as the eastern shore of Hokkaido (Japan), along the Asian coast as far south as Wonsan (North Korea), and to the Bering Strait on the coast of the Kamchatka Peninsula (Shmigirlov et al., 2007; Mugue, 2010). It spawns persistently only in the Tumnin River in the Khabarovsk Region in Russia (Shmigirlov et al., 2007), though at least one mature female was caught in Bay Viyakhtu near the settlement of Trambus in the summer of 2010, and a mature male was caught in the Viyakhtu River in 2011 (Koshelev et al., 2012).

Reproduction, Feeding and Growth

Acipenser mikadoi lives in higher salinity waters than other sturgeon within its range. It has an estimated generation length of 15 years and reaches maturity between 8 to 10 years of age. They spawn in June through July in the Tumnin River, and in April and May in the rivers of Hokkaido, Japan (Mugue, 2010), with migration occurring once individuals reach 135cm total length (Koshelev et al., 2012). Spawning occurs at water temperatures of 7.2 to 11.5 °C ,and juveniles migrate to the sea in the fall of the same year they hatched (Birstein, 1993). Estuaries are thought to be the nursery grounds for the species (Paul, 2007a). The species feeds mainly on shrimp, crabs, worms, amphipods, isopods, sand lances, and other fishes.

Distribution and Abundance

The population size of A. mikadoi is decreasing and has been declining over the past century (Mugue, 2010). Anecdotal reports note that the species "was common in the fish markets of Japan in the 1950s and now only a few specimens are found per year" (Mugue, 2010). Erickson (2005) summarizes status information on the species in the Tumnin River until 2003. The most recent population estimates range from 10 to 30 adults entering the Tumnin River to spawn annually, with only three specimens caught in 2005, and two in 2008. These few specimens were used to establish aquaculture stocks (Mugue, 2010). Koshelev et al. (2012) report catches of 17 individuals in the Tumnin River and Datta Bay from 2006-2008. Recent seine fish surveys in the Tumnin River during the past 2 years have not caught this species (Zolotukhin, 2012). Five to 10 Sakhalin sturgeon are caught annually in the Amur River estuary where they were introduced (Krythkin and Svirskii, 1997c). The species is now listed as extinct in the Hokkaido Red Data Book in Japan (Omoto et al., 2004).

Population Structure

Spawning is earlier in the rivers of Hokkaido than the Tumnin River, but it is unknown if this is simply an effect of environmental conditions or reflects underlying population structure. There is no other information on population biology or geographical patterns in morphology, ecology, or biology with which to draw conclusions or make inferences about population or DPS structure in this species.

Natural History of the Kaluga Sturgeon (Huso dauricus)

Taxonomy and Distinctive Characteristics

Huso dauricus is one of the world's largest freshwater fishes, with mature individuals exceeding 5.6 meters in length (~18.4 feet) and 1 ton in weight. It has a crescent-shaped mouth with flat barbels. The species has gray-green to black coloring on its back and a yellowish green-white belly. This species is more piscivorous than the other sturgeons considered herein, and as a result, it has the ability to project its jaws further in front of its mouth to help catch prey.

Range and Habitat Use

Huso dauricus historically inhabited the lower two-thirds of the Amur River of Russia and China from its estuary to its uppermost sections and tributaries, including the Shilka, Onon, Argun, Nerch, Sungari, Nonni, Ussuri, and Neijian rivers (Ruban and Wei, 2010). It inhabited all types of benthic habitats in the large river and lakes of the Amur River basin (Ruban and Wei, 2010). All we know of current marine range is that young individuals appear in the Sea of Okhotsk and the Sea of Japan.

Reproduction, Feeding and Growth

Huso dauricus is a semi-anadromous species, spending some of its life in salt water but most of its life in freshwater (Ruban and Wei, 2010). Young enter the Sea of Okhotsk during the summer. The species has a generation length of 20 or more years and a spawning interval of 4 to 5 years for females and 3 to 4 years for males (Ruban and Wei, 2010). Females mature at 14 to 23 years of age and males mature at 14 to 21 years of age (Meadows and Coll, 2013). Spawning occurs from May through July at water temperatures of 12 – 20 °C, over pebble deposits in calm waters of the main riverbed in depths of 2-3m (Wei et al., 1997, Billard and Lecointre, 2001). Spawning is documented from many sites, but not the Songhuajiang and Wusulijiang rivers (Wei et al., 1997). Fecundity is from 3,200 to 15,000 eggs/kg body weight and has declined over time (Meadows and Coll, 2013). Downstream migration begins almost immediately after hatching. Kaluga consume mostly invertebrates in the first year of life, later becoming more predatory and less bottom oriented than most other sturgeon, switching to juveniles of pelagic fishes such as chum salmon, Oncorhynchus keta (Krykhtin and Svirskii, 1997c). At the age of 3 to 4 years, Kaluga start to feed on adult fishes. Cannibalism is common. Kaluga do not feed during winter.

Distribution and Abundance

Huso dauricus has declined sharply in both stock size and recruitment since the 19th century, with an 80 percent decline in population from the late 1800s to 1992 (Ruban and Wei, 2010). Official catch records in the Russian Federation and the former USSR dropped from 595 tons in 1881 to 61 tons in 1948, and were 89 tons in 1996 (CITES, 2000). Between 1993 and 1997, meat of H. dauricus was still observed for sale in many parts of Russia (CITES, 2000). Official records in China indicate that the combined annual catches of A. schrenckii and H. dauricus have fluctuated inconsistently since the 1950s (CITES, 2000). In the last 15 years the species has continued to decline and the average age is decreasing as well (Ruban and Wei, 2010).

Population Structure

There are four recognized populations of H. dauricus: one in the estuary and coastal brackish waters of the Sea of Okhotsk and Sea of Japan, the second in the lower Amur, the third in the middle Amur, and the fourth in the lower reaches of the Zeya and Bureya rivers (Krykhtin and Svirskii, 1997a; 1997b; 1997c). At the end of the 19th century, when the highest catches were recorded (more than 595 metric tons per annum), the largest population was that of the middle Amur, which constituted 87 percent of the total annual Kaluga catch on the Russian side, while the estuary and lower Amur populations accounted for no more than 2 percent each, and the Zeya-Bureya population constituted around 11 percent of the species' catch (Krykhtin and Svirskii, 1997b).

The estuary population is divided into freshwater and saltwater morphs; 75-80 percent are the freshwater morph and the remainder are the saltwater morph (Krykhtin and Svirskii, 1997c). The latter winters in the freshwater zone, and migrates to the brackish water of the delta in the northern part of the Tatar Strait and the south-western part of the Sakhalin Gulf for feeding in June and July. They return to the freshwater zone in autumn when the salinity increases. For spawning, most of the saltwater morph migrates in winter to grounds up to 500 km from the river mouth, while other morphs enter the mid-Amur River. However, the freshwater non-migratory stock has not been assigned a separate population status as both stocks spawn on the same spawning grounds in the lower Amur River (Schmigirlov et al., 2007).

Current populations consist predominantly of young fish, with mature fish accounting for only 2-3 percent of the population (Krykhtin and Svirskii, 1997b). As a result of the species' late maturation and generally low reproductive rate, the population decline is expected to continue, especially in the middle Amur. Since 2000, Kaluga older than 10 years have not been observed in the Amur River channel during nonspawning periods, suggesting that adults from the resident stocks in the Amur River are absent (Schmigirlov et al., 2007). In 2007, China received approval for caviar export quotas of 1,595 kg for wild-caught H. dauricus from the Amur River. However, this quota could not be filled because the sturgeon population in the Amur River declined drastically, and the resource is considered to be exhausted (Li et al., 2009). No more recent population assessment data are available.

Species Determinations

Based on the best available scientific and commercial information described above, we have determined that Acipenser naccarii, A. sturio, A. sinensis, A. mikadoi and Huso dauricus are taxonomically-distinct species and therefore meet the definition of "species" pursuant to section 3 of the ESA and are eligible for listing under the ESA. Based on the information discussed above in the "Population Structure" section we determine there is insufficient information to identify DPSs of A. naccarii, A. sinensis and A. mikadoi. Based on the extinction risk status determined for A. sturio and H. dauricus discussed below, we determine that designating DPSs for these species is not warranted.

Extinction Risk

We next consider the risk of extinction for Acipenser naccarii, A. sturio, A. sinensis, A. mikadoi and Huso dauricus to determine whether the species are threatened or endangered per the ESA definition discussed above. As part of the status review, a three-person team of biologists evaluated the extinction risk of each species. They used a modification of the methods developed by Wainwright and Kope (1999) and McElhany et al. (2000) to organize and summarize their findings. This approach has been used in the ESA review of many other species (Pacific salmonid, Pacific hake, walleye pollock, Pacific cod, Puget Sound rockfishes, Pacific herring, and black abalone) to summarize the status of the species according to demographic risk criteria. Using these concepts, the team members individually estimated the extinction risk for each of the five species at both the current time and anticipated extinction risk expected in the foreseeable future based on the information in the report. They voted on the likelihood of extinction in 10 percent probability increments, with each member allocating 10 votes among the possible risk categories. They also performed a threats assessment by identifying the severity of threats that exist now and in the foreseeable future, organized around the five Section 4(a)(1) threat factors and their interaction as described in our regulations at 50 CFR 424.11(c). They defined the "foreseeable future" as the timeframe over which threats, or the species' response to those threats, can be reliably predicted to impact the biological status of the species.

The extinction risk analysis team found all five species to be at high risk of extinction in the present, with median votes for each team member at or above 80 percent probability of being currently in danger of extinction for each species. After reviewing the best available scientific data and the extinction risk evaluation on the five species of sturgeon, we concur with the findings of the extinction risk analysis team and conclude that the risk of extinction for all five species of sturgeon is currently high.

Summary of Factors Affecting the Five Species of Sturgeon

Next we consider whether any one or a combination of the five threat factors specified in section 4(a)(1) of the ESA are contributing to the extinction risk of these five sturgeons. The extinction risk analysis team voted in a similar fashion for each of the five threat factors and their interaction as they did for overall extinction risk discussed above. We concur with their assessment. We discuss each of the five factors and their interaction in turn below, with species-specific information following a general discussion. More species-specific details are available in Meadows and Coll (2013).

<u>The Present or Threatened Destruction, Modification, or Curtailment of its Habitat or Range</u>

We identified habitat destruction, modification, or curtailment of habitat or range as a potential threat to all five species of sturgeons and determine that this factor is currently contributing significantly to the risk of extinction most significantly for <u>A. naccarii</u>, <u>A. sturio</u>, and A. sinensis (Meadows and Coll, 2013). Dams, dikes and channels, pollution and poor water quality, and range loss are threats to all of the petitioned species to varying degrees.

The hydropower dam built in the 1950s on the Po River, Italy (Isola Serafini's Dam), and water pollution particularly affect the last stronghold of A. naccarii (Bronzi et al., 1994, Arlati et al., 2011). The Isola Serafini dam is at the mid-point of the Po River and has fragmented the population and blocked migration to some spawning grounds (Bronzi et al., 2006).

Dams are a particularly significant factor in the decline and range contraction of A. sturio (Meadows and Coll, 2013). Water pumping and dredging have also been identified as habitat threats (Williot et al., 2002a). Gessner (2000) provides a graphical representation of the timeline and relative intensity of river habitat alterations for the past 1,000 years. Untreated sewage is an additional cause of the decline in the Elbe River in Germany and throughout Europe since the onset of industrial development (Gessner, 2000; Gessner et al., 2011). Williot and Castelnaud (2011) summarize the history of habitat-altering dams and mines in France. Extraction of gravel in the Garonne River was a threat to the species (most has now stopped but the damage remains) as is water pollution and dams (Williot et al., 1997, Lepage et al., 2000, Rosenthal et al., 2007, Freyhoff et al., 2010). A dam, water pollution and gravel extraction are all implicated in the extirpation in the Guadalquivir River in Spain (Elvira et al., 1991; Fernandez-Pasquier, 1999; Ludwig et al., 2011).

The construction of the Gezhouba Dam limits the distribution of A. sinensis in the Yangtze River (Zenglong, 1998; Wei, 2010a) and affects recruitment and reproductive development (Wei et al., 1997). Historically, the spawning habitats of Chinese sturgeon were located in the main stream of the upper Yangtze and the lower Jinsha rivers, covering a stretch of about 800 km of river length. However, after the damming their spawning areas were limited to a 30 km reach below the Gezhouba Dam (Wei et al., 1997), with only two favorable sites being established below the dam (Ban et al., 2011). The completion of the Three Gorges Dam upstream of the Gezhouba dam in 2003 has further impacted the species by lowering the water level of the Yangtze River in fall and winter and affecting the water temperature and other stream characteristics (Wei, 2010a; Xiao and Duan, 2011). Three Gorges Dam, the world's largest, and only fully operational in 2010, also reduces the average discharge of the Yangtze by 40 percent, and this is expected to seriously affect the remaining spawning habitat into the future. The dams have a serious effect on spawning (Meadows and Coll, 2013). A proposed hydroelectric project on the Pearl River, the Changzhou Dam, will block spawning migrations in that system (Wei et al. 1997). Water pollution is also a problem for the species, especially in the Yangtze River, as much untreated wastewater discharges into the river each year (Xue et al., 2008). Water quality is also affected by runoff caused by deforestation of the upper Yangtze Valley (Wei, 2010b). Serious morphological malformation and impairment of reproduction from poor water quality has been documented in the system and is likely due to the chemical triphenyltin (TPT) which, along with its chemical precursors, is used as a pesticide and antifouling paint ingredient (Hu et al., 2009). Perfluorinated compounds are also at a level that may impact reproduction (Peng et al., 2010). Research by Zhang et al. (2011) found that all five species of Chinese sturgeon prey examined in their study were contaminated by heavy metals.

Pollution from agriculture, oil production, and mining is degrading habitat quality for A. mikadoi (Shilin, 1995; Mugue, 2010). Logging also occurs along the Tumnin River (Erickson, 2005). Damming of the Tumnin River is under discussion; this would massively affect the reproduction of this species (Gessner, personal communication).

In contrast to most large rivers, the Amur River, the core of the range of H. dauricus, has not been dammed; however, dams are being planned in the main tributaries and in the middle reaches (Gessner, personal communication). Water pollution (including heavy metals, oil products, phenol, mineral fertilizers and gold mining byproducts) in the Amur River system has increased in recent years from both the Russian and Chinese sides (Matthieson, 1993; Krykhtin and Svirskii, 1997b). Studies of the effects of pollution on this species have apparently not been undertaken, so it is unclear the extent to which this increased pollution could limit recovery of the species.

Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

We identified overutilization for commercial, recreational, scientific, or educational purposes as a potential threat to all five species of sturgeons and determine that this factor is currently contributing significantly to the risk of extinction for A. naccarii, A. sturio, A. mikadoi and H. dauricus, and moderately to significantly so for A. sinensis (Meadows and Coll, 2013). The main role of this threat was with historical fisheries causing large declines in these species. Commercial and recreational sturgeon fisheries have existed since at least the 5th century BC and are noted in ancient Greek, Roman, and Chinese literature (Pikitch et al., 2005). All major sturgeon fisheries surpassed peak productivity levels by the mid-20th century, with 70 percent of major fisheries posting recent harvests less than 15 percent of historical peak catches and 35 percent of the fisheries examined crashing within 7 to 20 years of inception (Pikitch et al., 2005; Bronzi et al., 2011a). The commercial caviar trade centers have shifted geographically through time. In the archeological sites of Ralswiek in Germany (8th through 12th century) and of

Gdansk in Poland (10th through 13th century) the proportion of sturgeons in the excavations fell from 70 percent at the start to 12–13 percent at the end of the occupation of both sites, suggesting a progressive overexploitation and decline (Debus, 1997). By the 19th century, the United States was the top caviar producer, primarily from A. oxyrinchus oxyrinchus, until those stocks declined as well (Birstein, 1997; Secor, 2002). By the end of the 19th century, Russia was a major caviar trading nation and by the early 20th century Russian sturgeon harvests were seven times greater than historical peak U.S. catches (Taylor, 1997; Secor et al., 2000). Next, the Caspian Sea states of Iran, Kazakhstan, and Russia dominated the international trade in capture fisheries products, while the United States, Japan, the European Union and Switzerland were the major importers (De Meulenaer and Raymakers, 1996; Hoover, 1998; Raymakers, 2002). The dissolution of the Soviet Union is considered to be a turning point in sturgeon fisheries management, after which increased illegal harvest and trade ensued, flooding the international market with illegal, low quality, inexpensive caviar (Meadows and Coll, 2013). While historical overfishing has played a significant role in the decline of these species, bycatch is currently the main threat in this category for all species except A. sinensis and H. dauricus, where we have no information on bycatch.

CITES has regulated international trade in all species of sturgeon since 1998 (CITES 2013). CITES Appendix II listings allow sustainable commercial trade, while Appendix I listings ban most commercial trade. One of the petitioned species, Acipenser sturio, was added to CITES Appendix II in 1975, and transferred to Appendix I in 1983. The remaining petitioned species were added to CITES Appendix II in April 1998. CITES Resolution Conf. 12.7 (Revised at the Convention of the Parties 14 in 2007)(CITES, 2002), requires reporting of annual export and catch quotas to the CITES Secretariat and registration of processing and packaging plants. Since 2008, wild capture export quotas are zero under CITES. Studies of international trade give evidence for a high proportion (7–25 percent) of caviar with the wrong species origin assigned and labeled and sold on the world market (Meadows and Coll, 2013). In 2011, CITES appeared pessimistic about efforts to control illegal trade, stating: “It is several years since the Secretariat received any information from sturgeon range States about poaching or illegal trade. The Secretariat's enforcement-related staff, who not so long ago devoted very significant amounts of time in assisting the combating of illegal trade in caviar, now spend hardly any time on this matter” (CITES, 2011). In a review of Chinese sturgeon aquaculture, Wei et al. (2011) note new markets and products, including medical and health products, cosmetics, and leather, have appeared in recent years. This could lead to increased demand that may increase pressure for illegal, unreported, and unregulated fishing. They also noted declines in the number of seedlings needed from the wild or imported from other countries, which would tend to decrease pressure on wild stocks.

Bycatch (Gessner, personal communication) and recreational fishing (Williot, personal communication) are the main current problems in this category for A. naccarii. This species is fished commercially and recreationally. It is fished for its meat and the roe is not currently consumed as caviar (Kottelat and Freyhoff, 2007).

Acipenser sturio is prized for its flesh and its caviar, and was an important commercial fish for centuries in some locations until early in the 20th century when populations declined below viable levels for a fishery (Williot et al., 2002a). Gessner et al. (2011) provide a summary of fishery data and information, largely from German waters, where the use of European sturgeon by humans has been documented in archaeological sites dating back to 100 B.C. Rough estimates of catch are available all the way back to the Middle Ages (Meadows and Coll, 2013). Bycatch in other fisheries is a current threat, with an estimated bycatch of up to 200 fish per year from gillnets and trawling at sea (Rosenthal et al., 2007; Freyhoff et al., 2010). In France, a program was recently carried out to minimize bycatch and those efforts are spreading throughout Europe (Michelet, 2011).

Acipenser sinensis was a major commercial fishery resource in the 1960s, but by the end of the 1970s catch had declined to 500 fish and has not recovered (Wei, 2010a). Drift nets were used to catch it in the river and set nets were used at the river mouth (Wei, 2010a). Commercial fishing has been prohibited since 1983 (Billard and Lecointre, 2001).

Acipenser mikadoi was harvested commercially in the past and illegal poaching continues to be a threat (Shilin, 1995; Mugue, 2010). Bycatch from salmon trawling off the coast is also a threat (Shilin, 1995; Mugue, 2010).

Overutilization is thought to be the main threat that caused the decline of H. dauricus (Birstein et al., 1999). The species has been fished commercially since the 1800s in Russia and since at least the 1950s in China (CITES, 2000). Peak catch for the species was in 1891 (585 tons) (Krykhtin and Svirskii, 1997b; Koshelev and Ruban, 2012). In the last century, catch fluctuated between 100 and 400 tons annually on the Chinese side of the Amur River, and since the 1990s has been below 100 tons on the Russian side (Pikitch et al., 2005). On the Chinese side, fishing impacts were low before the 1970s, because few people lived along the Amur River. However, with increasing population and the high profit of sturgeon fishing, catches increased after that time (Wei et al., 1997). Illegal poaching for caviar remains a threat on the Russian side, where fishing is now severely restricted (Ruban and Wei, 2010). International trade in caviar from H. dauricus declined from 1999 to 2004. No CITES quota for wild caught fish was made after 2008.

Disease and Predation

We determine disease and predation are potential threats to each of the five species of sturgeon, but the level of threat varies by species. This threat is ranked most highly for A. sinensis (moderate to high) and H. dauricus (low to moderate) (Meadows and Coll, 2013). Competition for habitat with the Wels catfish, Silurus glanis, may have contributed to the decline of A. naccarii (Arlati et al., 2011). Silurus glanis is also a potential predator of this species (Gessner, personal communication). In December 1999 several thousand juvenile and several hundred gravid female A. baerii escaped into the Gironde River (Bordeaux region) in France during two storms. The survival of the escaped fish and their short-term effect on A. sturio are documented by Rochard et al. (2001), but the escaped fish were not documented for years after and likely are now extirpated (Williot, personal communication). Introduced exotic sturgeon in the Yangtze River are an identified threat to A. sinensis (Li et al., 2009). Since the end of the 1990s, farmers began cage-farming many exotic sturgeon species in the Yangtze River (Wei et al., 1997; Shi et al., 2002). None of these legally farmed sturgeons (including A. schrenckii, H. dauricus, and their hybrids) are native to the Yangtze River system, so they could compete with native sturgeon. In 2006 the A. sinensis Emergency Center (Changshu City, Jiangsu Province) collected 221 young sturgeon from their fishery resources monitoring nets in the Yangtze River. Seventy percent were hybrids, while only 30 percent were pure A. sinensis (Chen, 2007). Liu (1995) notes that an estimated 90 percent of the eggs on the spawning site near the Gezhouba

Dam are eaten by the bronze gudgeon, Coreius heterodon, and asserts as a result, the sturgeon population is further declining (Deng and Yan, 1991). No competition, disease or unusual predation threats have been identified for A. mikadoi.

Hybrid H. dauricus (crossed with A. schrenckii) are cultured in China (Li et al. 2011, Wei et al., 2011) and considered by some to be a risk factor to the species status (Chelomina et al. 2008). About 35 percent of Chinese caviar production from 2007-2009 came from these hybrids. There is no documentation of interactions with hybrids, however. Investigations on ovaries by Svirskii (see Krykhtin and Svirskii, 1997a) showed that a parasite, Polypodium hydroforme, decreased the fecundity of H. dauricus by approximately 19 percent.

Inadequacy of Existing Regulatory Mechanisms

We identified inadequacy of existing regulatory mechanisms as a potential threat to each of the five species of sturgeon. We determined that this factor alone, or in combination with other factors, is currently contributing moderately to significantly to the risk of extinction for each species, with greater variability in the voting on this threat than for any of the other five threats (Meadows and Coll, 2013). Despite listing under CITES, and species-specific domestic management and conservation measures, there remains an overall decline in wild sturgeon populations, with historical overutilization, poaching, and habitat destruction among the main causes. There are few regulations in place that are able to manage population size at sustainable levels. Only A. sturio is listed on CITES Appendix I, and thus has a commercial trade ban. Implementation of the CITES Appendix II listings for the other sturgeons has been challenging. CITES parties had to adopt resolutions to require range countries to declare coordinated annual export and catch quotas, develop marking and labeling systems, cooperate regionally, and, where possible, establish a system of registration or licensing or both for importers and exporters of caviar. Ten sturgeon species were considered under the CITES Review of Significant Trade process, which resulted in recommendations affecting Caspian Sea range countries. Studies of international trade (Raymakers, 2002; Ludwig, 2006) give evidence for a high proportion (7–25%) of caviar with the wrong species origin assigned and sold on the world market. Sturgeon stocks continued to decline and since 2008 wild capture export quotas under CITES are zero. In 2011, the CITES Secretariat noted that "Despite the best efforts of the CITES community, it appears that the goal of legal and sustainable harvest of caviar … appears unattainable for the present." (CITES, 2011).

Given the low to very low numbers of reproductively mature adults and the relatively modest stocking efforts on a range-wide scale, the above regulations are not likely to be sufficient to sustainably manage these species without conservation protections. Moreover, it is currently unclear whether the range countries for the petitioned sturgeon species have the resources and personnel to enforce existing regulatory measures as reports of poaching and illegal trade are widespread. Compliance is another problem and requires more consolidated efforts. We seek more detailed information on efforts in these areas in our public comment process (see below).

Bycatch is a major current threat to A. naccarii, A. sturio, and A. mikadoi, but we are not aware of any regulations addressing this threat, though a voluntary program started in France has spread through much of the range of A. sturio (Michelet, 2011).

For A. naccarii, fishing is prohibited in the three regions of Italy where a recovery plan is in place: Lombardy, Emilia-Romagna and Veneto (Bronzi et al., 2006). It is not otherwise protected by law in Italy or elsewhere in its range that we have identified. Acipenser naccarii is listed in Appendix II of the Bern Convention on the Conservation of European Wildlife and Natural Habitats. All countries that have signed the convention must promote national conservation policies, measures against pollution, and educational and informative measures. They must also co-ordinate efforts to protect at-risk species. For Appendix II species, the following is prohibited: all forms of deliberate capture and killing; the deliberate damage to or destruction of breeding or resting sites; deliberate disturbance, the deliberate destruction or taking of eggs from the wild or keeping these eggs even if empty; and the possession of and internal trade in these animals, alive or dead. While important and helpful, we conclude these regulatory mechanisms do not ensure the sustainability or status of this species because they are incomplete, and they may have enforcement difficulties.

Acipenser sturio is currently considered by the European community to be a critically endangered species. A recent revision of the status of A. sturio by the IUCN in 2009 concluded the species status is "critically endangered" (Freyhoff et al., 2010). It is protected by all of the nations in its present distribution area, either by their national laws or by international conventions and European directives (Rosenthal et al., 2007; Rochard, 2011). The following international conventions and directives protect the species: (1) Appendix I of CITES, which prohibits its international trade except for scientific research; (2) Appendix I of the Convention on Migratory Species (CMS); (3) Appendix II of the Bern Convention; (4) Appendix II of the European Council Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora, which lists animal and plant species of community interest whose conservation requires the designation of special areas of conservation; and 5) the list of threatened and/or declining species under the Convention Protecting and Conserving the North-East Atlantic and its Resources, which sets protection priorities by its parties (Rochard, 2011). Acipenser sturio was included in Appendix II of the CMS in 1999. In 2005, it was added to Appendix I, which lists migratory species in danger of extinction. The European sturgeon is listed as a strictly protected species (Annex II) in the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention). In European Community Law, especially the Habitat Directive, the species is listed among the animals of Community interest (Annex II) whose conservation requires the designation of Special Areas of Conservation (SAC) (Williot et al., 2009). Eleven areas have been designated up to now, and six others are in the process of being approved (Rosenthal et al., 2007). In 2003, the "Regional Strategy for the Conservation and Sustainable Management of Sturgeon Populations of the Northwest Black Sea and Lower Danube River in accordance with CITES" was signed by Serbia, Bulgaria, Romania and Ukraine (Rogin, 2011). The European action plan, which particularly relies on in situ conservation, ex situ measures, stocking of hatchery-reared young, and habitat restoration, was recently drafted and implementation has begun (Rosenthal et al., 2007). Within its current range, conservation actions are in place to limit incidental captures and poaching, and to improve the protection of habitats (Williot et al., 1997). A total ban on fishing and marketing of the species was applied in France in 1982 (Gessner, 2000). Despite these instruments currently in place, implementation is difficult due to lack of funds, fishermen who still catch and sell the species (Lepage and Rochard, 2011), and lack of knowledge or willingness of administrations in charge of management to enforce current regulations (Williot and Castelnaud, 2011). Williot et al. (2011c) also concluded that inadequate implementation of fisheries regulations and species conservation restrictions have inhibited the species conservation and recovery success. Today the main driver is the low number of individual fish (Gessner, personal communication).

In 1988, A. sinensis was listed as a state protected animal in class I in China (Wei et al., 1997). In 1996, Yichang Chinese Sturgeon Nature Reserve was established to protect the spawning population. In 2002, a Chinese Sturgeon Nature Reserve in the Yangtze River estuary was established to protect juvenile sturgeons gathering there (Wei, 2010a). The effectiveness of these measures is unclear, but it is thought that poaching still occurs (Wei, 2010a).

Since 1983, A. mikadoi has been listed in the Red Data Book of the Russian Federation, which provides for a complete ban on fishing (Germany, 1998). The effectiveness of these measures is unclear, but given the population size, appears limited.

In the Russian Federation, a prohibition on the commercial catch of H. dauricus has been in place during 1923-1930, 1958-1976 and from 1984 to the present (Vaisman and Fomenko, 2007). However, a tolerance called "controlled catch" for incidental and scientific catches is allowed. These catches are the current source of caviar and sturgeon meat from the Amur River. The "controlled catch" is apparently not well defined and difficult to control and enforce (TRAFFIC, 2000). Experts and government officials have reported increasing pressure from illegal fishing practices and criminal activities around sturgeon poaching and black markets that have been reported in a large part of the range (Medetsky, 2000; Winchester, 2000). The current situation is not known. In China, Heilongjiang Province authorities issued protection and management regulations, such as gear restrictions, harvest size, closed seasons and areas, and the requirement of a fishing license in the early 1950s. These were renewed in 1982. The Ordinance of 1982 prescribed minimum size limits for H. dauricus at 200 cm or 65 kg. Fishing activities on the Heilong (Amur) River are prohibited from mid-June to mid-July. The protocol also established areas where fisheries are permanently prohibited. In 1991, 2,248 sturgeon fishing licenses were issued, and in 2000, the number was reduced to 1,850. However, the regulations have not been fully implemented (Wei et al., 1997; Wei et al., 2004) and do not appear to be effective enough to reverse the species decline.

Other Natural or Manmade Factors Affecting its Continued Existence

We determine that other natural or manmade factors are potential threats to each of the five species of sturgeon, but the level of threat is generally no more than moderate, except for a high threat level for A. sturio (Meadows and Coll, 2013). Small population size is a problem to varying degrees for all petitioned species. Small population size can lead to loss of adaptation in species through genetic drift and Allee effects. Small populations are also subject to greater variation in population size and risk of extirpation from a variety of density-independent disasters. Climate change may impact all of the petitioned species, though sturgeon-specific studies and predictions are rare and there is great uncertainty. Hydrologic changes that are likely to affect spawning grounds are probably the most likely effect of climate change. Lassalle and Rochard (2009) estimated impacts of climate change to diadromous fishes in Europe, the Middle East and North Africa, and predicted that the majority of species would have range contractions, including A. naccarii.

Acipenser naccarii has been hybridized with A. baerii in captive breeding facilities (CITES 2000). These fish have been known to sporadically escape from rearing plants or angling ponds, or are released when they become too large for private aquaria (CITES, 2000). There is no documentation on the extent or potential damage of the introduction of these hybrids, but competition with hybrids is likely.

Acipenser sturio is vulnerable to overutilization due to its late age at first reproduction and multi-year reproductive cycle and low population size (Rosenthal et al., 2007). Lassalle et al. (2011) modeled potential impacts of climate change on habitat availability throughout the species' range out to the year 2100. They found that much of the species' spawning habitat would be negatively affected, particularly in the southern part of its range. However, five basins where reintroductions are planned or occurring are predicted to remain suitable.

The long lifespan and late maturation of A. sinensis make it susceptible to overexploitation. Zhang et al. (2000) screened the nuclear genomes of 70 samples collected in the Yangtze River from 1995 to 1997 and found low genetic variability. Ship strikes and excessive sound have also been noted as threats for this species (Wang et al., 2011).

No other threats have been identified for A. mikadoi.

Huso dauricus is vulnerable to overutilization due to its late age at first reproduction and multi-year reproductive cycle.

Synergistic Effects

Recent research has shown that synergistic interactions among threats often lead to higher extinction risk than predicted based on the individual threats (Brook et al., 2008). "Like interactions within species assemblages, synergies among stressors form self-reinforcing mechanisms that hasten the dynamics of extinction. Ongoing habitat destruction and fragmentation are the primary drivers of contemporary extinctions, particularly in the tropical realm, but synergistic interactions with hunting, fire, invasive species and climate change are being revealed with increasing frequency" (Brook et al., 2008). "[H]abitat loss can cause some extinctions directly by removing all individuals over a short period of time, but it can also be indirectly responsible for lagged extinctions by facilitating invasions, improving hunter access, eliminating prey, altering biophysical conditions and increasing inbreeding depression. Together, these interacting and self-reinforcing systematic and stochastic processes play a dominant role in driving the dynamics of population trajectories as extinction is approached" (Brook et al., 2008). For most of these sturgeon species it is likely that the interactive effects of the multiple threats identified herein are having multiplicative effects on extinction risk. In particular, habitat loss, range contractions, and decreased water quality are likely to interact in ways to multiplicatively increase the extinction risk of these species, especially as populations reach such small sizes that Allee effects, genetic drift, and disasters can dominate population dynamics. Studies to determine the specific magnitude of these synergistic effects are lacking for all five species. As a result, extinction risk analysis team members' scores varied significantly for this category (Meadows and Coll, 2013).

Overall Risk Summary

After considering the extinction risks for each of the five species of sturgeon, we have determined that Acipenser naccarii, A. sturio, A. sinensis, A. mikadoi and Huso dauricus are in danger of extinction throughout all of their ranges, largely due to 1) present or threatened destruction, modification or curtailment of habitat, 2) overutilization for commercial, recreational, scientific, or educational purposes, and 3) inadequacy of existing regulatory mechanisms.

Protective Efforts

Section 4(b)(1)(A) of the ESA requires the Secretary, when making a listing determination for a species, to take into consideration those efforts, if any, being made by any State or foreign nation to protect the species. In judging the efficacy of not yet implemented efforts, or those existing protective efforts that are not yet fully effective, we rely on the Services' joint "Policy for Evaluation of Conservation Efforts When Making Listing Decisions" ("PECE"; 68 FR 15100; March 28, 2003). The PECE policy is designed to ensure consistent and adequate evaluation of whether any conservation efforts that have been recently adopted or implemented, but not yet proven to be successful, will result in recovering the species to the point at which listing is not warranted or contribute to forming the basis for listing a species as threatened rather than endangered. The PECE policy is expected to facilitate the development of conservation efforts that sufficiently improve a species' status so as to make listing the species as threatened or endangered unnecessary.

The PECE policy establishes two basic criteria to use in evaluating efforts identified in conservations plans, conservation agreements, management plans or similar documents: 1) the certainty that the conservation efforts will be implemented; and 2) the certainty that the efforts will be effective. We evaluated conservation efforts we are aware of to protect and recover sturgeon that are either underway but not yet fully implemented, or are only planned. We seek additional information on other conservation efforts in our public comment process (see below).

We are aware of the stocking program in Italy for A. naccarii, as described in Bronzi et al. (2011a) and Meadows and Coll (2013). No reproduction of stocked fish has been confirmed. The certainty that this program will continue to be implemented in the future is unclear. Given this, it is impossible to determine whether these stocking efforts will be effective in conserving or improving the status of this species. In fact, as discussed above, stocking efforts can contribute to extinction risk if not conducted carefully, especially with consideration of suitable habitat and genetic composition of the donor populations. We are unaware of any other major conservation efforts for this species, though efforts to conserve A. sturio described below could help this species. However, these efforts are also not certain to be implemented.

A large number of conservation efforts are underway for A. sturio. Some are discussed in the above sections and accounted for in the extinction risk analysis. Other efforts are discussed here for historical continuity, but the effectiveness of the early efforts was fully considered in the extinction risk analysis above. Hatchery releases have occurred in a number of places starting in 1995 in France and 1996 in Germany (Kirschbaum et al., 2000; Williot et al., 2002b), with both countries cooperating extensively in these efforts (Williot and Kirschbaum 2011). The first results in France indicated that A. sturio is rather difficult to grow under controlled conditions compared to most other sturgeon species (Williot et al., 1997). Kirschbaum et al. (2000) however, were more recently able to achieve growth rates in the German program similar to those in the wild, though captive temperatures were warmer. Williot and Castelnaud (2011) and Williot et al. (2011d) summarize conservation measures implemented for France. Williot et al. (2009) describe many years of efforts to establish a successful conservation hatchery program in France. Hatchery rearing first started in 1995 in a facility in the Gironde system in France, with successful artificial propagation only occurring in 1995 and 2007 (Williot et al., 2009). Hatchlings (2000) and later fingerlings (5,000 of ~1g weight in June 1995 and 2,000 ~6.5 g in August 1995) were released in equal numbers into the Garonne and Dordogne Rivers from the first event (Williot et al., 2009). The 2007 event was the first successful reproduction of fish reared in captivity their entire lives (Williot et al., 2009). Since

2007, improved rearing success has resulted in successful propagation every year, with about 135,000 juveniles being released from the French facility through 2010 (Acolas et al., 2011a; Rochard and Lambert, 2011). However, poor sperm quality and a limited number of reproductive females limit the ability to increase hatchery production and restrain genetic diversity (Tiedemann et al., 2011).

Gessner (2000) documents conservation efforts in place in the late 1990s in Germany. In 1994, efforts to reestablish A. sturio in Germany were launched by scientists and aquaculturists at the Society to Save the Sturgeon, with Federal government support (Kirschbaum and Gessner, 2000). A broodstock program was developed with 1,600 animals donated from France. These broodstock fish, however, have low genetic diversity, as most of the fish are full siblings (Kirschbaum et al., 2011). Kirschbaum et al. (2011) update the above information with discussion of more recent restoration efforts in Germany, which have most prominently included the release of 200 juvenile fish from 2008-2010. According to Gessner (personal communication), that number has reached 10,000 juveniles through 2013.

European countries have completed a draft conservation action plan for the species (Rosenthal et al., 2007; Moreau, 2011) that details specific objectives and actions for the species' conservation. Nevertheless, the plan guarantees no funding and thus implementation, let alone effectiveness, is highly uncertain. The certainty that all of the above described conservation efforts for A. sturio will be implemented or continued is unclear. Given all of the above, it is impossible to determine whether these stocking efforts will be effective in conserving or improving the status of this species.

We are aware of the stocking program for A. sinensis as described above and in Bronzi et al. (2011a) and Meadows and Coll (2013). The certainty that this program will continue to be implemented in the future is unclear. The small amount of spawning habitat available likely limits the potential effectiveness of this program. Given all of the above, it is impossible to determine whether these stocking efforts will be effective in conserving or improving the status of this species.

An artificial propagation programs exists for A. mikadoi, and reintroductions have occurred with a total of 60 individuals being released in 2005 and 2009 into Lake Tunaicha in the southeast of Sakhalin (Koshelev et al., 2012). No reproduction of stocked fish has been confirmed. The certainty that this program will continue to be implemented in the future is unclear. Given all of the above, it is impossible to determine whether these stocking efforts will be effective in conserving or improving the status of this species.

We are aware of the stocking programs for H. dauricus as described above and in Bronzi et al. (2011a) and Meadows and Coll (2013). Russia cultures pure H. dauricus, releasing about 1 million per year in the late 1990s (Chebanov and Billard, 2001) and with only small production continuing through the 2000s (Li et al., 2009). The species is also cultured in China and released into the Amur River in unknown quantities (Wei et al., 2004). No reproduction of stocked fish has been confirmed. The certainty that these programs will continue to be implemented in the future is unclear. Given all of the above, it is impossible to determine whether these stocking efforts will be effective in conserving or improving the status of this species.

We are aware of no other conservation efforts that have been recently adopted or implemented, but not yet proven to be successful, that could modify the risk of extinction for any of these species and that would require consideration under the PECE policy. Therefore, we conclude that the identified conservation efforts do not alter the extinction risk assessments for any of the five petitioned sturgeon species.

Proposed Determination

Section 4(b)(1) of the ESA requires that we make listing determinations based solely on the best scientific and commercial data available after conducting a review of the status of the species and taking into account those efforts, if any, being made by any state or foreign nation, or political subdivisions thereof, to protect and conserve the species. We have reviewed the best available scientific and commercial information, including the petition, and the information in the review of the status of the five species of sturgeon, and we have consulted with species experts. We are responsible for determining whether Acipenser naccarii (Adriatic sturgeon), A. sturio (European sturgeon), A. sinensis (Chinese sturgeon), A. mikadoi (Sakhalin sturgeon) and Huso dauricus (Kaluga sturgeon) are threatened or endangered under the ESA (16 U.S.C. 1531 et seq.). Accordingly, we have followed a stepwise approach as outlined above in making this listing determination for these five species of sturgeon. We have determined that Acipenser naccarii (Adriatic sturgeon), A. sturio (European sturgeon), A. sinensis (Chinese sturgeon), A. mikadoi (Sakhalin sturgeon) and Huso dauricus (Kaluga sturgeon) constitute species as defined by the ESA.

Based on the information presented, we find that all five species of sturgeon are in danger of extinction throughout all of their ranges. We assessed the ESA section 4(a)(1) factors and conclude the Adriatic, European, Chinese, Sakhalin and Kaluga sturgeon all face ongoing threats from habitat alteration, overutilization for commercial and recreational purposes, and the inadequacy of existing regulatory mechanisms throughout their ranges. Acipenser sturio also face high risks from its life history and published predictions of the effects of climate change (Lassalle et al., 2011). All of the threats attributed to the species' decline are ongoing except the largely historical threat from directed fisheries. After considering efforts being made to protect these sturgeon, we could not conclude that the proposed conservation efforts would alter the extinction risk for any of these five species.

Effects of Listing

Conservation measures provided for species listed as endangered or threatened under the ESA include recovery actions (16 U.S.C. 1533(f)), concurrent designation of critical habitat if prudent and determinable (16 U.S.C. 1533(a)(3)(A)); Federal agency requirements to consult with NMFS under Section 7 of the ESA to ensure their actions do not jeopardize the species or result in adverse modification or destruction of critical habitat should it be designated (16 U.S.C. 1536); and prohibitions on taking (16 U.S.C. 1538). Recognition of the species' plight through listing promotes conservation actions by Federal and state agencies, foreign entities, private groups, and individuals. Therefore, the main effects of this proposed listing are prohibitions on take, including export and import.

Identifying Section 7 Consultation Requirements

Section 7(a)(2) (16 U.S.C. 1536(a)(2)) of the ESA and NMFS/USFWS regulations require Federal agencies to consult with us to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of listed species or destroy or adversely modify critical habitat. Section 7(a)(2) (16 U.S.C. 1536(a)(2)) of the ESA and NMFS/USFWS regulations also require Federal agencies to confer with us on actions likely to jeopardize the continued existence of species proposed for listing, or that result in the destruction or adverse modification of proposed critical habitat. It is possible that the listing of the five species of sturgeon under the ESA may create a minor increase in the number of section 7 consultations, though consultations are likely to be rare given that these species mostly occur in foreign territorial waters.

Critical Habitat

Critical habitat is defined in section 3 of the ESA (16 U.S.C. 1532(5)) as: (1) the specific areas within the geographical area occupied by a species, at the time it is listed in accordance with the ESA, on which are found those physical or biological features (a) essential to the conservation of the species and (b) that may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by a species at the time it is listed upon a determination that such areas are essential for the conservation of the species. "Conservation" means the use of all methods and procedures needed to bring the species to the point at which listing under the ESA is no longer necessary. Section 4(a)(3)(A) of the ESA (16 U.S.C. 1533(a)(3)(A)) requires that, to the extent prudent and determinable, critical habitat be designated concurrently with the listing of a species. However, critical habitat shall not be designated in foreign countries or other areas outside U.S. jurisdiction (50 CFR §424.12 (h)).

The best available scientific and commercial data as discussed above identify the geographical areas occupied by Acipenser naccarii, A. sturio, A. sinensis, A. mikadoi and Huso dauricus as being entirely outside U.S. jurisdiction, so we cannot designate critical habitat for these species. We can designate critical habitat in unoccupied areas in the United States if the area(s) are determined by the Secretary to be essential for the conservation of the species. Regulations at 50 CFR §424.12 (e) specify that we shall designate as critical habitat areas outside the geographical range presently occupied by the species only when the designation limited to its present range would be inadequate to ensure the conservation of the species.

The best available scientific and commercial information on these species does not indicate that U.S. waters provide any specific essential biological function for any of them. Based on the best available information, we have not identified unoccupied area(s) that are currently essential to the conservation of any of the sturgeons proposed for listing. Therefore, based on the available information, we do not intend to designate critical habitat for Acipenser naccarii, A. sturio, A. sinensis, A. mikadoi or Huso dauricus.

Identification of Those Activities That Would Constitute a Violation of Section 9 of the ESA

On July 1, 1994, NMFS and FWS published a policy (59 FR 34272) that requires us to identify, to the maximum extent practicable at the time a species is listed, those activities that would or would not constitute a violation of section 9 of the ESA. Because we are proposing to list all five sturgeons as endangered, all of the prohibitions of Section 9(a)(10) of the ESA will apply to all five species. These include prohibitions against the import, export, use in foreign commerce, or “take” of the species. Take is defined as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.” These prohibitions apply to all persons subject to the jurisdiction of the United States, including in the United States, its territorial sea, or on the high seas. The intent of this policy is to increase public awareness of the effects of this listing on proposed and ongoing activities within the species’ range. Activities that we believe could result in a violation of section 9 prohibitions of these five sturgeons include, but are not limited to, the following:

(1) Take within the United States or its territorial sea, or upon the high seas;

(2) Possessing, delivering, transporting, or shipping any sturgeon part;

(3) Delivering, receiving, carrying, transporting, or shipping in interstate or foreign commerce any sturgeon or sturgeon part, in the course of a commercial activity;

(4) Selling or offering for sale in interstate commerce any part, except antique articles at least 100 years old;

(5) Importing or exporting sturgeon or any sturgeon part to or from any country;

(6) Releasing captive sturgeon into the wild. Although sturgeon held non-commercially in captivity at the time of listing are exempt from certain prohibitions, the individual animals are considered listed and afforded most of the protections of the ESA, including most importantly, the prohibition against injuring or killing. Release of a captive animal has the potential to injure or kill the animal. Of an even greater conservation concern, the release of a captive animal has the potential to affect wild populations of native sturgeon through introduction of diseases or inappropriate genetic mixing;

(7) Harming captive sturgeon by, among other things, injuring or killing a captive sturgeon, through experimental or potentially injurious veterinary care or conducting research or breeding activities on captive sturgeon, outside the bounds of normal animal husbandry practices. Captive breeding of sturgeon is considered experimental and potentially injurious. Furthermore, the production of sturgeon progeny has conservation implications (both positive and negative) for wild populations. Experimental or potentially injurious veterinary procedures and research or breeding activities of sturgeon may, depending on the circumstances, be authorized under an ESA 10(a)(1)(A) permit for scientific research or the enhancement of the propagation or survival of the species.

We will identify, to the extent known at the time of the final rule, specific activities that will not be considered likely to result in a violation of section 9 of the ESA. Although not binding, we are considering the following actions, depending on the circumstances, as not being prohibited by ESA Section 9:

(1) Take of a sturgeon authorized by an ESA section 10(a)(1)(A) permit authorized by, and carried out in accordance with the terms and conditions of an ESA section 10(a)(1)(A) permit issued by NMFS for purposes of scientific research or the enhancement of the propagation or survival of the species;

(2) Continued possession of sturgeon parts that were in possession at the time of listing. Such parts may be non-commercially exported or imported; however the importer or exporter must be able to provide evidence to show that the parts meet the criteria of ESA section 9(b)(1) (i.e., held in a controlled environment at the time of listing, in a non-commercial activity);

(3) Continued possession of live sturgeon that were in captivity or in a controlled environment (e.g., in aquaria) at the time of this listing, so long as the prohibitions under ESA section 9(a)(1) are not violated. Facilities must provide evidence that the sturgeon were in captivity or in a controlled environment prior to listing. We suggest such facilities submit information to us on the sturgeon in their possession (e.g., size, age, description of animals, and the source and date of acquisition) to establish their claim of possession (see For Further Information Contact); and

(4) Provision of care for live sturgeon that were in captivity at the time of listing. These individuals are still protected under the ESA and may not be killed or injured, or otherwise

harmed, and, therefore, must receive proper care. Normal care of captive animals necessarily entails handling or other manipulation of the animals, and we do not consider such activities to constitute take or harassment of the animals so long as adequate care, including veterinary care, such as confining, tranquilizing, or anesthetizing sturgeon when such practices, procedures, or provisions are not likely to result in injury, is provided; and

(5) Any interstate and foreign commerce trade of sturgeon already in captivity. Section 11(f) of the ESA gives NMFS authority to promulgate regulations that may be appropriate to enforce the ESA. NMFS may promulgate future regulations to regulate trade or holding of these sturgeon, if necessary. NMFS will provide the public with the opportunity to comment on future proposed regulations.

Role of Peer Review

In December 2004, the Office of Management and Budget (OMB) issued a Final Information Quality Bulletin for Peer Review establishing a minimum peer review standard. Similarly, a joint NMFS/FWS policy (59 FR 34270; July 1, 1994) requires us to solicit independent expert review from qualified specialists, concurrent with the public comment period. The intent of the peer review policy is to ensure that listings are based on the best scientific and commercial data available. We solicited peer review comments on the status review report from 12 outside scientists and two NMFS scientists familiar with sturgeons. We received comments from four of these scientists and their comments are incorporated into the status review report and this document. Prior to a final listing, we will solicit the expert opinions of several qualified specialists selected from the academic and scientific community, Federal and State agencies, and the private sector on these listing recommendations to ensure the best biological and commercial information is being used in the decision-making process, as well as to ensure that reviews by recognized experts are incorporated into the review process of rulemakings developed in accordance with the requirements of the ESA.

We will consider peer review comments in making our final determination, and include a summary of the comments and recommendations, if a final rule is published.

References

A complete list of the references used in this proposed rule is available upon request (see ADDRESSES).

Classification

National Environmental Policy Act

The 1982 amendments to the ESA, in section 4(b)(1)(A), restrict the information that may be considered when assessing species for listing. Based on this limitation of criteria for a listing decision and the opinion in Pacific Legal Foundation v. Andrus, 675 F. 2d 825 (6th Cir. 1981), NMFS has concluded that ESA listing actions are not subject to the environmental assessment requirements of the National Environmental Policy Act (NEPA) (See NOAA Administrative Order 216-6).

Executive Order 12866, Regulatory Flexibility Act, and Paperwork Reduction Act

As noted in the Conference Report on the 1982 amendments to the ESA, economic impacts cannot be considered when assessing the status of a species. Therefore, the economic analysis requirements of the Regulatory Flexibility Act are not applicable to the listing process.

In addition, this proposed rule is exempt from review under Executive Order 12866. This proposed rule does not contain a collection-of-information requirement for the purposes of the Paperwork Reduction Act.

Executive Order 13132, Federalism

In accordance with E.O. 13132, we determined that this proposed rule does not have significant Federalism effects and that a Federalism assessment is not required. In keeping with the intent of the Administration and Congress to provide continuing and meaningful dialogue on issues of mutual state and Federal interest, this proposed rule will be given to the relevant governmental agencies in the countries in which the species occurs, and they will be invited to comment. We will confer with the U.S. Department of State to ensure appropriate notice is given to foreign nations within the range of all five species. As the process continues, we intend to continue engaging in informal and formal contacts with the U.S. State Department, giving careful consideration to all written and oral comments received.

Public Comments Solicited

We intend that any final action resulting from this proposal will be as accurate as possible and informed by the best available scientific and commercial information. Therefore, we request comments or information from the public, other concerned governmental agencies, the scientific community, industry, environmental groups or any other interested party concerning this proposed rule. We particularly seek comments containing:

(1) Information concerning the location(s) of any sightings or captures of the species;

(2) Information concerning the threats to the species;

(3) Taxonomic information on the species;

(4) Biological information (life history, genetics, population connectivity, etc.)

(5) Efforts being made to protect the species throughout their current ranges;

(6) Information on the commercial trade of these species; and

(7) Historical and current distribution and abundance and trends.

We request that all information be accompanied by: 1) supporting documentation such as maps, bibliographic references, or reprints of pertinent publications; and 2) the submitter's name, address, and any association, institution, or business that the person represents.

Public hearing requests must be made by [insert date 45 days after publication in the FEDERAL REGISTER].

List of Subjects in 50 CFR Part 224

Administrative practice and procedure, Endangered and threatened species, Exports, Imports, Reporting and record keeping requirements, Transportation.

Dated: October 22, 2013.

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Alan D. Risenhoover.

Director, Office of Sustainable Fisheries, performing the functions and duties of the

Deputy Assistant Administrator for Regulatory Programs,

National Marine Fisheries Service.

For the reasons set out in the preamble, 50 CFR part 224 is proposed to be amended as follows:

PART 224—ENDANGERED MARINE AND ANADROMOUS SPECIES

1. The authority citation for part 224 continues to read as follows:

Authority: 16 U.S.C. 1531-1543 and 16 U.S.C 1361 et seq.

2. In § 224.101, paragraph (a), add entries for five species at the end of the table to read as follows:

§ 224.101 Enumeration of endangered marine and anadromous species.

* * * * *

(a) ***.

Species[1]		Where Listed	Citation(s) for listing determination(s)	Citation(s) for critical habitat designation(s)
Common name	Scientific name			
*******				
Adriatic sturgeon	Acipenser naccarii	Everywhere Found	Insert FEDERAL REGISTER citation and date when published as a final rule]	NA
European sturgeon	Acipenser sturio	Everywhere Found	Insert FEDERAL REGISTER citation and date when published as a final rule]	NA
Chinese sturgeon	Acipenser sinensis	Everywhere Found	Insert FEDERAL REGISTER citation and date when published as a final rule]	NA
Sakhalin sturgeon	Acipenser mikadoi	Everywhere Found	Insert FEDERAL REGISTER citation and date when published as a final rule]	NA
Kaluga sturgeon	Huso dauricus	Everywhere Found	Insert FEDERAL REGISTER citation and date when published as a final rule]	NA

[1] Species includes taxonomic species, subspecies, distinct population segments (DPSs) (for a policy statement, see 61 FR 4722, February 7, 1996), and evolutionarily significant units (ESUs) (for a policy statement, see 56 FR 58612, November 20, 1991

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