Global Re-introduction Perspectives: 2013

Further case-studies from around the globe

Edited by Pritpal S. Soorae

IUCN/SSC Re-introduction Specialist Group (RSG)

RSG

Environment Agency - Abu Dhabi

DENVER ZOO

Published by: IUCN/SSC Re-introduction Specialist Group & Environment Agency-ABU DHABI

Citation: Soorae, P. S. (ed.) (2013). *Global Re-introduction Perspectives: 2013. Further case studies from around the globe*. Gland, Switzerland: IUCN/SSC Re-introduction Specialist Group and Abu Dhabi, UAE: Environment Agency-Abu Dhabi. xiv + 282 pp.

ISBN: **978-2-8317-1633-6**

Cover photo: Clockwise starting from top-left:
i. Fen Raft Spider, UK © Helen Smith
ii. *Manglietia longipedunculata* © Late Prof. Qingwen Zeng
iii. European Tree Frog, Latvia © Andris Eglitis
iv. Red Wolf © USA John Froschauer/PDZA
v. Hungarian Meadow Viper © Tamás Péchy
vi. Westslope Cutthroat Trout, USA © Carter Kruse, Turner Enterprises, Inc./Turner Endangered Species Fund
vii. Oriental White Stork, Japan © Yoko Mitsuhashi

Cover design & layout by: Pritpal S. Soorae, IUCN/SSC Re-introduction Specialist Group

Produced by: IUCN/SSC Re-introduction Specialist Group & Environment Agency-ABU DHABI

Download at: www.iucnsscrsg.org / www.iucn.org

Experimental translocation (re-inforcement) of the Hermann's tortoise, Var, France

Sébastien Caron[1], Jean-Marie Ballouard[1], Oriane Lepeigneul[1] & Xavier Bonnet[2]

[1] - Station d'Observation et de Protection des Tortues et de leurs Milieux, Chelonian Conservation and Research Center, PO Box 24, 83590 Gonfaron, France
sebastien.caron@soptom.fr & jean-marie.ballouard@soptom.fr
[2] - Centre d'Etudes Biologiques de Chize, CNRS-UPR 1934, 79360 Villiers en Bois, France bonnet@cebc.cnrs.fr

Introduction

Hermann's tortoise (*Testudo hermanni hermanni*, Gmelin 1789) is one of the most threatened reptiles in Europe. The decline began in 1910s in Western Europe distribution (Italy, France, Spain and some Mediterranean islands) and its future is seriously jeopardized. The subspecies is the only terrestrial chelonian in mainland France. This subspecies has totally disappeared from Eastern Pyrenees around the 1960s - 1970s. Fragmented populations remain in the Var, mainly in the Plain and the Massif of the Maures. Since 20 years conservation measures have been undertaken. Although the total area of distribution of the species remains unchanged, populations are particularly vulnerable due to habitat loss, forest fire, illegal collection and use of heavy machines for agriculture and forestry.

This species is listed on the Appendix II (A) of the CITES and is classified as "almost threatened" on the World Red List and as "Vulnerable" on the national Red List. The Var populations is "in danger" according to the IUCN terminology. Conservation projects (e.g. translocation) should protect and facilitate the reconnection of the twenty reproductive fragments identified (Livoreil, 2009). It might be a suitable tool to re-enforce the most weakened populations living in the "Plaine des Maures" (Var).

Hermann's tortoise

Goals

- Goal 1: Replace tortoises in a favorable new environment rather than release them into their original but degraded landscape or maintaining them in a care center.
- Goal 2: Identification of potential translocation sites in the species' historic range.
- Goal 3: Determining which individuals to release according to sanitary conditions,

genetic profiles and life story. These tortoises are wild animals from rescue operations or those found wounded.
- Goal 4: Determination of the best season of releasing (spring vs. autumn) considering survival and site fidelity.
- Goal 5: Annual monitoring of individuals (both wild and translocated).
- Goal 6: Re-inforcement of populations in protected area with suitable habitat and low predation risk but weakened by forest fires.

Success Indicators

- Indicator 1: Get a national and ministerial agreement for a translocation plan.
- Indicator 2: Establishment of pre- and post-release monitoring program.
- Indicator 3: Measurement of survival, settlement/dispersal and eco-physiological state of the released tortoises; comparison between released and wild tortoises.
- Indicator 4: Self-sustaining populations established at local site.

Project Summary

Feasibility: Despite conservation measures, every year several wild specimens of Hermann's tortoise are displaced from their natural habitat (rescue operations or found wounded). The rescued tortoises are brought back to SOPTOM but cannot be kept indefinitely. After genetics and sanitary tests, wild native tortoises are maintained temporarily in the breeding facilities. The release of individuals may help to restore native population impacted by a fire (Lecq *et al.*, submitted) but such events lead to a high mortality rate (50% - 70 %) and populations need several decades to re-establish themselves. However, such actions face several complications such as homing behavior, and is one of the main elements, that could compromise the establishment and the survival of the released tortoises. Conditions of release may improve the chance of success, but experiments are lacking. Within the framework of the conservation Life+ program (2010 - 2014), we aim to evaluate the effect of season (spring vs. autumn) on the release success (dispersal, survival, reproduction etc.). A translocation plan was accepted at the national and ministerial level in 2012.

A feasibility study focused on the biology of the species was undertaken in 2011 (origin of the individuals, genetics, sanitary, knowledge of the native population etc.). An assessment of potential translocation sites was made by evaluating criteria of eligibility according to IUCN recommendations. Two sites located in the area of historic distribution were chosen. First site is in the National Nature Reserve of the Maures' Plain, second is located in a national forest managed by French government. The first site was damaged by a fire in 1979 and was the place of reforestation. The second was impacted by forestry operations during 30 years (1960 - 1990) and a fire in 1990. We evaluated a group of important criteria for the survival of released tortoises. They were developed from the experience of the Hermann's tortoise re-introduction project in Spain (Bertolero *et al.*, 2007). On both sites, previous counting indicates a very low density of native tortoises and effects of predation were unknown. These sites provide suitable habitat for food resource, thermoregulation, water etc. Long-term protection and control of the sites are effective.

Implementation: We did an initial survey in 2012 on the two sites, one year before translocation, in order to collect ecological (spatial movements, habitat use) and physiological data (survival, thermoregulation and sanitary condition). On both release sites, we followed one pool of tortoise from the native population ("resident group") and one from an adjacent population ("control group"). This allows us to control the possible effect of site, and interaction between the released tortoises and the native population (USFWS, 2011). During this initial survey, we noticed on the second site a strong predation pressure; probably a badger (*Meles meles*) which killed a third of the wild radio-tracked tortoises (3/9).

In 2011 - 2012, with growing concerns about the global impact of emerging infectious diseases, an extensive health screening program of wild origin tortoises held in captivity was established. Because *Mycoplasma agassizii* and tortoise herpesvirus are important pathogens (Salinas *et al.*, 2011), tortoises underwent viral, parasitological, morphological and blood screening prior to release. We chose healthy tortoises from Var origin (genetic).

Post-release monitoring: We decided to implement the experimental design only on the first site exempted from predation. We hard-released 12 individuals within a host population during the 2013 spring (after hibernation emergence). Each pool of released tortoises is followed during the two years in order to quantify dispersion, site fidelity, micro-habitat use, survival, reproduction, etc. Qualitative data relying on thermal behavior, body and sanitary condition, physiology are measured (stress, metabolites, etc.) by blood sampling and data loggers. In parallel, similar measurements are done on both groups of tortoises: native and control. The expected outcome of short term successful translocation could be: high level of survival, stable body condition, low baseline stress levels, similar habitat used by native and released tortoises, easy thermoregulation behavior, etc. The success of the action will be evaluated in the mid-term (3 to 15 years after release) and in the long-term by Capture-Mark-Recapture study.

We radio-tracked both translocated in 2013 and resident/control individuals in 2012 and 2013. More than four months after the spring translocation, the tortoises did not exhibit short-term costs (e.g. decrease in body condition); resident individuals did not display any sign of perturbation caused by the introduction of novel individuals. No mortality was noticed, the tortoises did not scatter more than the resident tortoises (no homing behavior). Movement patterns were typical of the species, with males travelling longer daily distances than females. Shell temperature was highly dependent on environmental temperature, and generally higher, suggesting an active thermoregulation behavior. From a conservation perspective, our results are encouraging for the expected settlement of translocated individuals. Although, it has been suggested that soft-release might be preferable over a hard-release to limit dispersal risk (Attum *et al.*, 2011); our results favor a direct, hence simple approach. This specific question will be tested in autumn 2013 by releasing individuals just before hibernation.

Major difficulties faced

Radio-tracking Hermann's tortoise

- Selection of healthy (absence of mycoplasma) and genetically clean individuals of wild origin (from South of France) - few individuals are available after selection.
- Predators - notably the wild boar (*Sus scrofa*) and the badger remain widespread and a very significant threat and are difficult to control.
- Because of the two points mentioned above it is impossible to completely implement the experiment on both sites. As the number of available individuals is restricted after health and genetic selection (twice lower than what was planned), we decided to implement the experiment only in one site.
- No difficulties faced during the first four months of post-release.

Major lessons learned

- Future health screening programs should take into account that Mycoplasma are present in the wild population. We are implementing a parallel sanitary survey in wild populations and we have at present a reliable method for the detection of Mycoplasma, an emerging infectious disease known to impact gopher tortoises in North America, *Testudo graeca* in both wild and captive populations and *Testudo hermanni* in captivity. We do not know the effect of this disease on Hermann's tortoise wild populations.
- All translocated tortoises are from sites more than 10 km of the release site. As a potential consequence, no homing behavior was observed during the first two months of post-release.
- We did not notice any short-term effects associated to the translocation (e.g. decrease in body condition or mortality).
- Careful field monitoring and the measurement of both movement and ecophysiological parameters help to better evaluate the translocation success in a short term period.

Success of project

Highly Successful	**Successful**	Partially Successful	Failure
	√		

Reason(s) for success/failure:

- Tortoises were able to find appropriate micro-habitats and adequately adjusted their thermoregulation strategy to local conditions.
- The short-term success of the experience was possibly influenced by the high quality of the habitat, particularly heterogeneous with abundant natural resources.
- Resident individuals did not show any sign of perturbation caused by the introduction of novel individuals. Instead, we observed mating between resident and translocated tortoises, several females were observed laying.
- Long term monitoring is required to better assess the establishment of the individuals in the resident population.

References

Attum, O., Otoum, M., Amr, Z. & B.,Tietjen (2011) Movement patterns and habitat use of soft released translocated spur-thighed tortoises *Testudo graeca*. European Journal of Wildlife Research, 57: 251 - 258.

Bertolero A., Oro D., & A., Besnard (2007) Assessing the efficacy of reintroduction programmes by modeling adults survival: the example of Hermann's tortoise. Animal Conservation, 10: 360 - 368.

Lecq S., Ballouard J.M., Caron S., Livoreil B., Seynaeve V., Matthieu L.-A. & X., Bonnet. Long-term impact of fire on habitat and body condition in the Hermann's tortoise (unpublished).

Livoreil (2009) Distribution of the endangered Hermann's tortoise *Testudo hermanni hermanni* in Var, France, and recommendations for its conservation. Oryx, 43(2): 299 - 305.

Salinas, M., Francino, O., Sanchez,A. & L., Altet (2011) Mycoplasma and Herpesvirus PCR Detection in Tortoises with Rhinitis-stomatitis Complex in Spain. Journal of Wildlife Diseases, 47(1): 195 - 200.

U.S. Fish and Wildlife Service (2011) Translocation of desert tortoises (Mojave population) from project sites: plan development guidance. April 2011, 11 p.