Husbandry Manual for Radiated (*Astrochelys radiata*) and Spider Tortoises (*Pyxis arachnoides*)

Facilitating the Care and Reintroduction of Confiscated Tortoises

Training Workshops at the Cap Sainte Marie Special Reserve and the Village de Tortue, Ifaty

March 2012
Executive Summary

Radiated and Spider Tortoises are critically endangered species that only occur in southern Madagascar. Thousands of illegally collected tortoises are confiscated each year by government officials. These tortoises are often maintained under poor conditions and receive little care because the needs and requirements of the species in captivity are unknown and proper housing facilities are unavailable. Sadly, many tortoises perish under these conditions. The aim of this training program is to teach wildlife agents to properly care for these species in captivity, facilitate the development of proper holding facilities at multiple locations, and promote the release of healthy individuals back into the wild where they can contribute to the re-establishment of extinct populations and bolster small populations that have been depleted by the illegal trade.

This manual provides information on species identification, threats to tortoise conservation, domestic and international laws that protect them, the roles and responsibilities of those charged with enforcing the laws, confiscations and triage, husbandry protocols for caring for tortoises while in temporary holding facilities, and contact details for people that can provide in-country support for assisting reintroductions. The workshop was designed to share this information with agencies and individuals that are responsible
for conducting seizures of illegally collected Radiated and Spider Tortoises and for their care when being temporarily housed, in order to promote their survival and return to the wild.

The outcomes of the workshop will include a trained workforce that will be equipped to handle the challenges associated with caring for tortoises in captivity and a network that is able to provide support to them, a team of professionals that will be informed and able to communicate the laws that protect tortoises and enforce them, information on the establishment of rescue centers, and local ambassadors for the conservation of Radiated and Spider Tortoises. Through discussions during the workshop, the manual and workshop content will be modified according to the additional needs of the participants.

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We sincerely thank these organizations for their support and hope that this program will facilitate the conservation of Radiated and Spider Tortoises now and into the future.

Sincerely,

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Christina Castellano, Director of Turtle Conservation, TOS

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Species Identification

Radiated Tortoise (*Astrochelys radiata*)

- Large, domed shell up to 30 cm long.
- Heavy, can weigh more than 10 kilograms.
- Top part of shell is black with yellow lines.
- Bottom part of shell is yellow with black blotches.

Notes:
Species Identification

Spider Tortoise (Pyxis arachnoides)

- Small, domed shell that is up to 15 cm long.
- Light-weight, up to 600 grams.
- Light-colored top shell with black patterns.
- Light-colored bottom shell with some or no black blotches.
- Some movement of the bottom shell.

Notes:
Subspecies Identification for Spider Tortoises

Northern Spider  
*Pyxis a. brygooi*  
No Anterior Hinge  
Tan Plastron

Common Spider  
*Pyxis a. arachnoides*  
Flexible Anterior Hinge  
Tan Plastron

Southern Spider  
*Pyxis a. oblonga*  
Flexible Anterior Hinge  
Black Marks on Plastron

There are three forms of Spider Tortoise: Northern, Common (or central), and Southern. These forms vary in flexibility and coloration of the plastron.
Species Distribution

*Radiated and Spider Tortoises only live in southern Madagascar.*

Range Contraction in the Radiated Tortoise over the last 140 years

(Figure courtesy of R. Walker, in press.)
Current Range for the Spider Tortoise

(Figure courtesy of R. Walker, in press.)

9
Threats to Tortoise Populations

- Habitat loss – Land-clearing, bush fires, and livestock grazing.
- Invasive plants – Opuntia and sisal plantations.
- Deterioration of tradition – Changes in practices and non-observance by outside tribes.

- **Collection for food** – Local consumption.
- **Collection for the pet trade** – Domestic and international

Radiated tortoises collected for pet trade.

Radiated tortoise meat prepared for transport and sale.
Tortoise Trade Routes

**Main markets:** Toliara, Bezaha (Betioky and Tongobory), Fotadrevo, Ampanihy, Tranoroa, and Taolagnaro.

**Local markets:** Itampolo, Androka, Beloha and Tsiombe.

(Courtesy of T. Ramahaleo and M. Virah-Sawmy, in press.)
National and International Laws that Protect Tortoises

It is illegal to collect Malagasy tortoises from the wild to supply food markets and the pet trade.

Domestic Laws

- Region laws, or Dinas
- **National laws** Article 60-126, 2005-018 and 2006-400. Prohibits tortoise consumption as well as collection and consumption of tortoises' eggs.
- **National Listings** Category I Class I. Both species are fully protected by the Republic of Madagascar and can not be collected, hunted or kept in captivity without permission from the government.

International Laws

- **Critically Endangered** on the IUCN Red List of Threatened Species: Promotes their conservation by highlighting their conservation status.
- **Appendix I** of the Convention on International Trade in Endangered Species (CITES): Prevents international trade of these species for commercial purposes, but not conservation or research purposes.

Punishments for Breaking these Laws
List Roles and Responsibilities in Tortoise Confiscations (activity)

Local Communities
  •

Gendarmes
  •

Forestry Agents
  •

Madagascar National Parks (MNP)
  •

Justice Department
  •

Minister for the Environment
  •
Confiscations and Triage

*Factors to consider when transporting tortoises:*

- Appropriate transport boxes
- Avoiding temperature extremes
- Limiting exposure to the environment
- Determining the health status
- Preventing dehydration
- Providing food during transport
- Providing food and water upon arrival
- Quarantine

Transport boxes should provide enough space, have holes for air circulation and can be cleaned easily.
Placing tortoises in tubs with a few inches of water will encourage them to drink.

Tortoises that feel light, are slow moving, and do not open their eyes may be sick or dehydrated.
Housing and Pen Construction

Select housing location based on the natural requirements of the tortoises and the factors listed below:

- House tortoises in outdoor enclosures when possible.
- Use appropriate building materials (see example below).
- Provide appropriate substrate.
- Consider security to prevent thefts.
- Pens should be as large as possible to prevent overcrowding and stress.
- One tortoise per 2m² area is the recommended density for Radiated Tortoises.
- One tortoise per 1m² area is the recommended density for Spider Tortoises.
- Provide protection from predators (e.g., fencing).
- Ensure access to sunlight and shade.
- Provide shelters to reduce exposure to weather.
- Include areas where they can graze naturally.
- Provide access to water.
Well-built tortoise enclosure at the Village de Tortue, Ifaty that provide security from theft and predation.

A simple enclosure built for temporary holding of tortoises.
Feeding and Watering Tortoises in Pens

*Radiated and Spider tortoises eat a variety of plants.*

- Provide natural food items (see examples).
- Offer food in the morning before the heat of the day.
- Offer food 5-7 times per week.
- Remove uneaten food daily and discard.
- Occasionally purchase greens from market if tortoises will be held for a long period of time.
- Provide fresh water in bowls and tubs that they can climb into and stand in while drinking.
- Remove dirty water and replace with fresh water daily.
Collecting Naturally Available Food

Plants consumed by tortoises in the wild include:

*Crassula humbertii*, leaves

*Alluaudia comosa*, leaves and flowers
Combretum grandidieri, leaves

Bauhinia grandidieri, leaves
Eragrostis ciliaris, leaves and stems

Euphorbia stenoclada, leaves
Opuntia indica, leaves and fruit

Cynodon dactylon, leaves and stem

(Photos courtesy of the Missouri Botanical Gardens)
Preparation of Cactus Pads and Fruits

- When available offer cactus pads that are spineless.
- Sub adult and adult Radiated Tortoises can easily consume thicker cactus pads.
- Younger Radiated and all Spider Tortoises should receive the new growth cactus pads as those are easier to consume.
- If the spineless variety is not available attempt to remove as many of the spines as possible. Roasting the pads over a fire will make the spines easier to remove.
- Scrubbing the pads with a sponge will remove many of the finer spines.
- Fruits can be offered whole to sub adult and adult Radiated Tortoises.
- Fruits will need to be cut open diagonally for smaller tortoises to consume.
- Cultivating the spineless variety should be attempted near permanent holding pens to make it easier for food collection.
Collecting Information on Confiscated Tortoises

*Information important for tracking individuals, reporting frequency of confiscations, and size of seizures include:*

- Date of confiscation
- Location of confiscation
- Person/agency that conducted the confiscation
- Type (Radiated and/or Spider Tortoise)
- Origin of tortoises if known
- Number of tortoises of each type
- Size of tortoise (small vs. large)
- Individual identification number (Marking with paint (below) or file)
- Final disposition of tortoises
Reintroduction of Confiscated Tortoises

Confiscation tortoises can contribute to the survival of Radiated and Spider Tortoises in the wild.

- Re-establishment of locally extinct populations
- Bolster depleted populations
- Add to future generations
- Opportunity for raising public awareness
- Community benefits through participation
- Criteria for reintroduction sites

Radiated Tortoises being released back into the wild by the community at Ampotaka.
Procedures for Transferring Tortoises to the Wild or Different Holding Facilities

- Instructions
- Contacts
- List release sites
Literature References
