AArk Taxon Management Plan

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BACKGROUND

Species (common/scientific names):

Neurergus microspilotus

Kurdistan spotted newt
Kurdistan newt
Yellow spotted newt

Range :

Found in Iran at the border with Iraq (mainly in the Zagros Mountains, Kermanshah Province; also in Kurdistan Province and central Zagros Province). It has been reported from north-eastern Iraq, and southeastern Turkey (Rastegar-Pouyani 2006).

Distribution:

In Iran *N. microspilotus* is found in four streams. It occurs within a legally protected area, the Zagrosian Oak Forest (Sharifi et al. 2008). *Neurergus microspilotus* is found in southern and northern streams in the same catchment. In the south they are found in two streams at higher elevation and in colder climate. In more northern area streams are located in a warmer climate. Warmer climate in northern part of area is resulted from infiltration of warm air parcels from Northern Mesopotamian plain into Zagros Heights.

Habitat:

In Kermanshah this species occurs at elevations of 1,200-1,800 m asl. *Neurergus microspilotus* is present in shallow, clear montane brooks and streams within deep montane valleys (Rastegar-Pouyani 2006), particularly streams with a pebble substrate (Sharifi and Assadian 2004).

Conservation status (IUCN, CITES other):

Critically Endangered (CR) in the IUCN Red List of threatened species (2008)
CITES: Not listed

Threats:

The main immediate threat to the population of *N. microspilotus* is reduction of the small amount of suitable habitat in Iran through water extraction, grazing, drainage and pollution including pesticides and fertilisers. The remaining small relict populations may be subject to loss of genetic variation. Medium term threats include unpredictable effects of climate change and novel diseases.

Proposed *ex situ* roles (Ark; Rescue; Supplementation; Research; Education):

Rescue/rehabitation/research/education

Husbandry guidelines (Y/N, if yes give details and/or hyperlink):

Yes – as for *N. kaiseri*. published in 2009, H. Olsson and R. Gibson eds. Available on AArk website: www.amphibianark.org and EAZA website www.eaza.net

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The program will be managed within the guidelines of the Taxon Management Plan and under the concensus of the *N. microspilotus* Taxon Management Group through web debate and discussions, meetings or similar communications.

Programme Goal:

A mandate of this taxon management plan is the harnessing of the considerable background and expertise found in Iran, Europe and globally to develop a model conservation breeding program for *N. microspilotus*. This adaptive model will provide for conservation breeding programs for other endangered amphibians.

- Survey and monitor populations in concert with genetic assessment and gene banking.
- Establish and maintain genetically representative and secure conservation breeding population.
- Build a web 2.0 information and communication base (with privates).
- Develop husbandry techniques for long term captive maintenance and reproduction (zoos privates).
- Develop improved methods for cryopreservation of *Neurergus* sperm and other cells.
- Develop a network of both professional and private expertise to support the conservation of *N. microspilotus (*zoos/privates*)*.
- Maintain educational exhibits to particularly draw attention to the conservation of Iranian and other European/Western Asian amphibians.
- To improve husbandry and in particular link conservation breeding programs in Iran and those in private/zoo collections.
- Increase protection and management of suitable habitat.
- Engage the possible rehabitation of the extirpated population at the Ghorighalah Cave and the emerging stream.
- Generally support in-country *ex situ* and *in situ* conservation and research initiatives.

ACTION PLAN

***Ex situ* population management**

Current population (no. of individuals and/or institutions):

- Rescue role – 9 at Razi University.
- Education role – none.

Target population (no. of individuals and/or institutions):

- Rescue role - 25.25 divided between two or more institutions in Iran.
- Education role – no target, surplus animals generated by Rescue programme.

Objectives (clearly defined and measurable):

- In general this taxon management plan will harness the considerable background and expertise found in Iran, Europe and globally to develop a model conservation breeding program for *N*. *microspilotus*.
- All *N*. *microspilotus* brought to the international arena will be bred in captivity and subject to MOU with guidelines for management and in particular to prevent their distribution to the pet trade.
- In concert with surveys; 1) build the existing conservation breeding population at Razi University, Iran, 2) take samples for genetic assessment, and 3) gene bank sperm and other cells.
- Taxon coordinator making annual recommendations for the management of the species to all participating collections – including breeding/culling/surplusing instructions.
- Multiple additional collections worldwide holding small non-programme populations for Educational, Research and fund-raising roles.

Proposed actions and respective time frames:

2010:

- Survey all locations in spring for *N*. *microspilotus* – especially currently identified potential streams.
- Build the existing conservation breeding population to 25:25 at Razi University, Iran.
- Take genetic samples for identification of sub-populations.
- Capacity building and program development in Iran based at Razi University.
- Identify partner EAZA institutions/private breeders/institutions outside EAZA with expertise and suitable quarantine to research reproduction, husbandry, and disease susceptibility and management.
- Transfer current surplus F1 newts to Antwerp Zoo, for dispersal to other international contributers.
- Build out of range populations for research.

2011:

- Continue surveys with sampling for genetic assessment.
- Conduct genetic assessment.
- Test the susceptibility of *N*. *microspilotus* for chytrid.
- Assist in establishment of in-country facilities and training of personnel.
- Identify other collections wishing to develop educational/research or fundraising exhibits of this species.

2012

- Further build the conservation breeding population to represent any genetic sub-populations.
- Identify other collections wishing to develop educational/research or fundraising exhibits of this species.
- Establish a second conservation breeding population in a separate institution.
- Gene bank sperm and other cells.

Ex situ Research

Current research objectives and expected time frames:

None

Proposed research objectives and expected time frames:

1. Develop husbandry:
1.1 - Reproduction to F2 stage - 2010-2013.
1.2 - High larval survival – 20010 -.
1.3 - Terrestrial vs. aquatic systems 2010-2013.

2. Assess genetic sub-populations – 2010-2012.
3. Test susceptibility to chytrid and optimise treatments – 2010-2011.
4. Study cryobiology of gene banking of sperm and other cells - 2010-2012.
5. Test fitness of genetic sub-populations to environmental variables - 2012 - 2014.
6. Test survival on release - 2011-2016.

Actions necessary to meet research objectives:

1. Develop husbandry:
1.1 - Reproduction to F2 stage – identify collaborating expert breeders and supply *N. microspilotus*.
1.2 - High larval survival - identify collaborating expert breeders and supply *N. microspilotus*.
1.3 - Terrestrial vs. aquatic systems - identify collaborating expert breeders and supply *N. microspilotus*.
2. Assess genetic sub-populations (see Collaborations).
3. Test susceptibility to chytrid and optimise treatments - University of Ghent, chtyrid program (see Collaborations).
4. Study cryobiology of gene banking of sperm and other cells – Biophysics Institute, Pushchino, Russia (see Collaborations) – supply *N. kaiseri* as surrogate species.
5. Test fitness of genetic sub-populations to environmental variables – Razi University, other institutions and privates.
6. Test survival on release – Razi University, raise larvae, juveniles and monitor survival.

Ex situ Education

Educational message:

The Yellow spotted newt (*N. microspilotus*) is typical of many amphibian species that exist in small isolated watersheds. Its small range in a developing region, along with climate change and threat from disease, requires a pro-active approach to assure its survival. In contrast to many other species such as Mantellas where 70m of 112 species were lost *N. microspilotus* offers the opportunity to provide a model program for species perpetuation. This program includes the rehabitation of *N. microspilotus* in a high profile tourism site.

Objectives (clearly defined and measurable):

- Visitors to zoos/aquariums viewing *N. microspilotus* understand their rarity and special conservation needs.
- The role of conservation breeding programs in assuring species survival is exemplified.
- Institutions and individuals from many nations and with many special skills work together for

the conservation of *N*. *microspilotus*.

- Visitors understand that habitat loss, chytrid fungus and climate change are the two greatest threats to the worlds 6000+ amphibian species.
- A wide variety of approaches from habitat protection and rehabilitiation, conservation breeding, genetic assessment and gene banking can in concert provide a powerful conservation umbrella to protect *N*. *microspilotus*.

Proposed actions to meet above Educational Objectives with time frame:

- Taxon coordinator to:

  1) Prepare a species profile with accurate and updated information to provide information for education needs.

  2) Collate and provide images for AArk website.

  3) Collaborate and liaison with *N*. *kaiseri* project.

  4) Provide PPT presentation material through AArk website.

  5) Support eco-tourism/educational activities in Iran based on amphibian and habitat conservation in the region inhabited by *N*. *microspilotus*.

Any other information:

In-country/field initiatives

Current/supportive activities:

Surveys were conducted in the past, and recent surveys in spring 2009.
Genetic studies of the *Neurergus* clade have been completed.
Reproductive cycle has been investigated from wild caught individuals.

Objectives (clearly defined and measurable):

- Thorough understanding of species conservation biology.
- Adequate, continuous, protected habitat capable of sustaining a long-term viable population.
- Enhanced local knowledge and understanding supporting conservation.

Proposed actions and respective time frames:

- Conduct thorough field surveys to complete distribution data and elicdiate conservation biology.
- f practical, rehabitate *N*. *microspilotus* at the Ghorighalah Cave and the emerging stream
- Perform P(H)VA for species
- Design and implement a local education and awareness programme.

Long term goal (exit strategy):

If all genetic sub-populations of *N*. *microspilotus* are identified and current habitat protected and

possibly expanded – including rehabitation at Ghorighalah Cave and the emerging stream, with assurance against disaster through a minimal conservation breeding population supported by gene banking the conservation breeding program can be downsized. The developed amphibian conservation capacity can be reprogrammed for other endangered regional amphibians.

Collaborators:

Conservation breeding populations - Rescue:

- Prof. Nasrullah Rastegar-Pouyani; Prof. Mozafar Sharifi, Department of Biology, Faculty of Science, Razi University, Iran.

Conservation breeding populations - Research/Education/Display:

NB: To be managed under Memorandum of Understandings, through the TMG.

- Herpetology Department; Center for Research and Conservation, Antwerp Zoo, Belgium.

- Sergé Bogaerts, Schultschik Günter, Jennifer Macke and Frank Pasmans are expert in the husbandry of *Neurergus* spp. and .

- European zoos and privates within the EAZA participating region.

- German zoo directors, and the DGHT (German organization for the study of reptiles and amphibians).

Chyrid Research:

- Prof. Frank Pasmans, Division of Poultry, Exotic Companion and Laboratory Animals, Laboratory of Veterinary Bacteriology and Mycology, Department of Pathology, Bacteriology and Avian Diseases, Faculty of Veterinary Medicine, Ghent University, Belgium.

Prof. Pasman is leading a major European Initiative to study Chytrid infectivity, susceptibility, and treatment. See Bibliography: lead authors, Bogaerts, Pasmans.

- Center for Research and Conservation, Antwerp Zoo, Belgium.

The Center is financing and co-supervising a PhD project on the treatment of Chytrid with Prof. Pasmans, Ghent University.

Cryobiology:

- Dr. Edith N. Gakhova, Head of Laboratory of Genetic Resource Cryopreservation, Institute of Cell Biophysics RAS, Pushchino of Moscow Region, 142290, Russia.

- Dr. Victor K. Uteshev, Laboratory of Genetic Resource Cryopreservation, Institute of Cell Biophysics RAS, Pushchino of Moscow Region, 142290, Russia.

  See Bibliography: lead authors - Gakhova EN, Uteshev VK, Kaurova S. A."

Genetics:

- Consultation with genetics will initially be with population geneticists Dr Jill Shephard and Dr Peter Galbusera, Center for Research and Conservation, Antwerp Zoo, Belgium.

Population Management.

- Dr Kristin Leus, EAZA Population Management Advisor, CBSG Europe Programme Officer - Copenhagen Zoo ; Center for Research and Conservation, Antwerp Zoo, Belgium.

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