



# Global Re-introduction Perspectives: 2013

Further case-studies from around the globe  
Edited by Pritpal S. Soorae



IUCN/SSC Re-introduction Specialist Group (RSG)





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## Re-introduction of the oriental white stork for coexistence with humans in Japan

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### Introduction

The endangered oriental white stork (*Ciconia boyciana*) (OWS) is distributed within the Far East with a global population size estimated to be between 1,000 to 2,499 birds (IUCN, 2012). In Japan the OWS was common up until the first half of 19<sup>th</sup> century, but declined in number thereafter due to human persecution. The last wild population persisted for a time in the Tajima District, in the northern part of Hyogo Prefecture, but had died out completely by 1971 due to widespread pesticide application. The Government of Hyogo Prefecture had established a captive population in the 1960s, and successful breeding started in 1989. With an increasing captive population size, the government planned a re-introduction project aiming at restoring the harmonious coexistence between humans and storks. All these programs concerning conservation and re-introduction of the OWS have been practiced under close cooperation with the Agency for Cultural Affairs, Japan. The first releases of captive-bred bird by the Hyogo Park of the Oriental White Stork (HPOWS, established 1999 by Hyogo Prefecture) took place in Tajima in the autumn of 2005 (Ohsako *et al.*, 2008).

### Goals

- Goal 1: Re-establishment of the Japanese OWS population in coexistence with humans.
- Goal 2: Establishment of a meta-population structure in Japan.
- Goal 3: Linkage with the continental populations to fuse them into a meta-population.
- Goal 4: Contribution to the global conservation of the species.



Oriental white stork



Stork habitat - co-existing with humans

## Success Indicators

- Indicator 1: Survival of released birds.
- Indicator 2: Reproduction in the wild.
- Indicator 3: Establishment of other local populations in Japan.
- Indicator 4: Maintenance of genetic diversity within the birds in the wild.
- Indicator 5: Understanding and cooperation by local communities promoting coexistence with the storks.

## Project Summary

**Feasibility:** The original habitat of the OWS is floodplain where intensive rice cultivation has been taking place for a long time in Japan. Wild storks in the past naturally foraged within paddy fields and they were regarded as a nuisance through their trampling of seedlings of the rice plant. Thus it was a key challenge to persuade the local people to support the re-introduction. The project was based on the IUCN Guidelines for Re-introduction (IUCN, 1998) and developed into an action plan in 2003 under the slogan “Environment where storks can live is also safe and secure for humans” (CROWS, 2003). With the agreement of the local community a Liaison Committee for Re-introduction was organized with participation from all stakeholders, and efforts were made to improve both the natural and the social environment, e.g. restoration, education, and a newly developed cultivation method that helps production of prey animals.

**Implementation:** Twenty-seven storks were released by HPOWS between 2005 and 2010 within the rural area of Toyo-oka City, situated at the northernmost part of Tajima District. Artificial nest towers last used by wild birds in the 1960s, were renovated by stakeholders with the result that the wild storks again use them for nesting. Some birds were artificially fed to encourage their settlement, and a significant number of birds foraged in an open cage within the property of HPOWS where prey fish are supplied every day to flightless display storks.

**Post-release monitoring:** Monitoring and scientific studies have been conducted by HPOWS researchers. Of the 24 released birds (3 of the 27 were taken back into captivity again) 16 survived at the start of the 2012 breeding season as the first generation in the wild, a 67% overall survival rate. The first pair was formed in 2006 and the number of pairs increased from 2 in 2007, 5 in 2008, 6 in 2009, 7 in 2010 and 9 in 2012. The first fledgling of the second generation was thus produced in 2007 and by 2011 a total of 36 second generation birds had

fledged, with 29 of them still alive at the start of the 2012 breeding season. The annual survival rate of young after fledging is as high as 81%. With the addition of a female believed to have immigrated from the continent, the total population size has increased to 46. By monitoring an almost fully banded population, it was shown that this species has territories defended by pairs throughout the year, and immature birds younger than four years live as floaters. Based on scientific analysis of monitoring data a grand-design for re-introduction was developed by HPOWS (2011).

Although young birds fly long distances and visit various districts of Japan, they usually return to Tajima centered by Toyo-oka Basin after a short stay in each district, possibly indicating some difficulty in natal dispersal and suggesting low food availability in rural areas where bio-productivity has declined due to a change in the water-supply system for paddy fields all over Japan. Other than this, the limited genetic variability of released birds, with highly biased breeding success among pairs, increases the probability of inbreeding in the wild. Genetic analysis of skins of the past wild birds (Murata *et al.*, 2004) suggests that they were in the midst of an extinction vortex due to inbreeding (HPOWS, 2011). In order to lower the probability of inbreeding in the present population, birds belonging to new families were added to the captive population, with some of them being released in 2012. In addition, various attempts are conducted to reduce the birds' use of artificial feeding (Ohsako & Ezaki, 2011).

Another problem is the fact that some pairs use nest-towers built at the center of a paddy field, completely in open space. As the past wild population nested in pine trees on hillsides, pairs were invisible to each other as long as they stayed on the nest. But with introduction of nest-towers just before the extinction of the wild population, birds started to nest in open space and this arrangement is considered by local people to be the normal situation. After re-introduction, eggs and chicks in tower nests are sometimes attacked by neighboring pairs while the parents are absent from the nest, indicating that those nest-towers should be moved to hillside. In order to solve this problem

HPOWS experimentally moved a nest-tower just before 2012 breeding season. Efforts to establish other local populations also have started. A pair of captive storks were lent from HPOWS to Fukui Prefecture where the local government is now engaged in captive breeding with the aim of supporting re-introduction in the future. Lastly, in



**Third generation wild storks**

2012, a total of four birds of the third generation fledged from two nests, one of which was reared completely free from artificial feeding. We call this the “first genuinely wild” bird.

## Major difficulties faced

- Poor prey animal communities, especially that of fish.
- Dependence of storks on artificial food.
- High probability of inbreeding.

## Major lessons learned

- It is very difficult to restore the Japanese rural environment in the face of bio-productivity declines due to a changing system of paddy field irrigation. But it must be restored at least partially using any possible engineering methods, as this will contribute not only to re-introduction but also to conservation of local biodiversity, especially in aquatic animals.
- It is easy for the storks to depend on artificial feeding and it is difficult to reduce reliance on that, mainly because of social reasons, especially the mind of local people loving the beautiful bird.
- Education is important to persuade people that wild animals are not free from death, especially when they are young.

## Success of project

Highly Successful	Successful	Partially Successful	Failure
		√	

### Reason(s) for success/failure:

- Acclimatization and training were successful due to the high adaptability of the storks.
- It is easy for the storks to form pairs in the wild, whereas it is difficult to achieve this in captivity.
- The storks are attractive and iconic enough to promote regional development and local environmental action.
- Establishment of the Liaison Committee for Re-introduction by Hyogo Prefecture.

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