circumstances. We will not be able to finalize the May 2018 IFC within the required 3-year timeline for publication (by May 11, 2021) for the following reasons:

In the November 4, 2020 **Federal Register** (85 FR 70358), we published a proposed rule titled ''Medicare Program; Durable Medical Equipment, Prosthetics, Orthotics, and Supplies (DMEPOS) Policy Issues and Level II of the Healthcare Common Procedure Coding System (HCPCS)'' (hereinafter DMEPOS and HCPCS proposed rule). In the DMEPOS and HCPCS proposed rule (85 70373), we stated that we solicited comments on the 2018 Interim Final Rule, but because we have not yet responded to the comments we received, we are signaling our intent to do so in the final rule.

On January 20, 2021, the Assistant to the President and Chief of Staff issued a memorandum concerning ''Regulatory Freeze Pending Review'' (''Regulatory Freeze memorandum'').[1] The Office of Management and Budget (OMB) issued Memorandum M–21–14 on January 20, 2021, providing guidance on implementing the Regulatory Freeze memorandum.[2] The Regulatory Freeze memorandum seeks to ensure that the President's appointees or designees have the opportunity to review any new or pending rules. Paragraph 1 of the Regulatory Freeze memorandum directs agencies, subject to any exceptions the Director of the OMB allows for emergency situations or other urgent circumstances relating to health, safety, environmental, financial, or national security matters, or otherwise, to propose or issue no rule in any manner—including by sending a rule to the Office of the Federal Register—until a department or agency head appointed or designated by the President after noon on January 20, 2021, reviews and approves the rule. Additionally, paragraph 3 of the Regulatory Freeze memorandum describes the agency option to temporarily postpone agency rules to permit review by an agency head appointed or designated by the President after noon on January 20, 2021.

In light of our efforts to comply with the Regulatory Freeze memorandum, and to allow policy officials in the new administration the opportunity to review the DMEPOS and HCPCS proposed rule and May 2018 IFC, we do not believe we will have sufficient time to finalize the IFC, and relatedly the DMEPOS and HCPCS proposed rule, by the May 11, 2021 deadline. As a result of these exceptional circumstances, we are issuing this notification of continuation and extending the timeline for finalizing the May 2018 IFC by 1 year. This extension will grant policy officials the opportunity to review the DMEPOS and HCPCS proposed rule and the May 2018 IFC. In accordance with section 1871(a)(3)(C) of the Act, this notification of continuation also ensures that the May 2018 IFC continues in effect beyond May 11, 2021. As a result of the publication of this notification of continuation, the timeline for publication of the final rule will be treated as having been extended until May 11, 2022.

[1] *https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/20/regulatory-freeze-pending-review/* (86 FR 7424, January 28, 2021).

[2] *https://www.whitehouse.gov/wp-content/uploads/2021/01/M-21-14-Regulatory-Review.pdf.*

Dated: April 21, 2021.

Wilma Robinson,

Deputy Executive Secretary to the Department, Department of Health and Human Services.

[FR Doc. 2021–08661 Filed 4–23–21; 8:45 am]

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DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS–HQ–ES–2017–0047; FF09E22000 FXES11180900000 212]

RIN 1018–BC83

Endangered and Threatened Wildlife and Plants; Listing the Yangtze Sturgeon as an Endangered Species

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), determine endangered species status under the Endangered Species Act of 1973 (Act), as amended, for the Yangtze sturgeon (*Acipenser dabryanus*). Loss of individuals due to overharvesting on the Yangtze River is the main factor that contributed to the historical decline of the species. Despite conservation efforts, this species is still currently in decline, due primarily to the effects of dams and bycatch. This rule adds the Yangtze sturgeon to the List of Endangered and Threatened Wildlife.

DATES: This rule is effective May 26, 2021.

ADDRESSES: Comments and materials received, as well as supporting documentation used in the preparation of this rule, are available for public inspection at *http://www.regulations.gov* under Docket No. FWS–HQ–ES–2017–0047.

FOR FURTHER INFORMATION CONTACT: Maricela Constantino, Acting Chief, Branch of Delisting and Foreign Species, Ecological Services Program, U.S. Fish and Wildlife Service, 5275 Leesburg Pike, MS: ES, Falls Church, VA 22041; telephone 703–358–2171. If you use a telecommunications device for the deaf (TDD), call the Federal Relay Service at 800–877–8339.

SUPPLEMENTARY INFORMATION:

Previous Federal Actions

On December 27, 2017, we published in the **Federal Register** (82 FR 61230) a 12-month finding and proposed rule to list the Yangtze sturgeon (*Acipenser dabryanus*) as an endangered species under the Act. A thorough review of the taxonomy, life history, ecology, and overall viability of the Yangtze sturgeon is also presented in the species status assessment (SSA) for the Yangtze sturgeon (Service 2017; available at *http://www.regulations.gov* at Docket No. FWS–HQ–ES–2017–0047), and a summary of this information, including the history of previous federal actions, a summary of the species' description, taxonomy, biology, life history, habitat, distribution, and historical and current population, is provided in our December 27, 2017, proposed rule (82 FR 61230).

Summary of Changes From the Proposed Rule

We received one comment from a peer reviewer providing additional information regarding ongoing and new conservation efforts on the Yangtze River, which include lengthening fishing bans within the species' range and the commencement of restocking efforts on reaches below Gezhouba Dam. We have incorporated this information into this rule and have updated our species status assessment (SSA) report.

Supporting Documents

A species status assessment team prepared an SSA report for the Yangtze sturgeon. The SSA team was composed of Service biologists, in consultation with other species experts. The SSA report represents a compilation of the best scientific and commercial data available concerning the status of the species, including the impacts of past, present, and future factors (both negative and beneficial) affecting the species.

In accordance with our joint policy on peer review published in the **Federal Register** on July 1, 1994 (59 FR 34270), and our August 22, 2016, memorandum updating and clarifying the role of peer review of listing actions under the Act, we sought peer review of the SSA report. The Service sent the SSA report to six independent peer reviewers and received two responses. The purpose of peer review is to ensure that our listing determinations are based on scientifically sound data, assumptions, and analyses. The peer reviewers have expertise in the biology, habitat, and threats to the species.

Background

Presented below is a brief summary of the species' description, life history, distribution, and historical and current population. A more detailed examination of the information can be found in our SSA and proposed rule (Service 2017, entire; 82 FR 61230, December 27, 2017).

Species Description

The Yangtze sturgeon is a freshwater fish species that attains a maximum size of around 130 centimeters (4.3 feet (ft)) and a maximum weight of about 16 kilograms (35 pounds) (Billiard and Lecointre 2000, p. 368; Zhuang *et al.* 1997, pp. 257, 259). The species has a triangular head, an elongated snout, and large blowholes (Gao *et al.* 2009b, p. 117). Yangtze sturgeons have tactile barbels at the front of their mouths that they use to dig for food. On the dorsal side, Yangtze sturgeons are dark gray, brownish-gray, or yellow-gray in color. The rest of the body is milky white in color (Zhuang *et al.* 1997, p. 259).

Life History

Although the Yangtze sturgeon's life history is similar to other sturgeon species, there are key differences. Based on the best available information, much of what is known about the Yangtze sturgeon's life history comes from research on the more numerous and studied Chinese sturgeon due to similarities in morphology, taxonomy, and life history between the two species. Yangtze sturgeons spawn in the spring from March to April, with a smaller late fall/early winter spawning period occurring from October to December (Qiwei 2010, p. 3; Gao *et al.* 2009b, p. 117; Kynard *et al.* 2003, p. 28). Spawning migration begins when water level, flow velocity, and silt content enters a downward trend (Zhang H. *et al.* 2012, p. 4).

Juvenile sturgeons disperse around 100 to 200 kilometers (km) (62 to 124 miles (mi)) downstream from their spawning ground and arrive in backwater pools and sandy shallows with low velocity flow and rich mud and sand substrate where they feed on insects, aquatic plants, and small fish (Zhang *et al.* 2011, p. 184; Zhuang *et al.* 1997, p. 259). During the spring flood on the main stem of the Yangtze River, juveniles will move to the tributaries to feed. Young sturgeons will remain in these feeding reaches until they reach maturity (4 to 6 years for males and 6 to 8 years for females) after which they begin migrating upstream towards the spawning ground during the spring flood (Zhuang *et al.* 1997, p. 261).

Historical Range

As its name implies, the Yangtze sturgeon is found in the Yangtze River (Wu *et al.* 2014, p. 5). The river is more than 6,397 km (3,975 mi) in length and is divided into three segments. The upper reach, which spans a total of about 4,300 km (2,671 mi), is further sub-divided into two segments: The Jinsha River segment, which stretches from the headwater in Yushu in the Tibetan Plateau to Yibin, a distance of about 2,300 km (1,429 mi), and the upper Yangtze River, which stretches from Yibin to the Three Gorges region at Yichang, a distance of about 1,000 km (621 mi) (Cheng *et al.* 2015, p. 571; Jiang *et al.* 2008, p. 1471; Fu *et al.* 2003, p. 1651). The middle reach is from Yichang to Hukou, a distance of about 950 km (590 mi). The Yangtze River widens in this segment and is identified by multiple large lakes, including Lake Dongting and Lake Poyang. The lower reach stretches from Hukou to the mouth of the river at Shanghai, a distance of about 930 km (577 mi) (Fu *et al.* 2003, p. 1651).

Historically, the Yangtze sturgeon was found in the lower portion of the Jinsha River and the upper, middle, and lower reaches of the Yangtze River, a distance of about 1,300 km (807 mi) (Wu *et al.* 2014, p. 5). The majority of historical sightings occurred in the lower Jinsha and upper Yangtze River with occasional sightings in the middle and lower Yangtze (Zhuang *et al.* 1997, p. 259). The species has also been found in major tributaries that feed into the upper Yangtze including the Min, Tuo, and Jialing (Artyukhin *et al.* 2007, p. 370). There have also been sightings of the species in Dongting Lake and Poyang Lake in the middle and lower reaches, respectively (Zhuang *et al.* 1997, p. 259). One sighting took place as far downstream as Anhui province, a distance of more than 2,000 km (1,242 mi) downstream from Yibin (Zhuang *et al.* 1997, p. 261). The species' spawning reach is understood by Yangtze sturgeon researchers to have occurred from Maoshui in the lower Jinsha River to Hejiang in the upper Yangtze River (Zhang *et al.* 2011, p. 184).

Current Range

The Yangtze sturgeon's current range has been reduced to the upper Yangtze River and its tributaries in the reaches between Yibin and Yichang, a distance of about 1,000 km (621 miles) (Wu *et al.* 2014, p. 5; Dudgeon 2010, p. 128; Huang *et al.* 2011, p. 575; Zhang *et al.* 2011, p. 181; Artyukhin *et al.* 2007, p. 370). The completion of the Gezhouba Dam in 1981 at Yichang prevented the upstream migration of adults to the species' spawning ground (Zhuang *et al.* 1997, p. 261). As a result of the construction of Gezhouba Dam, the species may have been extirpated in reaches below the dam (Li *et al.* 2015, p. 186; Zhu *et al.* 2008, p. 30). That said, from 2014–2017, fishermen below Gezhouba Dam accidentally captured four adult Yangtze sturgeons, suggesting the presence of a very small remnant population (Du 2017, pers. comm.). The construction of the Three Gorges Dam and its reservoir, which began in 2003 and was completed in 2009, further reduced the species' range by modifying reaches above Three Gorges Dam to a lentic (still water) system (Chen D. *et al.* 2009, p. 341; Fu *et al.* 2003, p. 1650). Loss of lotic (rapidly moving water) ecosystem reduces the quality of remaining habitat for the species (Kynard 2016, pers. comm.; Cheng *et al.* 2015, pp. 570, 576). On the lower Jinsha River, in the upstream portion of the species' historical range, the construction of the Xiangjiaba Dam, which was completed in 2008, limited the species' spawning ground to areas below the dam (Zhang *et al.* 2011, pp. 183–184). The species continues to ascend the major tributaries in the upper Yangtze, including the Min, Tuo, and Jialing River (Huang *et al.* 2011, p. 575; Artyukhin *et al.* 2007, p. 370).

Historical and Current Population

The Yangtze sturgeon was historically abundant and was commercially harvested up to the 1970s (Lu *et al.* 2015, p. 89; Zhang *et al.* 2013, p. 409; Kynard *et al.* 2003, p. 27). The majority (80 percent) of harvest of Yangtze sturgeon took place during the 1950s to the 1970s. However, overharvesting during this time period led to a sharp decline in the population size (Kynard *et al.* 2003, p. 27).

While there may have been natural recruitment of the species in the 1990s, no natural recruitment has been observed in the wild since the 2000s (Du *et al.* 2014, p. 1; Wu *et al.* 2014, p. 1). The population is currently being repopulated by artificial restocking. Between the years of 2010–2013, 7,030 Yangtze sturgeon juveniles were released into the middle and upper Yangtze River in two to three batches each year (Wu *et al.* 2014, p. 3). Restocking efforts have been ongoing in the reaches below Gezhouba Dam since 2014 (Hu 2017, pers. comm.). However, restocked sturgeons suffer from low fitness; most notably, they lack the ability to survive to reproductive age. Capture data obtained from the releases in 2010–2013 found that 95 days after restocking, no restocked sturgeons were caught either by researchers or by fishermen in the upper Yangtze River (Wu *et al.* 2014, pp. 3–5). These results indicate that restocked sturgeon have a very low survival rate. Although we do not have population estimates for the species, based on the fact that there has been no observable natural reproduction since the 2000s and the low survival rate of restocked sturgeon, the species' population in the Yangtze River is likely to be very low when compared to historical numbers (Du *et al.* 2014, p. 1; Wu *et al.* 2014, p. 4).

Regulatory and Analytical Framework

Regulatory Framework

Section 4 of the Act (16 U.S.C. 1533) and its implementing regulations (50 CFR part 424) set forth the procedures for determining whether a species is an endangered species or a threatened species. The Act defines an ''endangered species'' as a species that is in danger of extinction throughout all or a significant portion of its range, and a ''threatened species'' as a species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. The Act requires that we determine whether any species is an ''endangered species'' or a ''threatened species'' because of any of the following factors:

(A) The present or threatened destruction, modification, or curtailment of its habitat or range;

(B) Overutilization for commercial, recreational, scientific, or educational purposes;

(C) Disease or predation;

(D) The inadequacy of existing regulatory mechanisms; or

(E) Other natural or manmade factors affecting its continued existence.

These factors represent broad categories of natural or human-caused actions or conditions that could have an effect on a species' continued existence. In evaluating these actions and conditions, we look for those that may have a negative effect on individuals of the species, as well as other actions or conditions that may ameliorate any negative effects or may have positive effects.

We use the term ''threat'' to refer in general to actions or conditions that are known to or are reasonably likely to negatively affect individuals of a species. The term ''threat'' includes actions or conditions that have a direct impact on individuals (direct impacts), as well as those that affect individuals through alteration of their habitat or required resources (stressors). The term ''threat'' may encompass—either together or separately—the source of the action or condition or the action or condition itself.

However, the mere identification of any threat(s) does not necessarily mean that the species meets the statutory definition of an ''endangered species'' or a ''threatened species.'' In determining whether a species meets either definition, we must evaluate all identified threats by considering the expected response by the species, and the effects of the threats—in light of those actions and conditions that will ameliorate the threats—on an individual, population, and species level. We evaluate each threat and its expected effects on the species, then analyze the cumulative effect of all of the threats on the species as a whole. We also consider the cumulative effect of the threats in light of those actions and conditions that will have positive effects on the species, such as any existing regulatory mechanisms or conservation efforts. The Secretary determines whether the species meets the definition of an ''endangered species'' or a ''threatened species'' only after conducting this cumulative analysis and describing the expected effect on the species now and in the foreseeable future.

The Act does not define the term ''foreseeable future,'' which appears in the statutory definition of ''threatened species.'' Our implementing regulations at 50 CFR 424.11(d) set forth a framework for evaluating the foreseeable future on a case-by-case basis. The term foreseeable future extends only so far into the future as the Services can reasonably determine that both the future threats and the species' responses to those threats are likely. In other words, the foreseeable future is the period of time in which we can make reliable predictions. ''Reliable'' does not mean ''certain''; it means sufficient to provide a reasonable degree of confidence in the prediction. Thus, a prediction is reliable if it is reasonable to depend on it when making decisions.

It is not always possible or necessary to define foreseeable future as a particular number of years. Analysis of the foreseeable future uses the best scientific and commercial data available and should consider the timeframes applicable to the relevant threats and to the species' likely responses to those threats in view of its life-history characteristics. Data that are typically relevant to assessing the species' biological response include species-specific factors such as lifespan, reproductive rates or productivity, certain behaviors, and other demographic factors.

Our proposed rule described ''foreseeable future'' as the extent to which we can reasonably rely on predictions about the future in making determinations about the future conservation status of the species. The Service since codified its understanding of foreseeable future at 50 CFR 424.11(d) (84 FR 45020, August 27, 2019). In those regulations, we explain the term ''foreseeable future'' extends only so far into the future as the Service can reasonably determine that both the future threats and the species' responses to those threats are likely. The Service will describe the foreseeable future on a case-by-case basis, using the best available data and taking into account considerations such as the species' life-history characteristics, threat-projection timeframes, and environmental variability. The Service need not identify the foreseeable future in terms of a specific period of time. These regulations did not significantly modify the Service's interpretation; rather they codified a framework that sets forth how the Service will determine what constitutes the foreseeable future based on our long-standing practice. Accordingly, although these regulations do not apply to the final rule for the Yangtze sturgeon because it was proposed prior to their effective date, they do not change the Service's assessment of foreseeable future for the Yangtze sturgeon as contained in our proposed rule and in this final rule.

Analytical Framework

The SSA report documents the results of our comprehensive biological status review for the species, including an assessment of the potential threats to the species. The SSA report does not represent a decision by the Service on whether the species should be listed as an endangered or threatened species under the Act. It does, however, provide the scientific basis that informs our regulatory decisions, which involve the further application of standards within the Act and its implementing regulations and policies. The following is a summary of the key results and conclusions from the SSA report; the full SSA report can be found at Docket FWS–HQ–ES–2017–0047 on *http://www.regulations.gov.*

To assess Yangtze sturgeon viability, we used the three conservation biology principles of resiliency, redundancy, and representation (Shaffer and Stein 2000, pp. 306–310). Briefly, resiliency supports the ability of the species to withstand environmental and demographic stochasticity (for example, wet or dry, warm or cold years), redundancy supports the ability of the species to withstand catastrophic events (for example, droughts, large pollution events), and representation supports the ability of the species to adapt over time to long-term changes in the environment (for example, climate changes). In general, the more resilient and redundant a species is and the more representation it has, the more likely it is to sustain populations over time, even under changing environmental conditions. Using these principles, we identified the species' ecological requirements for survival and reproduction at the individual, population, and species levels, and described the beneficial and risk factors influencing the species' viability.

The SSA process can be categorized into three sequential stages. During the first stage, we evaluated the individual species' life-history needs. The next stage involved an assessment of the historical and current condition of the species' demographics and habitat characteristics, including an explanation of how the species arrived at its current condition. The final stage of the SSA involved making predictions about the species' responses to positive and negative environmental and anthropogenic influences. This process used the best available information to characterize viability as the ability of a species to sustain populations in the wild over time. We use this information to inform our regulatory decision.

Summary of Biological Status and Threats

Below, we review the biological condition of the species and its resources, and the threats that influence the species' current and future condition, in order to assess the species' overall viability and the risks to that viability.

Dams on the Yangtze River and Their Effects

The topography of the upper Yangtze River basin is characterized by mountains of varying heights. The change in elevation between the upper Yangtze to the lower Yangtze amounts to 3,280 meters (m) (10,761 feet (ft)), which makes the upper Yangtze River an ideal place for hydroelectric projects (Fan *et al.* 2006, p. 33). The growth of dam construction in China has accelerated during the past decades. From the 1970s to the 1990s, an average of 4.4 large reservoirs (capacity greater than 0.1 kilometers^3 (km^3)) were constructed per year. By the 2000s, this number had increased to an average construction rate of 11.8 large reservoirs per year. By 2011, China possessed 552 large reservoirs, 3,269 medium reservoirs (capacity of 0.01–0.1 km^3), and 84,052 small reservoirs (capacity of 0.0001–0.01 km^3); of this number, the Yangtze River basin contained 45,000 dams and reservoirs, including 143 dams having large reservoirs, or a quarter of all large reservoirs in China (Miao *et al.* 2015, p. 2350; Mueller *et al.* 2008, p. 233). The construction of dams and reservoirs have multiple and broad effects on the Yangtze sturgeon and its habitat, including limiting connectivity between spawning and feeding reaches; altering water temperature, water discharge, and velocity rates; and changing sediment concentration.

Connectivity

Dam construction on Yangtze River limits the ability of the Yangtze sturgeon to migrate between spawning and feeding reaches. Dam construction on the Yangtze occurs on both the upstream and downstream portion of the species' current range. In the middle Yangtze River, the construction of Gezhouba Dam in 1981 prevented adults downstream of the dam from being able to migrate to the species' spawning ground in the upper Yangtze near Yibin (Miao *et al.* 2015, p. 2351; Dudgeon 2010, p. 128; Fang *et al.* 2006, p. 375; Zhuang *et al.* 1997, p. 261). Although the reaches below Gezhouba Dam might be suitable for the species, at present there has been no observed natural reproduction below Gezhouba Dam (Du 2017, pers. comm.). In addition to Gezhouba Dam, the construction of the Three Gorges Dam in 2003 created a reservoir that affected individuals of the species upstream. The Three Gorges Dam reservoir, which extends 600 km upstream from the dam, transformed the area into unsuitable habitat for Yangtze sturgeon (Kynard 2016, pers. comm.; Cheng *et al.* 2015, p. 570; Miao *et al.* 2015, p. 2351). As a result of the construction of the reservoir, the species now rarely swims downstream to reaches below Chongqing. The result is the species' current range is concentrated in the 500-km reach between the Yibin and Chongqing (Wu *et al.* 2015, p. 5).

Meanwhile, in the upstream portion of the species' range, the construction of Xiangjiaba Dam on the lower Jinsha River segment occurred on part of the historical spawning reach of the Yangtze sturgeon. Xiangjiaba Dam is a barrier to all fish species and prevents migration to areas above or below the dam (Wu *et al.* 2014, p. 2). However, the species may be able to use spawning reaches below the dam (Fan *et al.* 2006, p. 36). That said, a dam located upstream from the species' habitat affects the species downstream by altering water temperature and sedimentation rate, which we discuss below (Fan *et al.* 2006, p. 36).

In addition to dams currently present on the lower Jinsha and upper Yangtze River, in the early 2000s, a proposal was presented for the construction of the Xiaonanhai Dam, which would be located upstream from Chongqing. If built, this dam would create a barrier between the species' last known spawning ground and feeding reach, which, depending on design, could have a significant negative impact on the species (Cheng *et al.* 2015, p. 579). However, at present, China's Ministry of Environmental Protection has rejected the proposal and any future dam projects on the last stretch of free-flowing Yangtze River due to environmental impacts (Chang 2016, pers. comm.; Kynard 2016, pers. comm.; Mang 2015, unpaginated).

While the rejection of the proposal to construct the Xiaonanhai Dam will allow continued connectivity between the spawning and feeding reach for the Yangtze sturgeon, the country's twelfth 5-year plan stated that renewable resources should make up 15 percent of all energy generated in China with 9 percent coming from hydroelectric sources. This plan translates to an additional 230 gigawatts (GW) of power generated via hydroelectric dams. This target is a very ambitious one, given that Three Gorges Dam generates 18 GW of power per year (Dudgeon 2011, p. 1496). Furthermore, although the plan to construct the Xiaonanhai Dam has been rejected, plans to construct dams on the Jinsha River as part of a 12-dam cascade are still proceeding (Dudgeon 2010, p. 129).

Water Temperature

Dams negatively affect the reproductive success of Yangtze sturgeon by altering water temperature flowing through the species' habitat. Water temperature influences the reproductive success of the Yangtze sturgeon at two stages in its life cycle: Commencement of spawning migration and egg survival. Spawning migration of the Yangtze sturgeon will not start until the water temperature reaches 18 degrees Celsius (°C) (64.4 degrees Fahrenheit (°F)) (Cheng *et al.* 2015, p. 578). Historically, before the construction of the Xiangjiaba and other dams on the lower Jinsha, the water temperature reached 18 °C (64.4 °F) around April. However, the construction of the dams stratified the water table. As most dams on the Yangtze are designed to release cold water located at the bottom of the dams, the spawning season for the Yangtze sturgeon could be delayed by more than a month (Deng *et al.* 2006 and Wang *et al.* 2009, as cited in Cheng *et al.* 2015, p. 578). This delay shortens the maturing season for juveniles and is likely to reduce the species' survival rate. Additionally, if the water remains too cold for too long, sturgeon eggs will not mature, resulting in total loss of reproduction for that season (Kynard 2016, pers. comm.).

Water Discharge and Velocity

By altering discharge rates, dams affect the Yangtze sturgeon's reproductive success by affecting the timing of spawning migration. The species' spawning migration begins when flow rate increases during the spring flood (Zhuang *et al.* 1997, p. 261). At Yichang, the most downstream portion of the Yangtze sturgeon's current range, the mean discharge rate from 1983 to 2004 (before the construction of Three Gorges Dam) was between 10,000 m^3 per second (/s) and 17,000 m^3/s. After the construction of the Three Gorges Dam, mean flow rate varies between 6,414 m^3/s in low flow years to 12,780 m^3/s in high flow years (Chen and Wu 2011, p. 384). For Chinese sturgeon, successful spawning occurs when water discharge is between 7,000 and 26,000 m^3/s. This means that although the flow rate during high flow years remains in the optimal discharge rate for Chinese sturgeon spawning, discharge rates during low flow years are below the flows needed for spawning, and thus are likely to have a negative impact on spawning success rates (Chen and Wu 2011, p. 385). Given the similarities in the genetic and life history between the Yangtze and Chinese sturgeon, the reduction in discharge rate is likely to negatively affect the spawning success rate of the Yangtze sturgeon on reaches below the Three Gorges Dam as well.

While we do not have long-term historical data for the optimal water discharge rate for the Yangtze sturgeon at Yibin, the flow rate at Chongqing during the years 1950–2000 was between 4,540 m^3/s and 11,000 m^3/s (Zhang *et al.* 2011, p. 183). Since Chongqing is farther upstream from Yichang, this flow rate may be the river's natural rate at this section of the Yangtze. However, following the impoundment by the Xiangjiaba Dam in October 2012 and the Xiluodo Dam in May 2013, discharge in the lower Jinsha has declined more than 50 percent, suggesting that the current flow rate is likely to be lower than the flow rate between 1950 and 2000 (Cheng *et al.* 2015, p. 577). The Jinsha River feeds into the upper Yangtze River. This means that a reduction in flow rate on the Jinsha will also reduce the flow rate on the upper Yangtze River. Given that the Yangtze sturgeon is closely related to the Chinese sturgeon, a reduction of flow rate by over 50 percent could have a significant negative impact on the reproductive success rate of the Yangtze sturgeon given its already tenuous biological status.

Sedimentation Concentration

In addition to affecting spawning of Yangtze sturgeon, dams affect the condition of the species' spawning ground through changes in the water velocity and sedimentation load. Because reproductive success of sturgeon is tied to the amount of suitable habitat, a reduction in habitat area can reduce the reproductive success of the species (Ban *et al.* 2011, p. 96; Bemis and Kynard 1997, p. 169). Specifically, flow rates affect the Yangtze sturgeon by affecting the sedimentation concentration in the water and on the riverbed. As noted before, Yangtze sturgeon lay their eggs on the interstitial spaces between rocks and boulders. The makeup of the riverbed needs to contain the right concentration of small pebbles and larger boulders to provide sufficient space for adherence and aeration of the eggs (Du *et al.* 2011, pp. 261–262; Bemis and Kynard 1997, p. 169).

Historically, discharge rates and sedimentation load were aligned with precipitation rates: A low discharge rate results in a low sedimentation load, while high discharge rates lead to a higher sediment load, as high flows are able to transport more sediments downstream (Chen Z. *et al.* 2001, pp. 88–89). However, with dams constructed along the lower Jinsha and Yangtze Rivers, discharge rate and sedimentation rate have become misaligned. While discharge rates typically remain aligned with the precipitation rate, the sedimentation load pattern displays a 2-month delay due to sediment being trapped behind the dams. When the spring flood occurs, numerous dams release highly concentrated sediment downstream all at once, resulting in an asymmetrical sediment load pattern (Chen Z. *et al.* 2001, p. 90). The effects of sediment load patterns on the species' habitat occur at two stages: Release of sediments during high river stages and reduced sediment size and load over time (Dudgeon 2011, pp. 1488, 1495).

The Jinsha River dams trap up to 82 percent of the sediment during the winter months, resulting in ''clean'' (*i.e.,* sediment-free) water flowing downstream. This ''clean'' water lacks nutrients and may decrease the food supply for the Yangtze sturgeon over the winter months (Cheng *et al.* 2015, p. 578). During the subsequent spring flood, the release of concentrated sediment from dams likely results in sediment filling in all the interstitial spaces in the spawning habitat, thereby reducing available spawning habitat for that season.

Despite the spring release of concentrated sediments, sediment load is expected to decline over time. At Yichang, sediment load per year has decreased from 530 Megatonnes (Mt) (530 million metric tons) per year in the 1950s–1960s, to 60 Mt (60 million metric tons) per year after 2003. Additionally, suspended sediment at Yichang below Three Gorges Dam has decreased in size from 8–10 micrometers in 1987–2002 to 3 micrometers after 2003 (Yang *et al.* 2011, pp. 16–17). Reduction in sediment size can lead to increased embeddedness of available interstitial space, which prevents the adherence of eggs to the river bottom and reduces the quality of remaining spawning habitats. At the reaches below Gezhouba Dam, sedimentation has reduced available interstitial space by as much as 50 to 70 percent (Du *et al.* 2011, p. 262).

Summary of Effects of Dams on the Yangtze Sturgeon

Dam construction in the middle Yangtze and lower Jinsha has restricted the species' range to the reaches of the Yangtze between Yibin and Yichang (Wu *et al.* 2014, p. 5). These projects prevented the migration of the species upstream and downstream of the dams. Although there is currently access between the species' remaining spawning and feeding grounds, the condition of the remaining habitat is likely to be negatively affected by changes to the river flow and sedimentation rate. The formation of the Three Gorges reservoir has transformed the 600-km reach above the dam into a lentic (still water) system, resulting in unsuitable habitat for the species (Kynard 2016, pers. comm.; Cheng *et al.*

2015, pp. 570, 576). As a result, Yangtze sturgeon rarely use habitat downstream from Chongqing (Wu *et al.* 2014, p. 5).

Upstream from the species' current range, the construction of the Xiluodu and Xiangjiaba Dams are likely to negatively affect the reproductive success of the Yangtze sturgeon. Through the release of cold water during the spring flood, the dam can delay the spawning migration of the sturgeon, which will shorten the maturation time for juveniles and possibly prevent the successful maturation of eggs altogether (Kynard 2016, pers. comm.; Cheng *et al.* 2015, p. 578). Alteration to sediment concentration in both the short term and long term reduces the quality of remaining habitat (Du *et al.* 2011, p. 262). Given the lack of observed natural reproduction of the species in the upper Yangtze, present and future dam construction could significantly affect the viability of the species.

Overfishing (Historical) and Bycatch (Current)

Historically, the Yangtze sturgeon was commercially harvested on the Yangtze River. In the 1970s, 5,000 kilograms (5.5 tons) of Yangtze sturgeons were caught in the spring season at Yibin (Zhuang *et al.* 1997, p. 262). Since then, however, the population of Yangtze sturgeon has declined significantly (Zhang *et al.* 2013, p. 409). There are multiple reasons for this decline: Fishermen use fine mesh nets that prevent smaller fish, weighing as little as 50 grams (1.7 ounces), from being able to escape; the number of fishing boats in the Yangtze River increased from 500 in the 1950s to 2,000 by 1985; and more than 140,000 fishermen currently depend on the river for a living. Furthermore, the fishing season historically overlapped with the main spawning season of the Yangtze sturgeon (Yi 2016, p. 1; Fan *et al.* 2006, p. 37; Zhuang *et al.* 1997, p. 262). The replacement of bamboo and reed gear with gear made from synthetic fibers further contributed to a higher catch rate of sturgeons (Chen D. *et al.* 2009, p. 346).

Despite attempts to help conserve the species by restocking, restocked juveniles experience very low survival rates (Wu *et al.* 2014, p. 4). From 2010 to 2013, restocking operations released 7,030 juveniles into the upper Yangtze River main stem. Subsequent bycatch between 2010 and 2013 recorded a total of 112 sturgeons caught, indicating a very low survival rate of stocked juveniles (Wu *et al.* 2014, p. 3). These results suggest that although other factors also played a role in low survival rate of juveniles, the existing bycatch rate continues to put pressure on the survival of the species (Wu 2016, pers. comm.; Wu *et al.* 2014, p. 4).

Riverbed Modification

To reproduce successfully, the Yangtze sturgeon requires the river substrate to contain a suitable concentration of sediment (Du *et al.* 2011, p. 257). Alteration of the riverbed has reduced the reproductive success of this species. To improve navigation on the lower Jinsha and upper Yangtze River, multiple projects, including sand and gravel extraction operations, were implemented on the reaches between Shuifu and Yibin, and Yibin and Chongqing (Zhang *et al.* 2011, p. 184). Between 2005 and 2009, $44 million (converted to U.S. dollars) were invested to improve the navigation between Yibin and Chongqing. These investments have led to the modification of 22 riffles (a shallow section of a stream or river with rapid current and a surface broken by gravel, rubble, or boulders) on the upper Yangtze and the deepening of the channel from 1.8 m (5.9 ft) to 2.7 m (8.8 ft) (Zhang *et al.* 2011, p. 184). Additionally, up to 10, 6, and 3 river dredge ships operate in the Yangtze River, the Jinsha River, and the Min River, respectively. The operations of these ships alter the bottom topography of the riverbeds, which results in the loss of benthic (bottom-dwelling) habitat and spawning ground for many fish species, including the Yangtze sturgeon (Fan *et al.* 2006, p. 37). These projects are occurring on or near current Yangtze sturgeon spawning and feeding grounds from Yibin to Hejiang. Thus, these operations will continue to reduce the quality and quantity of remaining habitat (Zhang *et al.* 2011, p. 184).

Industrial Pollution

As a benthic predator, the Yangtze sturgeon is exposed to higher concentrations of industrial pollution than many other fish species (Yujun *et al.* 2008, pp. 341–342). While we are not aware of any studies that analyze the impacts of industrial pollution on Yangtze sturgeon specifically, there have been studies on Chinese sturgeon and other sturgeon species. Industrial pollutants such as triphenyltin (TPT) affect the reproductive success of the Chinese sturgeon. TPT, used in paint on ship hulls and in fishnets in China, can be absorbed into the eggs of Chinese sturgeon, resulting in increased deformities, including abnormal development and skeletal and morphological deformities in embryos (Hu *et al.* 2009, pp. 9339–9340).

A study on TPT exposure to 2- to 3-day-old Chinese sturgeon larvae found that 6.3 percent showed skeletal/morphological deformities and 1.2 percent had no eyes or only one eye. At the same time, larvae from spawning hatches of captured adults showed skeletal/morphological deformities of 3.9 percent and 1.7 percent that had only one eye or no eyes. Given the rate of deformities found in this study, reproduction in the studied Chinese sturgeon was reduced by 58.4 to 75.9 percent (Hu *et al.* 2009, p. 9342). Because the Yangtze and Chinese sturgeon are closely related species, the presence of TPT in the upper Yangtze River is likely reducing the reproductive success of the Yangtze sturgeon at a similar rate.

In addition to TPT, the presence of endocrine disruptor compounds (EDC) affects Chinese sturgeon by inducing declining sperm activity, intersex testis-ova, and a decline in the male to female ratio in the population (An and Hu 2006, p. 381). A study on EDC found that the concentration of EDC in the Yangtze River from industrial discharge (1.55 to 6.85 micrograms per liter) is very high and could have a detrimental impact on sturgeon in the river.

As a result of rapid industrialization along the Yangtze River, higher concentrations of heavy metals are found in the river (Yujun *et al.* 2008, p. 338). A high concentration of heavy metals leads to greater accumulation of these metals in all aquatic organisms (Yujun *et al.* 2008, p. 339). The toxicity effect of heavy metal accumulation is especially pronounced in zoobenthic predators, like the Yangtze sturgeon, because they occupy a higher position in the food chain. The result is that by consuming smaller prey species that have absorbed heavy metal, zoobenthic predators accumulate heavy metals inside their bodies (Yujun *et al.* 2008, p. 346). Given that the heavy metal concentration is highest in benthic animals, especially zoobenthic predators like the sturgeon, the effect of heavy metals on the sturgeon could be more pronounced than in other aquatic species (Yujun *et al.* 2007, p. 341; An and Hu 2006, p. 381). Despite the known impacts on captured Chinese sturgeon, we currently do not have evidence of population-level impacts of EDC or heavy metals on the wild Yangtze sturgeon population. That said, even though we have no evidence of morphological deformities in wild sturgeon, it is likely that industrial pollution does have an effect on the reproductive success of wild sturgeon.

Hybridization With Displaced Native and Nonnative Sturgeon

Despite the decline in wild fishery yields, the Yangtze basin remains one of the major centers of China's aquaculture industry. Fishery yields from the basin account for 65 percent of total freshwater fisheries production in China (Shen *et al.* 2014, p. 1547; Chen D. *et al.* 2009, p. 338). In the past 30 years, sturgeon aquaculture in China has risen significantly. Although commercial aquaculture for sturgeon only started in the 1990s, by 2006, production had reached 17,424 tons, which accounts for 80 percent of the world total production (Shen *et al.* 2014, p. 1548). The growth of the aquaculture industry in China saw aquaculture farms constructed across all branches of the Yangtze River (Li R. *et al.* 2009, p. 636). Sturgeon species that are commonly used in the aquaculture industry include the Amur sturgeon (*Acipenser schrenckii*), kaluga (*Huso dauricus*), and other Amur River sturgeon hybrids (Li R. *et al.* 2009, p. 636). However, none of these commonly cultured species is native to the Yangtze River. The existing fishing management regulations are not adequate to address the threat of hybridization, and the regulations that do exist are not enforced. In particular, non-native aquaculture sturgeon and hybridized aquaculture sturgeon are escaping from sturgeon farms into the wider river system (Li R. *et al.* 2009, p. 636). The result is a comingling of native, exotic, and hybrid sturgeon species which could have a negative impact on the Yangtze sturgeon (Shen *et al.* 2014, p. 1549; Li R. *et al.* 2009, p. 636).

Currently, no aquaculture efforts in China use native strains of sturgeon. Because no farms in China focus on raising native stock in large enough numbers, this system creates shortages of parental stock of native sturgeon. In response to this shortage, farmers crossbreed wild-caught sturgeon with any sturgeon species available, including nonnative species (Xiong *et al.* 2015, p. 658; Li R. *et al.* 2009, p. 636). For example, in 2006, there was a shortage of Siberian sturgeon (*Acipenser baerii*) in China. Farmers then started crossbreeding Siberian sturgeon with Russian sturgeon (*A. gueldenstaedtii*), Sterlet sturgeon (*A. ruthenus*), and Amur sturgeon (*A. schrenckii*) (Li R. *et al.* 2009, p. 636). Crossbreeding of sturgeon species in China alters the makeup of the wild population. Of the 221 young sturgeons captured on the Yangtze River in 2006, 153 were hybrids, which accounted for 69.9 percent of total sturgeons caught (Li R. *et al.* 2009, p. 636). This information indicates that farmed hybrids are escaping into the river system. Although this study was conducted in the lower Yangtze River below the range of the Yangtze sturgeon, because sturgeon aquaculture occurs across the Yangtze River system, it is likely that hybridization is occurring in the upper Yangtze River as well.

The uncontrolled hybridization of native and nonnative species on the Yangtze alters the population dynamics between hybrids and native stocks. Hybridization may reduce the fitness of the overall population or replace a population of native fish with hybrids (Shen *et al.* 2014, p. 1549; Li R. *et al.* 2009, p. 636). Hybridization may also result in hybrids with better fitness than wild stock that outcompete the wild native stock of Yangtze sturgeon for habitat and resources. When native fish are unavailable, farmers tend to import nonnative fish that have more desirable characteristics, such as a higher growth rate and better adaptability. These nonnative sturgeons are bred with available native sturgeon to produce hybrids. These hybrids oftentimes escape or are accidentally introduced into the wild and then compete with the Yangtze sturgeon for resources (Xiong *et al.* 2015, pp. 657–658). Although hybridization is likely occurring all along the Yangtze River, we currently do not have information on the rate of hybridization in sturgeon in the upper Yangtze or how significant the effects are on the Yangtze sturgeon. Given that hybridized sturgeons make up 69.9 percent of sturgeons found in the studied area, it is likely that sturgeon hybrids are competing, and will likely continue to compete, with native stocks for habitat and resources throughout the Yangtze River system.

Management Efforts

As a result of overfishing and the construction of Gezhouba Dam in 1981, the population of Yangtze sturgeon has continued to decline (Du *et al.* 2014, p. 1; Wu *et al.* 2014, p. 1; Zhang H. *et al.* 2011, p. 181). In response to the decline of the species, national and local officials have embarked on a number of initiatives to help conserve the species. These initiatives include increasing legal protection for the Yangtze sturgeon, creating and designating part of the species' range as a protected area, and repopulating the species in the wild through restocking (Zhang H. *et al.* 2011, p. 181; Fan *et al.* 2006, p. 35; Wei *et al.* 2004, p. 322).

Legal Protections

In response to the decline of the Yangtze sturgeon, in 1989, China's State Council added the Yangtze sturgeon to the National Red Data Book for Threatened Chinese Fish as a Class I Protected Animal (Wu *et al.* 2014, p. 1; Zhang H. *et al.* 2011, p. 181; Dudgeon 2010, p. 128; Wei *et al.* 2004, p. 322; Zhuang *et al.* 1997, p. 258). Animals listed as a Class I species are protected from certain activities, including hunting, capturing, or killing, for both commercial and personal uses. Scientific research, domestication, breeding, and exhibition are exempted (Wei *et al.* 2004, p. 322). Transportation of Class I-listed species requires approval from the Department of Wildlife Administration. Import or export of Class I aquatic species is regulated by the Fisheries Bureau of the Minister of Agriculture (Wei *et al.* 2004, p. 323).

In addition to its listing under national law, the species has also been included in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) since 1998 (Ludwig 2008, p. 5; CITES 1997, pp. 152–153). A query of the CITES trade database does not show any records of legal international trade in Yangtze sturgeon from 1975 to 2017 (CITES 2019). International trade in CITES species is regulated via a permit system. Under Article IV of CITES, export of an Appendix-II specimen requires a prior grant and presentation of an export permit. Export permits for Appendix-II specimens are only granted if the Management Authority of the State of export is satisfied that the specimens were lawfully obtained and if the Scientific Authority of the State of export has advised that the trade is not detrimental to the survival of the species in the wild. For any living specimen, the Management Authority of the State of export must also be satisfied that the specimen will be so prepared and shipped as to minimize the risk of injury, damage to health, or cruel treatment. Re-export of an Appendix-II specimen requires the prior grant and presentation of a re-export certificate, which is only granted if the Management Authority of the State of re-export is satisfied that the specimen was imported into that State in accordance with CITES and, for any living specimen, that the specimen will be so prepared and shipped as to minimize the risk of injury, damage to health, or cruel treatment. Certain exemptions and other special provisions relating to trade in CITES specimens are also provided in Article VII of CITES. In the United States, CITES is implemented through the Act and regulations at 50 CFR part 23.

Additionally, since 2003, a fishing ban on all fish species has been implemented in the upper Yangtze River from February 1 to April 30. Starting in 2017, the fishing ban was changed and extended from March to June (Du 2017, pers. comm.). One of the effects of this ban is a reduction in the bycatch of Yangtze sturgeon, as the time period of the ban coincides with the spawning season of the Yangtze sturgeon (Chen D. *et al.* 2012, p. 532; Chen D. *et al.* 2009, p. 348).

Despite the implementation of legal protection for the species, the current regulatory mechanisms for the species have several shortcomings. China currently does not have a specialized, dedicated agency to manage fisheries resources across the country. Riverine resource management is maintained at local levels, which are often located in major population centers, far away from the fishery resource (Chen D. *et al.* 2012, p. 541). In the case of Yangtze sturgeon, these different jurisdictions have variations in regulation and conservation goals for the Yangtze River ecosystem, which limits the coordination of species-conservation efforts and the overall effectiveness of managing species conservation across the Yangtze River basin (Chen D. *et al.* 2012, p. 541).

In addition to a lack of a specialized body or other effective basin-wide conservation efforts, lack of funding is a major problem for local jurisdictions. Enforcement officers often lack basic equipment, such as boats, to carry out fishing regulations within the fishery (Chen D. *et al.* 2012, p. 541). Additionally, while commercial harvesting of the species is prohibited, bycatch is still occurring and may still be too high to sustain a wild breeding population (Zhang H. *et al.* 2011, p. 184). The new seasonal fishing ban implemented in 2017 has the potential to reduce bycatch (Du 2017, pers. comm.). However, the positive effects from a fishing ban on the Yangtze River may be limited, given the fact that entire stretches of the river cannot be closed off to fishing due to the importance of the river to the economic well-being of riverside communities (Fan *et al.* 2006, p. 38).

Protected Areas

To offset the effects of habitat loss due to dams, in 2000, China's State Department established the National Reserve of Hejiang-Leibo Reaches of the Yangtze River for Rare and Endangered Fishes (Zhang H. *et al.* 2011, p. 181; Fan *et al.* 2006, p. 35). The reserve is located on the upper Yangtze River on the reaches between Xiangjiaba Dam and the city of Chongqing. This reserve is intended to protect 3 imperiled fish species, the Yangtze sturgeon, the Chinese paddlefish (*Psephurus gladius*), and the Chinese high-fin banded shark (*Myxocyprinus asiaticus*), as well as 37 other endemic fish species (Fan *et al.* 2006, p. 35). In 2005, the reserve was expanded to mitigate the impact from current and future dam constructions (Zhang H. *et al.* 2011, pp. 181–182). While the reserve plays an important role in protecting wildlife within its borders, expansion of the hydroelectric projects in the lower Jinsha River and upper Yangtze outside the protected area is likely to undermine the effectiveness of the reserve. In order to facilitate economic growth, China has decentralized authority for infrastructure development from the state to local municipalities. This decentralized model has resulted in provincial governments prioritizing economic growth over environmental impacts (Dudgeon 2011, p. 1496).

Since 2003, hydroelectric projects in China are subject to environmental assessments and approval from the Ministry of Environmental Protection (Ministry) (Dudgeon 2011, p. 1496). However, this approval is routinely ignored even by nationally owned corporations. For example, in 2004, China Three Gorges Corporation (CTGC) began construction of the Xiluodu Dam in the Lower Jinsha without obtaining permission from the Ministry (Dudgeon 2011, pp. 1496–1497). In response, the Ministry suspended work on the dam in 2005. However, despite initial reservations about the lack of an environmental impact assessment, the Ministry quickly compiled reports and allowed the dam construction to proceed (Dudgeon 2011, p. 1499). Additionally, in 2009, the Ministry gave the authority to build two additional dams on the Jinsha segment after a brief suspension (Dudgeon 2010, p. 129). Overall, these temporary suspensions of construction have done little to slow down the pace of dam development. In addition to dam construction occurring outside the reserve, there was also a case of dam construction occurring within the reserve. In 2011, CTGC began constructing the Xiangjiaba Dam on the Lower Jinsha. The location of this dam was within the 500-km boundary of the National Reserve of Hejiang-Leibo Reaches. The CTGC successfully petitioned the State Council to redraw the boundaries of the reserve to exclude the section of the river where the Xiangjiaba Dam is located (Dudgeon 2011, p. 1500; Dudgeon 2010, p. 129). The reserve, now renamed the National Natural Reserve Area of Rare and Special Fishes of the Upper Yangtze River, encompasses the reaches below the Xiangjiaba Dam from Yibin to Chongqing, as well as the tributaries that feed into the Yangtze (Zhang H. *et al.* 2011, p. 182; Fan *et al.* 2006, p. 35). The redrawing of the area of the reserve to accommodate the construction of Xiangjiaba Dam lends further evidence that local governments are prioritizing growth over environmental impacts. The construction of the Xiangjiaba Dam led to the impoundment of the reach upriver, which will affect the flow and sedimentation rate downstream (Cheng *et al.* 2015, p. 577; Dudgeon 2011, p. 1500). Given the lack of natural reproduction of the Yangtze sturgeon and future impacts from the dam, it is unlikely that the current boundary of the reserve will be sufficient to maintain a wild breeding population of this species (Kynard 2016, pers. comm.; Dudgeon 2011, p. 1500).

Restocking

As a result of the decline of the species, controlled reproduction and release of juvenile Yangtze sturgeon has occurred every year since 2007 (Zhang H. *et al.* 2011, p. 181). Between 2007 and 2012, more than 10,000 Yangtze sturgeon juveniles were released into the upper Yangtze on reaches downstream from Xiangjiaba Dam (Wu *et al.* 2014, p. 1). In 2014, restocking was started on the reaches below Gezhouba Dam (Du 2017, pers. comm.). While this number is relatively small in comparison with the 6 million Chinese sturgeon that have been released since 1983, the restocking of the Yangtze sturgeon represents efforts by local and state officials to try to maintain the species in the wild (Chen D. *et al.* 2009, p. 349).

Despite the efforts to restock the Yangtze sturgeon in the wild, current restocking efforts are unsuccessful (Wu *et al.* 2014, p. 4). No juveniles were caught 95 days after release, indicating that released sturgeon experienced a very high mortality rate (Wu *et al.* 2014, p. 4). There are multiple possible reasons for the limited success of current restocking efforts, including poor breeding and rearing techniques that result in progeny with low survival rates in the wild, high bycatch rate, and loss or deterioration of remaining habitats (Cheng *et al.* 2015, pp. 579–580; Du *et al.* 2014, p. 2; Shen *et al.* 2014, p. 1549; Zhang H. *et al.* 2011, p. 184). Thus, despite attempts to conserve the species in the wild through restocking, with all the other forces acting on the

Yangtze sturgeon, it is unlikely that current restocking efforts are adequate to improve the species' condition in the wild.

Stochastic (Random) Events and Processes

Species endemic to small regions, or known from few, widely dispersed locations, are inherently more vulnerable to extinction than widespread species because of the higher risk from localized stochastic (random) events and processes, such as industrial spills and drought. These problems can be further magnified when populations are very small, due to genetic bottlenecks (reduced genetic diversity resulting from fewer individuals contributing to the species' overall gene pool) and random demographic fluctuations (Lande 1988, pp. 1455–1458; Pimm *et al.* 1988, p. 757). Species with few populations, limited geographic area, and a small number of individuals face an increased likelihood of stochastic extinction due to changes in demography, the environment, genetics, or other factors, in a process described as an extinction vortex (a mutual reinforcement that occurs among biotic and abiotic processes that drives population size downward to extinction) (Gilpin and Soulé 1986, pp. 24–25). The negative impacts associated with small population size and vulnerability to random demographic fluctuations or natural catastrophes can be further magnified by synergistic interactions with other threats.

The Yangtze sturgeon is known from a single geographic population in the upper Yangtze River and its tributaries (Zhang *et al.* 2011, pp 181–182; Zhuang *et al.* 1997, p. 259). As a result, the species is highly vulnerable to stochastic processes and is negatively affected by these processes. In March 2000, for example, the Jinguang Chemical Plant, located on the Dadu River (a tributary of the Yangtze River), was found to be releasing yellow phosphorous into the Yangtze. This substance is highly toxic to aquatic organisms, including the Yangtze sturgeon (Chen D. *et al.* 2009, p. 343). Another spill in 2006 on the Yuexi River, which also feeds into the Yangtze, involved mercury being released into the river (Worldwatch Institute 2006, entire). These and other incidents, combined with the fact that the Yangtze River system is home to a large number of chemical plants, suggest that the risk of industrial spills is quite high. Therefore, stochastic processes will have negative impacts on the species in combination with other factors such as habitat modification and loss, and bycatch.

We note that, by using the SSA framework to guide our analysis of the scientific information documented in the SSA report, we have not only analyzed individual effects on the species, but we have also analyzed their potential cumulative effects. We incorporate the cumulative effects into our SSA analysis when we characterize the current and future condition of the species. Our assessment of the current and future conditions encompasses and incorporates the threats individually and cumulatively. Our current and future condition assessment is iterative because it accumulates and evaluates the effects of all the factors that may be influencing the species, including threats and conservation efforts. Because the SSA framework considers not just the presence of the factors, but to what degree they collectively influence risk to the entire species, our assessment integrates the cumulative effects of the factors and replaces a standalone cumulative effects analysis.

Summary of Comments and Recommendations

In the proposed rule published on December 27, 2017 (82 FR 61230), we requested that all interested parties submit written comments on the proposal by February 26, 2018. We also contacted appropriate Federal and State agencies, scientific experts and organizations, and other interested parties and invited them to comment on the proposal. We published a press release notifying the general public of the opportunity to comment on our proposed rule. We did not receive any requests for a public hearing. We reviewed all comments we received from peer reviewers and the public for substantive issues and new information. All substantive information provided during the comment period has either been incorporated directly into this final determination or is addressed below.

Peer Reviewer Comments

As discussed in Supporting Documents above, we received responses from two peer reviewers. We reviewed all comments we received from the peer reviewers for substantive issues and new information regarding the information contained in the SSA report. The peer reviewers generally concurred with our methods and conclusions, and provided additional information, clarifications, and suggestions to improve the final SSA report. Peer reviewer comments are addressed in the following summary and were incorporated into the final SSA report as appropriate.

One peer reviewer provided additional information on ongoing and new conservation efforts on the Yangtze River. These efforts include lengthening fishing bans within the species' range and the commencement of restocking efforts on reaches below Gezhouba Dam. We have incorporated the new information into this rule.

We received 24 public comments on the proposed rule to list the Yangtze surgeon as an endangered species under the Act. The majority of the comments reviewed were nonsubstantive as they were unrelated to the rule to list the Yangtze sturgeon. The following discussion summarizes issues and substantive information from public comments and provides our responses.

Comment (1): One commenter questioned the effectiveness of the listing of foreign species and stated that the listing of foreign species can have a negative impact on conservation efforts for foreign species undertaken by private entities.

Our Response: The decision to list a species under the Act is based on whether the species meets the definition of an endangered species or a threatened species, as defined under section 3 of the Act, and is made solely on the basis of the best scientific and commercial data available. Additionally, we were petitioned to list this species and are required to respond to the petition. Conservation measures provided to species listed as endangered or threatened under the Act include recognition, requirements for Federal protection, and prohibitions against certain practices. Recognition through listing results in public awareness, and may encourage and result in conservation actions by foreign governments, Federal and State governments, private agencies and interest groups, and individuals. Listing under the Act can help ensure that the United States and its citizens do not contribute to the further decline of the species. For additional information see Available Conservation Measures, below.

Comment (2): One commenter stated that the species should not be listed until more sources are included.

Our Response: The Service is required by the Act to make determinations solely on the basis of the best scientific and commercial data available. We based this final rule on all the information we received following the publication of the proposed rule, as well as all of the information we found during our own research. At this time, we consider the information we compiled to be the best available information. The information we received during the proposed rule's comment period has been incorporated into this final rule, as appropriate.

Determination of Yangtze Sturgeon Status

Section 4 of the Act (16 U.S.C. 1533) and its implementing regulations (50 CFR part 424) set forth the procedures for determining whether a species meets the definition of an endangered species or a threatened species. The Act defines an ''endangered species'' as a species that is in danger of extinction throughout all or a significant portion of its range, and a ''threatened species'' as a species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. The Act requires that we determine whether a species meets the definition of ''endangered species'' or ''threatened species'' because of any of the following factors: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence.

Yangtze Sturgeon Status Throughout All of Its Range

We have carefully assessed the best scientific and commercial information available on the Yangtze sturgeon. While we do not know the exact population size of the Yangtze sturgeon, the species was historically abundant enough to be commercially viable up to the 1970s, after which it experienced a significant decline (Kynard *et al.* 2003, p. 27). Loss of individuals due to overharvesting by fishermen on the Yangtze (Factor B) is the main factor that contributed to the historical decline of the species. Subsequent construction of dams on the Yangtze prevented the migration in the middle Yangtze and lower Jinsha, which has prevented recovery of the species in these areas (Miao *et al.* 2015, p. 2351; Wu *et al.* 2014, p. 2; Dudgeon 2010, p. 128; Fang *et al.* 2006, p. 375; Zhuang *et al.* 1997, p. 261). Additionally, dams affect the quality of the species' habitat through changes in discharge, temperature, and sedimentation rate (Zhang G. *et al.* 2012, p. 445; Du *et al.* 2011, p. 262; Chen Z. *et al.* 2001, p. 90). In addition to dams, the species' habitat is also adversely affected by riverbed modification to accommodate increasing boat traffic. The combined effects of dams and riverbed modification on the Yangtze River have resulted in the loss and reduction in quality of remaining habitat for the species (Factor A).

Despite conservation efforts undertaken by local and national authorities, such as fishing bans and restocking, current efforts do not appear to be successful in conserving the species. No natural reproduction has been documented in the wild since 2008 (Wu *et al.* 2014, p. 1). Additionally, restocked juvenile sturgeon experience very high mortality rates due to a high bycatch rate and an inability to survive in wild conditions (Du *et al.* 2014, p. 1; Wu *et al.* 2014, p. 4).

Industrial pollution, and hybridization with displaced native and nonnative sturgeon species, are also acting on the species (Factor E). Although we do not have information on the impact of industrial pollution on the species in the wild, there are high concentrations of TPT and EDC in the Yangtze River, and studies in a laboratory environment found that these pollutants can reduce the reproductive success rate of adult sturgeon (Hu *et al.* 2009, p. 9342; An and Hu 2006, pp. 379–380). While we do not have data on the hybridization of Yangtze sturgeon with other species, surveys conducted in the lower Yangtze River found that 69.9 percent of sturgeon species caught were hybrids (Li R. *et al.* 2009, p. 636). The results suggest that industrial pollution and hybridization, in tandem with other factors, are adversely affecting the species.

Therefore, for the following reasons, we conclude that this species has been and continues to be significantly reduced to the extent that the viability of the Yangtze sturgeon is significantly compromised:

(1) The species is limited to a single geographic population in the upper Yangtze River main stem and its tributaries. There is also some evidence of a small remnant population in the middle Yangtze.

(2) Loss of habitat and connectivity between the spawning and feeding reaches due to dam construction and operation is having a significant adverse effect on the species, which appears to have low to no reproduction in the wild.

(3) The cumulative effects of habitat modification and loss due to dams and riverbed projects, bycatch, industrial pollution, and hybridization are adversely affecting the species.

(4) Current restocking and management efforts are inadequate to maintain the species' presence in the wild.

(5) Stochastic events, such as industrial spills or drought, can reduce the survival rate of the species.

We find that the Yangtze sturgeon is presently in danger of extinction throughout its range based on the severity and immediacy of threats currently adversely affecting the species. The populations and distributions of the species have been significantly reduced to the point where there is low to no current reproduction in the wild, which is indicative of a very high risk of extinction, and the remaining habitat and populations are at risk due to a variety of factors acting alone and in combination to reduce the overall viability of the species.

After evaluating threats to the species and assessing the cumulative effect of the threats under the section 4(a)(1) factors, we find the following factors to be threats to this species (*i.e.,* factors contributing to the risk of extinction of this species): Loss and modification of habitat due to dams and riverbed expansion (Factor A); bycatch (Factor E); and cumulative effects (Factor E) of these and other threats, including industrial pollution and hybridization. Furthermore, current legal and management efforts over these practices are inadequate to conserve the species (Factor D). Thus, after assessing the best available information, we conclude that Yangtze sturgeon is in danger of extinction throughout all of its range. We find that a threatened species status is not appropriate for this species because of its restricted range, limited distribution, and vulnerability to extinction, and because the threats are ongoing throughout its range at a level that places this species in danger of extinction now.

Yangtze Sturgeon Status Throughout a Significant Portion of Its Range

Under the Act and our implementing regulations, a species may warrant listing if it is in danger of extinction or likely to become so in the foreseeable future throughout all or a significant portion of its range. We have determined that the Yangtze sturgeon is in danger of extinction throughout all of its range, and accordingly, did not undertake an analysis of any significant portions of its range. Because we have determined that the Yangtze sturgeon warrants listing as endangered throughout all of its range, our determination is consistent with the decision in *Center for Biological Diversity* v. *Everson,* 2020 WL 437289 (D.D.C. Jan. 28, 2020), in which the court vacated the aspect of the Final Policy on Interpretation of the Phrase ''Significant Portion of Its Range'' in the

Endangered Species Act's Definitions of ''Endangered Species'' and ''Threatened Species'' (79 FR 37578; July 1, 2014) that provided the Services do not undertake an analysis of significant portions of a species' range if the species warrants listing as threatened throughout all of its range.

Determination of Status

Our review of the best available scientific and commercial information indicates that the Yangtze sturgeon meets the definition of an endangered species. Therefore, we are listing the Yangtze sturgeon as an endangered species in accordance with sections 3(6) and 4(a)(1) of the Act.

Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened species under the Act include recognition, recovery actions, requirements for Federal protection, and prohibitions against certain practices. Recognition through listing results in public awareness, and encourages and results in conservation actions by Federal, State, Tribal, and local agencies, foreign governments, private organizations, and individuals. The Act encourages cooperation with the States and other countries and calls for recovery actions to be carried out for listed species. The protection required by Federal agencies and the prohibitions against certain activities are discussed, in part, below.

Section 7(a) of the Act requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as an endangered or threatened species and with respect to its critical habitat, if any is designated. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402. Section 7(a)(4) of the Act requires Federal agencies to confer with the Service on any action that is likely to jeopardize the continued existence of a species proposed for listing or result in destruction or adverse modification of proposed critical habitat. If a species is listed subsequently, section 7(a)(2) of the Act requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of the species or destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into consultation with the Service.

An ''action'' that is subject to the consultation provisions of section 7(a)(2) is defined in our implementing regulations at 50 CFR 402.02 as all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States or upon the high seas. With respect to this species, there are no ''actions'' known to require consultation under section 7(a)(2) of the Act. Given the regulatory definition of ''action,'' which clarifies that it applies to activities or programs ''in the United States or upon the high seas,'' the Yangtze sturgeon is unlikely to be the subject of section 7 consultations, because the entire life cycle of the species occurs in freshwater and nearshore marine areas outside of the United States unlikely to be affected by U.S. Federal actions. Additionally, no critical habitat will be designated for this species because, under 50 CFR 424.12(g), we will not designate critical habitat within foreign countries or in other areas outside of the jurisdiction of the United States.

Section 8(a) of the Act (16 U.S.C. 1537(a)) authorizes the provision of limited financial assistance for the development and management of programs that the Secretary of the Interior determines to be necessary or useful for the conservation of endangered or threatened species in foreign countries. Sections 8(b) and 8(c) of the Act (16 U.S.C. 1537(b) and (c)) authorize the Secretary to encourage conservation programs for foreign listed species, and to provide assistance for such programs, in the form of personnel and the training of personnel.

The Act and its implementing regulations set forth a series of general prohibitions and exceptions that apply to all endangered wildlife. The prohibitions of section 9(a)(1) of the Act, codified at 50 CFR 17.21, make it illegal for any person subject to the jurisdiction of the United States to import; export; deliver, receive, carry, transport, or ship in interstate or foreign commerce, by any means whatsoever and in the course of commercial activity; or sell or offer for sale in interstate or foreign commerce any species listed as an endangered species. In addition, it is unlawful to take (which includes harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect; or to attempt any of these) endangered wildlife within the United States or on the high seas. It is also illegal to possess, sell, deliver, carry, transport, or ship, by any means whatsoever any such wildlife that has been taken illegally. Certain exceptions apply to employees of the Service, the National Marine Fisheries Service (NMFS), other Federal land management agencies, and State conservation agencies.

We may issue permits to carry out otherwise prohibited activities involving endangered wildlife under certain circumstances. Regulations governing permits for endangered wildlife are codified at 50 CFR 17.22, and general Service permitting regulations are codified at 50 CFR part 13. With regard to endangered wildlife, a permit may be issued for the following purposes: For scientific purposes, to enhance the propagation or survival of the species, and for incidental take in connection with otherwise lawful activities. The Service may also register persons subject to the jurisdiction of the United States through its captive-bred-wildlife (CBW) program if certain established requirements are met under the CBW regulations (50 CFR 17.21(g)). Through a CBW registration, the Service may allow a registrant to conduct certain otherwise prohibited activities under certain circumstances to enhance the propagation or survival of the affected species: Take; export or re-import; deliver, receive, carry, transport or ship in interstate or foreign commerce, in the course of a commercial activity; or sell or offer for sale in interstate or foreign commerce. A CBW registration may authorize interstate purchase and sale only between entities that both hold a registration for the taxon concerned. The CBW program is available for species having a natural geographic distribution not including any part of the United States and other species that the Director has determined to be eligible by regulation. The individual specimens must have been born in captivity in the United States. There are also certain statutory exemptions from the prohibitions, which are found in sections 9 and 10 of the Act.

It is our policy, as published in the **Federal Register** on July 1, 1994 (59 FR 34272), 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 Act. The intent of this policy is to increase public awareness of the effect of a final listing on proposed and ongoing activities within the range of a listed species. Based on the best available information, the following actions are unlikely to result in a violation of section 9, if these activities are carried out in accordance with existing regulations and permit requirements; this list is not comprehensive:

(1) Take of the Yangtze sturgeon in its native range; and

(2) Trade in the Yangtze sturgeon and its products that is both outside the United States and conducted by persons

not subject to U.S. jurisdiction (although this activity would still be subject to CITES requirements).

Separate from its final listing as an endangered species, as a CITES-listed species, all international trade of Yangtze sturgeon by persons subject to the jurisdiction of the United States must also comply with CITES requirements pursuant to section 9(c) and 9(g) of the Act and to 50 CFR part 23. Applicable wildlife import/export requirements established under section 9(d) through 9(f) of the Act, the Lacey Act Amendments of 1981 (16 U.S.C. 3371 *et seq.*), and 50 CFR part 14 must also be met for Yangtze sturgeon imports and exports. Questions regarding whether specific activities would constitute a violation of section 9 of the Act should be directed to the Branch of Delisting and Foreign Species (see **FOR FURTHER INFORMATION CONTACT**).

Required Determinations

National Environmental Policy Act (42 U.S.C. 4321 et seq.)

We have determined that environmental assessments and environmental impact statements, as defined under the authority of the National Environmental Policy Act (42 U.S.C. 4321 *et seq.*), need not be prepared in connection with listing a species as an endangered or threatened species under the Endangered Species Act. We published a notice outlining our reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244).

References Cited

A complete list of references cited in this rulemaking is available on the internet at *http://www.regulations.gov* and upon request from the Branch of Delisting and Foreign Species, Ecological Services (see **FOR FURTHER INFORMATION CONTACT**).

Authors

The primary authors of this final rule are the staff members of the Branch of Delisting and Foreign Species, Ecological Services, Falls Church, VA.

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, Transportation.

Regulation Promulgation

Accordingly, we amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as set forth below:

PART 17—ENDANGERED AND THREATENED WILDLIFE AND PLANTS

■ 1. The authority citation for part 17 continues to read as follows:

Authority: 16 U.S.C. 1361–1407; 1531–1544; and 4201–4245, unless otherwise noted.

■ 2. Amend § 17.11(h) by adding an entry for ''Sturgeon, Yangtze'' to the List of Endangered and Threatened Wildlife in alphabetical order under FISHES to read as follows:

§ 17.11 Endangered and threatened wildlife.

* * * * *

(h) * * *

Common name	Scientific name	Where listed	Status	Listing citations and applicable rules
*	*	*	*	* * *
		FISHES		
*	*	*	*	* * *
Sturgeon, Yangtze.	*Acipenser dabryanus.*	Wherever found ..	E	86 FR [insert **Federal Register** page where the document begins], 4/26/2021.
*	*	*	*	* * *

Martha Williams,

Principal Deputy Director, Exercising the Delegated Authority of the Director, U.S. Fish and Wildlife Service.

[FR Doc. 2021–08466 Filed 4–23–21; 8:45 am]

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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 648

[Docket No. 200723–0199; RTID 0648–XA979]

Fisheries of the Northeastern United States; Northeast Multispecies Fishery; Common Pool Fishery and Other Measures for Fishing Year 2021

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

ACTION: Temporary rule; possession and trip limit implementation.

SUMMARY: This action implements measures for the Northeast multispecies fishery for the 2021 fishing year. This action is necessary to ensure that the Northeast multispecies common pool fishery may achieve the optimum yield for the relevant stocks, while controlling catch to help prevent in-season closures or quota overages. These measures include possession and trip limits, the allocation of zero trips into the Closed Area II Yellowtail Flounder/Haddock Special Access Program for common pool vessels to target yellowtail flounder, and the closure of the Regular B Days-at-Sea Program.

DATES: Effective at 0001 hours on May 1, 2021, through April 30, 2022.

FOR FURTHER INFORMATION CONTACT: Spencer Talmage, Fishery Management Specialist, 978–281–9232.

SUPPLEMENTARY INFORMATION: The Northeast Multispecies Fishery Management Plan (FMP) regulations give the Regional Administrator the authority to implement certain types of management measures for the common pool fishery, the U.S./Canada Management Area, and Special Management Programs. This action implements a number of these management measures for the 2021 fishing year, effective May 1, 2021.

Common Pool Trip Limits

The regulations at § 648.86(o) give the Regional Administrator the authority to implement or adjust a per-Day-at-Sea (DAS) possession limit and/or a maximum trip limit in order to prevent exceeding the common pool sub-annual catch limit (sub-ACL) in that fishing