

**Baiji/Chinese River Dolphin/Yangtze River Dolphin**  
*(Lipotes vexillifer)*

**5-Year Review:  
Summary and Evaluation**

**National Marine Fisheries Service  
Office of Protected Resources  
Silver Spring, MD**

## **5-YEAR REVIEW**

### **Baiji/ *Lipotes vexillifer***

#### **1.0 GENERAL INFORMATION**

##### **1.1 Reviewers** (*list primary reviewers of species information below*)

###### **Lead Regional or Headquarters Office:**

Larissa Plants, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Office of Protected Resources, Silver Spring, MD (301) 427-8471

##### **1.2 Methodology used to complete the review:**

This review was prepared pursuant to section 4(c)(2) of the Endangered Species Act (ESA) and in accordance with sections 4(a) and (b) of the ESA following guidance provided in the joint NMFS and U.S. Fish and Wildlife 5-year Review Guidance and template ([http://www.nmfs.noaa.gov/pr/pdfs/laws/guidance\\_5\\_year\\_reivew.pdf](http://www.nmfs.noaa.gov/pr/pdfs/laws/guidance_5_year_reivew.pdf)). The National Marine Fisheries Service (NMFS) initiated a 5-year review of the Baiji (*Lipotes vexillifer*) in July 2010. NMFS solicited information from the public through Federal Register notice (75 FR 42684; July 22, 2010) and no germane comments were received. To complete the 5-year review, we did a literature search and evaluated all information that has become available on the species since it was listed as endangered in 1989.

##### **1.3 Background:**

**1.3.1 FR Notice citation announcing initiation of this review:** 75 FR 42684

###### **1.3.2 Listing history**

###### Original Listing

**FR notice:** 54 FR 22906

**Date listed:** 1989

**Entity listed:** Species

**Classification:** Endangered

**1.3.3 Associated rulemakings:** N/A

**1.3.4 Review History:** N/A

**1.3.5 Species' Recovery Priority Number at start of 5-year review:** N/A

**1.3.6 Recovery Plan or Outline**

**Name of plan or outline:** N/A– It was determined that a plan will not promote the conservation of the species because it exists solely in foreign waters.

## 2.0 REVIEW ANALYSIS

### 2.1 Application of the 1996 Distinct Population Segment (DPS) policy

2.1.1 Is the species under review a vertebrate?

*Yes*  
 *No*

2.1.2 Is the species under review listed as a DPS?

*Yes*  
 *No*

2.1.3 Was the DPS listed prior to 1996?

*Yes*  
 *No*

2.1.3.1 Prior to this 5-year review, was the DPS classification reviewed to ensure it meets the 1996 policy standards?

*Yes*  
 *No*

2.1.3.2 Does the DPS listing meet the discreteness and significance elements of the 1996 DPS policy?

*Yes*  
 *No*

2.1.4 Is there relevant new information for this species regarding the application of the DPS policy?

*Yes*  
 *No*

### 2.2 Recovery Criteria

N/A

**2.2.1 Does the species have a final, approved recovery plan containing objective, measurable criteria?**

*Yes*  
 *No*

**2.2.2 Adequacy of recovery criteria.**

N/A

**2.2.2.1 Do the recovery criteria reflect the best available and most up-to date information on the biology of the species and its habitat?**

*Yes*  
 *No*

**2.2.2.2 Are all of the 5 listing factors that are relevant to the species addressed in the recovery criteria (and is there no new information to consider regarding existing or new threats)?**

*Yes*  
 *No*

**2.2.3 List the recovery criteria as they appear in the recovery plan, and discuss how each criterion has or has not been met, citing information**

N/A

## **2.3 Updated Information and Current Species Status**

### **2.3.1 Biology and Habitat**

#### **2.3.1.1 New information on the species' biology and life history:**

The baiji is a freshwater dolphin and considered the most endangered cetacean in the world. It has several common names including the Chinese River dolphin, the Yangtze River dolphin, white-flag dolphin, and white-fin dolphin. The baiji is the only member of the family Lipotidae (Rice 1998). Scientists debated this phylogenetic position for years, but molecular studies have supported the determination of Lipotidae as a separate family (Yan et al. 2005).

The baiji is pale blue to grey on the dorsal side and white on the ventral side (Zhou 1989). Its beak is long and slightly upturned (Zhou 2006), with 31–36 conical teeth on either jaw (Zhou and Li 1989). The dorsal fin is low, and triangular in shape. A mature baiji can measure 8 ft long and females tend to be larger than males (Zhou and Li 1989). Like other freshwater dolphins, the eyes

are smaller than those of marine dolphins and located higher on the head (Zhou 1989; Zhou 2006) as a result of the lack of visibility in the murky water of the Yangtze River. Thus, the baiji relies on underwater sound for orientation, feeding, and communication. The baiji produces two primary sounds—whistles for communication and clicks for echolocation (Wang et al. 1989; Xiao and Jing 1989).

Breeding takes place in the first half of the year (Zhou and Li 1989), with most births taking place between February and April (Zhou 2006). Gestation lasts for 10–11 months, and a newborn calf is about 3 ft long (Zhou and Li 1989). The baiji reaches maturity at 4–6 years old (Zhou 2006). Normally they live in groups of 2–4 individuals, but a group of 16 has been observed (Zhou 2006; Zhou and Li 1989).

**2.3.1.2 Abundance, population trends (e.g., increasing, decreasing, stable), demographic features (e.g., age structure, sex ratio, family size, birth rate, age at mortality, mortality rate, etc.), or demographic trends:**

Scientists have observed a steady decline in the baiji population since the first Yangtze River surveys conducted in the late 1970's.

- Zhou (1982) assumed that there were about 400 animals based on quantitative survey data from 1979–1981.
- From surveys conducted in 1985–1986 by Chen and Hua (1989), the total population was concluded to be around 300.
- Zhou and Li (1989) estimated that there were 100 baiji in a 770 km segment of the lower Yangtze based on surveys conducted from 1982–1986.
- Zhang et al. (2003) concluded after surveys of the middle and lower reaches of the main Yangtze River and its estuary from 1997–1999 that there were a minimum of 13 individuals in the river.

The last photographic supported sighting was in 2002 and the last confirmed stranding was in 2001 (Turvey et al. 2007). In November and December of 2006, a visual and acoustic survey failed to locate a single baiji leading to conclusions that the baiji is likely extinct (Turvey 2008; Turvey et al. 2007). A few sightings have been reported since the 2006 rangewide survey, but these reports have not been verified.

**2.3.1.3 Genetics, genetic variation, or trends in genetic variation (e.g., loss of genetic variation, genetic drift, inbreeding, etc.):**

There is no new genetic information.

**2.3.1.4 Taxonomic classification or changes in nomenclature:**

There are no changes in the taxonomic classification or nomenclature.

**2.3.1.5 Spatial distribution, trends in spatial distribution (e.g. increasingly fragmented, increased numbers of corridors, etc.), or historic range (e.g. corrections to the historical range, change in distribution of the species' within its historic range, etc.):**

The baiji is found only in freshwater, particularly in the Yangtze River in China, where they ranged from the mouth of the river at Shanghai (Zhou and Li 1989) up to the Three Gorges area (Zhou 2006). Traditionally, the baiji were present in middle to lower areas of the Yangtze River, its tributaries, and connecting lakes (Zhou et al. 1977). The baiji were seen in the Qiantang River and Fuchun River before the construction of the Xinanjiang Hydropower Station (Liu et al. 2000a; Turvey 2008; Zhou 2006) and occurred in the Dongting and Poyang Lakes (Liu et al. 2000a; Zhou et al. 1977).

Baiji are attracted to counter-current eddies around banks and sandbars (Hua et al. 1989; Zhang et al. 2003; Zhou 2006) where the water is calmer (Turvey 2008). These are areas of high fish abundance (Hua et al. 1989) and, consequently, major fishing areas (Zhou 2006).

**2.3.1.6 Habitat or ecosystem conditions (e.g., amount, distribution, and suitability of the habitat or ecosystem):**

Water development significantly changed the baiji's habitat by interrupting the movement of the dolphins upstream of dams, eliminating their entrance to tributaries, and depleting fish resources (Chen and Hua 1989; Liu et al. 2000a; Zhou and Li 1989). Construction on the first dam on the mainstem of the Yangtze River—Gezhouba Dam—began in 1970 and cut off upstream habitat between the dam and the Three Gorges area, affected counter-current habitat below the dam, and reduced fish populations (Liu et al. 2000b; Wang et al. 2006b).

**2.3.2 Five-Factor Analysis (threats, conservation measures, and regulatory mechanisms)**

**2.3.2.1 Present or threatened destruction, modification or curtailment of its habitat or range:**

Water pollution in the Yangtze River is a moderate threat due to mercury accumulation. Zhou et al. (1998) reported that 15.6 billion cubic meters of waste water were discharged into the Yangtze each year as of 1998, 12.3 billion tons of which are industrial pollution, and of this waste, 80 percent is untreated. Nutrients from agricultural runoff are a major pollutant in the Yangtze River estuary and the use of fertilizers has been increasing in the river basin since the 1970's (Daoji and Daler 2004; Turvey et al. 2010). Studies of Yangtze finless

porpoise, who inhabit the same area of the Yangtze River as baiji, have shown high mercury concentrations (Wang et al. 2006b).

Vessel traffic in the river is also a threat to the baiji. By 1992 there were 221 ports along the Yangtze (Turvey et al. 2010; Zhou et al. 1998) and during the most recent baiji survey in 2006, researchers counted 19,830 large shipping vessels and 1175 fishing vessels in the survey area between Yichang and Shanghai (Turvey 2008; Turvey et al. 2007). This increases the chance that baiji will be injured or killed by a propeller strike (Chen et al. 1997; Zhou and Zhang 1991) or that underwater noise from the vessels will affect the baiji's communication and echolocation (Wang et al. 2006b).

#### **2.3.2.2 Overutilization for commercial, recreational, scientific, or educational purposes:**

Overfishing was a major cause of the baiji's decline, both from reducing the baiji's prey and leading to baiji bycatch in the fishing gear. Fish catch in the Yangtze plummeted from a high of 458,000 tons in 1954 to 100,000 tons by the 1980s (Turvey et al. 2010), reducing prey for the baiji. Baiji also ended up as bycatch in local fisheries using rolling hooks, gillnets, fyke nets, and electro-fishing (Zhou et al. 1998; Zhou and Wang 1994). The animals frequently had scars and open wounds from rolling hooks, and hook remains are sometimes found in the stomachs of dead animals (Lin et al. 1985; Turvey et al. 2010; Zhou and Li 1989)—50 to 60 percent of dead baiji found in the 1970s and 1980s had evidence of hook marks. Electric fishing, although illegal, is also widely practiced in the Yangtze River (IWC 2001; Wang et al. 2006b) and was known as the most significant direct threat to the species in the 2000s (Zhang et al. 2003). The shocks kill baiji and other aquatic organisms, including the baiji's prey (Chen and Hua 1989).

#### **2.3.2.3 Disease or predation:**

There are no records of disease or predation of the species.

#### **2.3.2.4 Inadequacy of existing regulatory mechanisms:**

Since 1986, five reserves have been established along the middle and lower areas of the Yangtze River as protection of the species (Wang et al. 2006a).

Unfortunately, these reserves were ineffective in preventing the decline of the dolphins (Wang et al. 2006a). The use of rolling hook longlines, fyke nets, and electric fishing was banned, but the ban has had little effect on human behavior and these fishing practices continue (Turvey 2008; Zhou et al. 1998).

#### **2.3.2.5 Other natural or manmade factors affecting its continued existence:**

There are no additional natural or manmade factors affecting the baiji's continued

existence.

**2.4 Synthesis** - While no baiji were seen during the 2006 survey, there are still periodic, undocumented claims of baiji sightings (Turvey et al. 2010). While there may still be a few individuals in the Yangtze River and its tributaries, it is unlikely that these individuals would be able to perpetuate the species considering the existing threats in the Yangtze River and the survival potential of small populations. This leads to us conclude that the baiji is extremely close to, if not already, extinct. While we determine that the baiji is functionally extinct, we do not recommend changing the classification at this time.



### 3.0 RESULTS

#### 3.1 Recommended Classification:

**Downlist to Threatened**

**Uplist to Endangered**

**Delist** (*Indicate reasons for delisting per 50 CFR 424.11*):

*Extinction*

*Recovery*

*Original data for classification in error*

**No change is needed**

3.2 New Recovery Priority Number: N/A

3.3 Listing and Reclassification Priority Number, N/A

### 4.0 RECOMMENDATIONS FOR FUTURE ACTIONS

No future actions are recommended.

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- Chen, P., and Y. Hua. 1989. Distribution, population size and protection of *Lipotes vexillifer*. Pages 81–85 in W. F. Perrin, R. L. Brownell, K. Zhou, J. Liu, and (eds.), editors. Biology and Conservation of the River Dolphins. World Conservation Union, Gland, Switzerland.
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NATIONAL MARINE FISHERIES SERVICE  
5-YEAR REVIEW  
*Lipotes vexillifer*

Current Classification: Endangered

Recommendation resulting from the 5-Year Review

- Downlist to Threatened
- Uplist to Endangered
- Delist
- No change is needed

Review Conducted By: Larissa Plants

REGIONAL OFFICE APPROVAL:

Lead Regional Administrator, NOAA Fisheries

Approve: \_\_\_\_\_ Date: \_\_\_\_\_

*The Lead Region must ensure that other Regions within the range of the species have been provided adequate opportunity to review and comment prior to the review's completion. Written concurrence from other regions is required.*

Cooperating Regional Administrator, NOAA Fisheries

Concur  Do Not Concur

Signature \_\_\_\_\_ Date \_\_\_\_\_

HEADQUARTERS APPROVAL:

Assistant Administrator, NOAA Fisheries

Concur  Do Not Concur

Signature  \_\_\_\_\_ Date 2/15/12