CONSERVATION ASSESSMENT AND MANAGEMENT PLAN (CAMP) FOR THE THREATENED FAUNA OF ARABIA'S MOUNTAIN HABITAT

9-14 FEBRUARY 2002

BREEDING CENTER FOR ENDANGERED ARABIAN WILDLIFE

SHARJAH-UAE

الحيوانات الجبلية المهددة بالانقراض في شبه الجزيرة العربية

الشارقة - الامارات العربية المتحدة

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EAZA

CAT SPECIALIST GROUP

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مركز حيوانات شبه الجزيرة العربية
المهددة بالانقراض
الشارقة

BREEDING CENTER
FOR ENDANGERED ARABIAN WILDLIFE
SHARJAH

FINAL REPORT

Conservation Assessment and Management Plan (CAMP)

for

THE THREATENED FAUNA OF ARABIA'S MOUNTAIN HABITAT

Final Report

Conservation Assessment and Management Plan (CAMP)

for

THE THREATENED FAUNA OF ARABIA'S MOUNTAIN HABITAT

Facilitated by the IUCN/SSC Conservation Breeding Specialist Group

Master map originally provided by Environmental Research and Wildlife Development Agency, edited and adapted by Breeding Centre for Endangered Arabian Wildlife, EPAA.

Environment and Protected Areas Authority (EPAA). 2002. ***Conservation Assessment and Management Plan (CAMP) for the Threatened Fauna of Arabia's Mountain Habitat***. BCEAW/EPAA; Sharjah; UAE

Additional copies of ***Conservation Assessment and Management Plan for the Threatened fauna of Arabia's Mountain Habitat*** can be ordered from **The Breeding Centre for Endangered Arabian Wildlife; PO Box 24395; Sharjah; United Arab Emirates.**

2002

Conservation Assessment and Management Plan (CAMP)

for

THE THREATENED FAUNA OF ARABIA'S MOUNTAIN HABITAT

CONTENTS

Executive Summary

Conservation Assessment and Management Plan Workshop 2002

Section 1

The Threatened Fauna of Arabia's Mountain Habitat CAMP Workshop 2002

Seldom remembered and considered of little interest are the fish species also found thriving within the mountain habitat. Freshwater fish are an important, often forgotten component of regional biodiversity and for this reason the CAMP Workshop; hosted by the Environment and Protected Areas Authority, Sharjah included experts able to assess these invisible vertebrates. The workshop was held at the Breeding Centre for Endangered Arabian Wildlife, Sharjah from the 10th to the 14th of February 2002 and also expanded on work begun during previous workshops concerning prominent mammalian species.

Our host, Mr. Abdul Aziz Al Midfa, opened the workshop with a welcome address at Arabia's Wildlife Centre on Sunday morning, the 10th of February 2002. The workshop was initiated with an overview of CBSG and the CAMP workshop process. Four working groups were formed to cover the taxa under discussion: **Freshwater Fish of Arabia**, **Arabian leopard and caracal**, **Arabian tahr and Nubian ibex** and **mountain gazelle**. During the CAMP workshop the detailed species information was analysed and entered onto Taxon Data Sheets, which are included in the relevant sections of this report. This information was entered into a database programme compiled by the CBSG office for analysis and ultimate submission to the IUCN Red List Officer who will review and include the information in the next edition of the Red List.

During the short time the workshop was in progress, the newly formed fish group had the daunting task of analyzing the available scientific and general literature of the 20 different species occurring in Arabia. They successfully completed taxon data sheets for each species under consideration and were able to establish nine basic initiatives for the conservation of many of these species. There is concern that some fish species are under threat of rapid extinction as a result of increased human impact and the group felt that standardized field assessment surveys are a high priority for immediate action throughout the region.
The participation of Dr. Fareed Krupp was a great benefit to the group as he was able to contribute his extensive knowledge of the fish of the region gained over more than 20 years of research. The presentations given by Fareed Krupp on the freshwater fish of the Arabian Peninsula and by Nashat Hamidan on the reintroduction research project conducted at the Royal Society for the Conservation of Nature, Jordan provided new and exciting insight for workshop participants from all fields of expertise. The interest shown in the fish species of Arabia is encouraging and can only lead to positive results.

Obtaining positive results proved to be the main focus and objective of all the discussion groups at the workshop. Following a review of existing data, the Cat Group compiled updated taxon data sheets for the Arabian caracal and the Arabian leopard. Only once consensus was reached by the group members that the true status of the cats in the wild was accurately reflected did the group of regional and international felid experts review the progress of the actions proposed for the Arabian leopard during their last meeting in 2001. Alarmingly, there was very little positive feedback to report. This group clearly had many unresolved issues to discuss between the representatives of the different countries and entered an exciting and dynamic phase in the conservation of the very rare and highly endangered Arabian leopard.
Considered a useful tool within the group was the development of an Internet chat group where information and ideas can be exchanged; where previously non-existent contact can be established. It now remains the responsibility of each member of the group to maintain increased cooperation.

A major issue for the Arabian Gazelle Action Group remained the confusion surrounding the many named subspecies and the different forms and colour variants occurring within the species. Genetic research at King Khalid Wildlife Research Centre has made some progress towards identifying

distinctive types but it was generally felt that until the research at KKWRC has been completed, little emphasis should be placed on examining the species in great detail. The proposed goal of establishing an agreed taxonomy of the mountain gazelle will be fulfilled by cooperation of all range states in providing genetic samples to the KKWRC laboratories for analysis. In return, the laboratory will provide completed results to all concerned institutions to help identify populations in need of immediate action. Gazelle.net was re-launched to improve communication between group members and ensure that group members are able to keep abreast of new findings/policies. Because of the wide distribution of these ungulates, and the diverse habitat they occupy, the group found unanimous decisions very difficult to achieve. The main emphasis therefore for building future conservation programs was based on three problem statements/goals: 1) Establishment of an agreed taxonomy; 2) A common, workable and coordinated ecosystem-based strategy for their conservation and 3) Prevention of the direct loss of the mountain gazelle.

The Arabian Tahr and Nubian Ibex were considered together in one action group. Again, there was grave concern among the participants over the lack of progress since CAMP 2001.The group definitely felt that a lack of awareness of wildlife issues among both the public and enforcement officials needs improvement and have dedicated themselves to establishing a strategy for wildlife education, public awareness and local involvement. As with many species occurring on the Arabian Peninsula, there is a lack of recent, reliable data on Tahr and Ibex. The action group has also proposed collection and collation of information and hopes to improve relations between participating institutions through increased data sharing.

Cat Group Report

The captive management group of the Arabian leopard met again prior to the CAMP workshop to discuss the management of the captive population. The studbook 2001 was printed and distributed.

At the CAMP workshop, the group started with reviewing the taxon datasheets for the Arabian caracal and the Arabian leopard. For the caracal many of the questions had to be filled in with unknown. The subspecies was classified as vulnerable under the criteria of population estimates. There was a gut feeling in the group that the population is declining as the habitat loses quality. There is no data to support this feeling.

There were no major changes in the taxon datasheet for the Arabian leopard. New laws also concerning the leopard were implemented in Oman, KSA and Kuwait during 2001. A possible new occurrence in Yemen was announced in Bora, but with no further information on the extent. Information on trade was provided: a young female was sold on the black market from Yemen to Saudi Arabia in April 2001. During summer 2001; 4 wild caught animals from Yemen were sold, 2 to Saudi Arabia and 2 to an unknown destination.

The threats defined in 2001 were reviewed. The priorities were rearranged and two threats identified last year were now placed under problems. The 2001 goals were discussed and three more points were added. In the process of the pair-wise ranking the goals were then prioritized with an overall goal put ahead:

Secure a viable population of Arabian leopards in its historic range.

1) Gain information on distribution and ecology of the Arabian leopard;
2) Implement a coordinated conservation strategy
3) Secure the prey base of Arabian leopards
4) Improve law enforcement
5) Define target groups for public awareness campaigns
6) Develop community assistance
7) Secure legal protection for the Arabian leopard
8) Limit increase of livestock with the following two sub-goals:
    a) Enforce exclusion of livestock from core areas of protected areas
    b) Change subsidy system for livestock in protected areas

The actions of 2001 were then reviewed and the progress assessed: very little has been achieved; most of the actions still need to be done:

- form an Arabian leopard working group within each country within the next six months;
- establish an email list to ensure communication;
- include references on the Arabian leopard in the IUCN/SSC Cat SG online library;
- produce a country-wise status report on the Arabian leopard that will be compiled into a common publication;
- exchange public awareness material and information on activities between the ALWGs as soon as they are established in all countries.

Gazelle Group Report

A Taxon Data Sheet for the species as a whole was completed from the beginning to introduce the new members of the group to this process. There were no major changes but a few amendments were made.

In the light of new information: based on best estimates the population is 20-25,000 overall, but the situation is not uniform across the range: numbers in some countries are increasing, in others decreasing and others are stable.

A major issue remained the confusion between many named subspecies, other forms and colour variants within the species. Genetic research at KKRWC has made some progress towards identifying distinctive types and it was agreed there was no point in looking again in detail at the four subspecies that were considered in 2001 until relationships between various named forms within the species as a whole had been clarified. The ongoing research at KKWRC is expected to provide a final answer to this problem and will enable key conservation units in the Arabian Peninsula to be identified and priorities assigned.

Threats: There was a wide range of views on the most significant threats facing the species and reaching a consensus on several aspects was complicated by the fact that the situation varied widely across the region. For example, decline in habitat quality was seen as less of a problem in Yemen than elsewhere. Invasion of rangelands by exotic plants affected parts of Saudi Arabia. Hybridization and escape/release of animals of unknown origin were factors in UAE.

The problems identified included:

- Habitat Loss (agricultural/pastoral practices, soil erosion, overgrazing, mineral exploration/exploitation, uncontrolled tourism, military activity, drought).
- Direct Loss (hunting, trade, private collections/mismanagement, disease, urbanization/settlements, pollution).
- Lack of Knowledge (lack of awareness, lack of interest, identification techniques, lack of education).
- Lack of Resources (human and financial). Legal (inadequate legal framework, no regional strategy, lack of co-operation).
- Taxonomy (genetic/taxonomic confusion).

Following two paired ranking exercises; the threats were listed in the following order:

1. Genetics.
2. Legal.
3. Direct loss.
4. Knowledge.
5. Resources.
6. Habitat Loss.

Progress since the 2001 CAMP was reviewed. The taxonomic work at KKWRC had not been completed, as had been hoped, but results of genetic analysis of animals in two local collections had been received. The email group (gazelle-net) had not operated and would be relaunched after this CAMP with an expanded number of members. Further field surveys and monitoring in Saudi Arabia had been carried out. The IUCN Antelope Action Plan Part 4 was published in July 2001 and contained summaries of gazelle status in all countries of the region.

Nubian Ibex Group Report

Representatives from the Sultanate of Oman, Yemen, the Kingdom of Saudi Arabia, the UAE and Jordan reviewed available information on the Nubian ibex (C*apra ibex nubiana*) and concluded that most of the population appears well protected and in no imminent danger, however data is lacking for certain populations.

Generally, there seems to be a lack of detailed knowledge of current trends in animal losses and habitat loss/degeneration, but inference and educated guesses were made by members; in whose country the ibex occurs. Threats identified included human disturbance like oil exploration and military exercises, hunting, competition from domestic livestock and drought. Their vulnerability also increases with migration of individuals to urban areas in search of water. In the Sultanate of Oman ibex numbers are fairly stable, but in KSA and particularly Yemen, threats were more evident, so overall a steady decline in population numbers was predicted.

The Sultanate of Oman proposed no particular action at this time, but Yemen agreed to promote a plan of public awareness to educate and make local people in ibex areas aware of wildlife conservation issues. KSA also agreed to intensify their already existing public awareness programme. Yemen will try and relieve human and livestock pressure on mountain water sources to try and prevent ibex migrating to urban areas in search of water, where they run the risk of being killed on the roads, contracting diseases from domestic livestock and hybridising with goats. The group also agreed to amass data on captive and wild populations of ibex at the next CAMP meeting, to promote a more coordinated conservation plan.

Arabian Tahr Group Report

Previous plans and actions on the Arabian tahr (*Hemitragus jayakari*) were reviewed by representatives from the Sultanate of Oman, Yemen, Kingdom of Saudi Arabia, United Arab Emirates and Jordan. Taxon data sheets were updated and the CAMP assessment procedures were followed to ascertain current priority issues affecting the future of tahr populations.

There was concern over the lack of progress since CAMP 2001 (due to factors beyond the control of the participants), and a realisation that limited evidence showed that tahr numbers were at least stable in most parts of the range, but had declined in some areas. However, more information is still needed on tahr numbers and habitat status, which will hopefully be achieved through collaborative surveys in unprotected areas. Furthermore, due to concerns of uncontrolled hunting and poaching in unprotected areas of tahr range, recommendations will be made to the relevant authorities for stronger law enforcement in these areas, as well as the proclamation of more Royal Decree protected areas.

The group also felt that there was not enough awareness of wildlife issues among the public in general, and not enough awareness of the urgency of wildlife issues among decision makers. It was proposed to continue the group's previously agreed public awareness poster, but independently by each country (Oman and the UAE). Furthermore, delegates representing the conservation institutions in each country will attempt to alert senior decision makers to the needs of wildlife and the Arabian tahr in particular, through a series of letters to these relevant authorities within their own and other's organizations.

The goals at this CAMP were kept as low key as possible, in order that they may be more quickly achievable, and hopefully provide a basis for more ambitious plans in the future to preserve the Arabian tahr in both the wild and captivity.

Freshwater Fish Group Executive Summary

The Fish Group met for the first time to evaluate the current state of knowledge of the comparatively little known freshwater fish fauna of the Arabian Peninsula. The freshwater fishes are often considered to be un-charismatic and of little interest. However, a strong recognition emerged from the Group that freshwater fishes are an important component of regional biodiversity, which must be conserved. The newly formed Fish Group was not in a position to formulate a comprehensive conservation strategy or provide a detailed action plan with goals within the time available. Nevertheless, nine separate conservation actions were recommended which could reasonably be progressed before the next workshop meeting in 2003. The 16 members of the Fish Group included representatives from governmental and non-governmental agencies in the region and there were external participants with taxonomic, ecological, geographical, piscicultural and other relevant expertise. While the geographical coverage provided by the representatives is broad, there is a need for Yemen to be included in further group meetings, in view of its substantial list of freshwater fishes, including several endemic species. Jordan should also continue to be represented, from its two freshwater fish species, which have Arabian Peninsular affinities. However, on good zoogeographical grounds, the remaining 16 Jordanian species are not considered to be a characteristic Arabian peninsular ichthyofauna, and so were excluded from the present analysis.

Fareed Krupp and Nashat Hamidan gave presentations in the plenary sessions on the status and significance of the peninsular ichthyofauna. The Fish Group then reviewed the available scientific and general literature - which, while often of good quality, is rather sparse and often 10-30 or more years old. On the basis of this review, the best current estimate is that there are 20 freshwater fish

species existing in the Arabian Peninsula, with cyprinid or "carp-like" taxa predominant. A draft checklist is attached and available data were compiled in individual taxon data sheets.

There have been few recent field surveys of natural freshwater habitats (many of which are now known to be under a high level of threat from human impacts) and there is a justified concern that some fish species or populations may be in severe decline - or perhaps in some cases extinct, or on the verge of extinction. To clarify this issue, rapid field assessment surveys are a high priority for immediate action throughout the region. The precise taxonomic status of some species, subspecies and populations remains obscure. Hence, new surveys should, where possible, combine traditional taxonomic and ecological methods with contemporary techniques for genetic analysis of populations, such as micro-satellite DNA sampling.

The group discussed the status of certain high profile species evidently under threat and including: the cyprinids *Acanthobrama hadiyanhensis*, *Barbus exulatus*, *Garra dunsirei*, *G. ghorensis*, *G. longipinnis*; and the cyprinodont *Aphanius sirhani*. Of particular interest is the Omani blind cave fish (a subterranean form of *Garra barreimiae*) .
The main threats to freshwater fishes in the region were itemized, notably including drought, habitat destruction and habitat fragmentation and the introduction of alien invasive species such as *Tilapia*, which may out-compete and displace the indigenous fish fauna. The Group developed formal 'problem statements' regarding threats, conservation strategies, research and documentation priorities, legislation requirements, education and awareness issues, and the great overarching need for regional cooperation to protect the freshwater fishes of the Arabian Peninsula.

Recommendations for conservation

Since the freshwater fish fauna of the Arabian Peninsula had not previously been included in the Conservation Assessment and Management Plan (CAMP) process, it was not possible to set out a detailed strategy and specific goals for the 20 species presently recognised. Instead, the Fish Group drew up a list of recommended actions, which are thought to be achievable before the next CAMP workshop in 2003.

1. *Field surveys should be conducted in order to obtain recent data on the distribution of all freshwater fish species. The Group considered certain fish species to be a particularly high priority, because of a dearth of up-to-date information, coupled with concerns about adverse changes to their habitats (list attached).*

2. *The Group identified the need to standardise field survey techniques and Fareed Krupp undertook to provide a standard field survey protocol to be distributed to interested parties by the Breeding Centre for Endangered Arabian Wildlife, Sharjah.*

3. *It was agreed that Damien Egan at the BCAEW act as a co-ordinator and collator for field surveys and reports, and specimens collected for identification. In all such matters, the intellectual property rights of the contributor or agency would be protected.*

4. *Those Group members representing government agencies or NGOs in the respective countries would seek formal clarification from the relevant authorities that freshwater habitats and freshwater fish are recognised in (and enjoy the full protection of) legislation concerning wildlife and the environment per country.*

5. *The Group recommends that, where possible, the scientific names of indigenous freshwater fish be included as a schedule in by-laws or executive orders under wildlife or environmental protection legislation. In this regard, the group welcomed the kind offer from the Yemeni delegate Mr Naji Saleh Thowabeh to incorporate freshwater fish species in Yemeni by-laws currently being developed.*

6. *Group members in parts of the UAE with responsibility for mosquito vector control using fishes will recommend a moratorium on the use of the potentially invasive indigenous species* Aphanius dispar *as a mosquito larvivore in wadi systems (as distinct from its safe use in irrigation tanks in farms where there is no connection to natural water bodies).*

7. *The potential threat from invasive species posed by existing and future commercial fish farming projects in the region involving exotic taxa requires investigation. Group members will seek to obtain data on existing and proposed projects per country before the next workshop in 2003.*

8. *In view of the importance of the Yemeni contribution to freshwater fish biodiversity in Arabia, it was recommended that a research worker from that country attend the next CAMP workshop. An ichthyologist working at Mukalla University, Dr. Atallah M. Ali, may be available to assist the Group.*

9. *Fish Group members will take steps to secure, maintain and breed captive populations of the fish species for their areas or assist in establishing such 'insurance' populations. Damien Egan of the BCAEW undertook to coordinate such activities, where appropriate.*

What you the delegate expected….

- Learn more about Arabia's Wildlife and get to know the conservationists of the Arabian Peninsula
- Increased collaboration among people and cooperation between countries and institutions.
- To review the status of freshwater fish throughout Arabia; review the status of freshwater ecosystems and introduced species.
- Update knowledge of Arabian Leopard and Caracal; learn about conservation projects in Oman and Yemen.
- To find ways of cooperating and coordinating amongst the different institutions in the Arabian Peninsula.
- Get some experience and exchange my own experiences for data and information. I would like to see what the other countries have in releasing and monitoring.
- To introduce TSC organisation; meet conservation folk in the area.
- To gain knowledge of the species status on the Arabian Peninsula; when knowledge and ideas are shared, there is always accomplishment.
- Re-affirm contacts and create new ones. Creation of solid conservation plans and cooperation.
- To recognise species with which to work in captive breeding programs. Stabilizing wild populations. Public awareness.
- To assist in the identification of specific concrete steps that participants can make for their conservation.
- What is proper management and how can that serve the human needs in society?
- To know the degree of threat of each species as per IUCN. To know the areas of research for better conservation.
- I think we have good information and protection for wildlife in Arabia.
- Improvement in Arabian Tahr conservation in captivity and in the wild.
- Expand my understanding of the richness of Arabia's fauna, particularly fish species. Improved contacts between government agencies with planning authority and groups concerned with environmental issues.
- Exchange information about wildlife animals between the GCC countries.
- To meet colleagues in a similar working environment to establish dialogue and cooperation for the benefit of the animals in our care. I would like to see simple enforcement recommendations, which could be presented to all the sheikhs of UAE for their support; especially tighter controls on hunting and the establishment of hunting free reserves.
- To further links with individuals and institutions which will allow us to carry out the proposals of the CAMP.
- A review of last year's proposals and attempt to put more of them in place.
- To review last year's workshop, looking forward to new plans for 2002, more help between countries for exciting info.
- To seek greater involvement of decision-making bodies within the Arabian Peninsula so that the results of the CAMP process can be implemented throughout the region.
- To find a solution for the captive breeding disadvantages; to forward the interest to the in-situ protection; raise the issue of freshwater fish.
- I want to know everything about wildlife animals because I am interested in this subject.
- To get information about conservation and management of rare animals which is part of my work.
- Meeting people to exchange knowledge and starting cooperation; working out opportunities protecting wildlife; getting information of the current situation.

- I want to know about habitat for these species and also about exchange of information for the survival of this wildlife.
- To increase my knowledge about the wildlife in the Arabian Peninsula and it's habitats; exchange information about these animals and their behaviour.
- A joint movement towards a regional action to conserve mountain wildlife in Arabia.
- Help to conserve Arabian Wildlife all over the Arabian Peninsula.
- I wish to see a field study program started to recognise the status of the different wildlife species discussed.
- Focused "next steps" for each species.
- To achieve a sustainable and feasible mountain action plan; implementation of activities proposed.
- Breeding Arabian mammals concentrating on conservation of the Arabian Gazelle.
- Progress review since CAMP 2001, set new objectives for the selected taxa; learn more about the wildlife biodiversity of Arabia.
- Learn about progress in Arabian Leopard conservation. I would like to see the next steps defined and responsibilities assigned.
- The introduction of cyprinion fish into mosquito control programme of desert village.
- Replacement of tilapia app with new spp (cyprinion and garra) in rural areas of the Dubai Emirate.
- Improve my knowledge about mountain habitats; introduce freshwater fish in Arabian regions.

And in conclusion….

The success of conservation on the Arabian Peninsula undoubtedly falls to the dedication of the range countries of each of the species included in this CAMP workshop; **"The Threatened Fauna of Arabia's Mountain Habitat"**. Conservation requires the dedication of all interested institutions and the foresight to set aside differences in opinion to achieve a common goal. Conservation of a niche will ensure conservation of a healthy population; conservation of many healthy populations will ultimately lead to the conservation of an entire ecosystem and all organisms that coexist within!

Arabian Leopard

Panthera pardus nimr

Conservation Assessment and Management Plan Workshop 2002

Section 2

Cat Group Report

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Scribe: Dr. Christine Breitenmoser

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Cat Working Group Executive Summary

The captive management group of the Arabian leopard met again prior to the CAMP workshop to discuss the management of the captive population. The studbook 2001 was printed and distributed.

At the CAMP workshop, the group started with reviewing the Taxon Data Sheets (TDS) for the Arabian caracal and the Arabian leopard. For the caracal many of the questions had to be filled in with unknown. The subspecies was classified as vulnerable under the criteria of population estimates. There was a gut feeling in the group that the population is declining as the habitat loses quality. There is no data to support this feeling.

There were no major changes in the TDS for the Arabian leopard. New laws concerning the leopard were implemented in Oman, KSA and Kuwait during 2001. A possible new occurrence in Yemen was announced in Bora, but with no further information on the extent. Information on trade was provided: a young female was sold on the black market from Yemen to Saudi Arabia in April 2001. During summer 2001; 4 wild caught animals from Yemen were sold, 2 to Saudi Arabia and 2 to an unknown destination.

The threats defined in 2001 were reviewed. The priorities were rearranged and two threats identified last year were now placed under problems. The 2001 goals were discussed and three more points were added. In the process of the pair wise ranking the goals were then prioritized with an overall goal put ahead:

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7) Secure legal protection for the Arabian leopard
8) Limit increase of livestock with the following two sub-goals:
    c) Enforce exclusion of livestock from core areas of protected areas
    d) Change subsidy system for livestock in protected areas

The actions of 2001 were then reviewed and the progress assessed: very little has been achieved; most of the actions still need to be done:

- Form an Arabian leopard working group within each country within the next six months.
- Establish an email list to ensure communication.
- Include references on the Arabian leopard in the IUCN/SSC Cat SG online library;
- Produce a country-wise status report on the Arabian leopard that will be compiled into a common publication;
- Exchange public awareness material and information on activities between the ALWGs as soon as they are established in all countries.

Report

Threats 2002 (have been rearranged and 5 and 6 were removed from the list of threats, but grouped under problems)

1) Human persecution (poaching by hunters, trade, killing by owners of livestock)
2) Loss of habitat
3) Shortage of wild prey
4) Lack of legislation and enforcement (lack of law enforcement in most countries; free distribution of poison in KSA)

Problems

1) Lack of baseline information (presence/absence)
2) Public awareness

Ranking of 1-3 is region dependent

Goals 2002 (after pair wise ranking in the group)

Overall:

Secure a viable population of Arabian leopards in its historic range

1. Gain information on the distribution and ecology of the Arabian leopard.
2. Coordinated conservation strategy.
3. Secure prey base of Arabian leopard.
4. Improve law enforcement.
5. Define target groups for public awareness campaigns.
6. Develop community assistance.
7. Secure legal protection for the Arabian leopard.
8. Limit increase of livestock:
    a) Enforce exclusion of livestock from core areas of protected areas.
    b) Change subsidy system for livestock in protected areas.

Overview on the legal situation of the Arabian leopard and the prey in the various countries:

Country	Leopard	Prey	Poison
KSA law enforcement	+ -	+ -	- -
Oman law Enforcement	+ +	+ +	+ +
Yemen law Enforcement	+ -	+ -	+ -
UAE law enforcement	+ (-)	+ (-)	- -
Kuwait	+ +	+ +	? ?

Review of Actions 2001

1) Establish Arabian leopard working group in each country
2) Draft a status report
3) Prepare training material for field workers
4) Produce poster for police station and general public
5) Meetings:
    i. ALWG in each country by June 2001
    ii. Advisory group in Sharjah fall 2001
    iii. Workshop on field techniques

Discussion of Actions 2001

1) **KSA**: Leopard working group has been established. They had one meeting, but the field people were not there, although some of them are part of the group.
   Oman: nothing happened yet.
   Yemen: nothing happened yet.
   UAE: no group yet.
2) Not done yet.
3) Provide training material:
   Oman has educated rangers.
   KSA has a training center where education on leopards is offered; no material has been produced.
4) **Yemen**: poster on leopards was distributed
   Oman: no poster. They have a website with a leopard section
   KSA: a poster with 6 species was distributed; the leopard was represented.
   UAE: yes. The original idea was to inform the police stations about the leopard and its legal status, because it was recognized that many people do not know about the laws and the species, the police included.
5) Nothing happened.

GCC: agreement endorsed in December 2001; secretariat with Hany Tatwany. The agreement will be in action after the endorsement process in each country. This agreement will give the legal basis for cross border conservation and cooperation.

Actions 2002

Goal 1: ***Gain information on distribution and ecology of the Arabian leopard***

- Integrate references on Arabian leopards into the online library of the CatSG
- Create an email discussion list (K. Budd)
- Assure the availability of the survey report of KSA from the area north of Medina to the border of Jordan (A. Boug)
- Assure the availability of the survey data from the baboon survey in KSA (A.Boug).
- Prepare training material for field work to ensure standardized data collection:
    - Develop a questionnaire and adapt it to local conditions in a group effort
    - Manual on field techniques; collect samples, document sign of presence, etc (A. Spalton, K. Budd, A. Khoja, Ch. & U. Breitenmoser).
- Field survey techniques workshop for "teachers" to have a multiplying effect (Oman may be able to provide field training for a small number of staff). It should not be a workshop open to the public, only for people doing surveys in their countries.

Goal 2: ***Coordinated conservation strategy***

There was concern in the group that the captive breeding program could wake up "sleeping dogs" among the private collections; we learnt from the Yemen delegates that in Yemen 15-20'000 US $ is offered for a live Arabian leopard. This could have a negative impact on the wild population.
The Arabian Leopard Working Group Committee that has been formed has been created as a political tool for "lobbying and implementing" decisions and actions made by the Arabian Leopard Action Group at the CAMP workshop. This committee met prior to the CAMP Workshop.

- Compile status reports by country (see list of responsible people)
- Form a leopard-working group in Oman, Yemen and UAE within the **next six months** (S. McKeown for UAE, A. Spalton for Oman, Nagi Thowabeh for Yemen).

Responsible people for the country status report:

UAE: Ch. Gross, K. Budd, S. McKeown
Oman: Ali Salem Bait Saed, Andrew Spalton
Yemen: Nagi Thowabeh
KSA: A. Boug, P.Paillat

The drafts for the status reports are to be sent to Urs and Christine Breitenmoser by 30 June 2002. The drafts will be reviewed and a common publication compiled from the information and data provided.

Goal 3: ***Secure prey base of Arabian Leopard***

- Assessments of the livestock management systems by Arabian Leopard Action Group of each country and include it in the status report (end of June 2002).
- Summary of the diet research from Oman will be included in the status report (A. Spalton, 30 June 2002).

Goal 5: ***Define target groups for public awareness campaign***

- Produce a poster for UAE and Yemen (Sharjah Breeding Center).
- Oman will produce a brochure as they did for the Arabian Oryx. They will also soon have a website.
- Exchange public awareness material and activities amongst the Arabian Leopard Action Groups as soon as they are formed.

Goal 7: ***Secure legal protection for the Arabian leopard***

- Organize copies of the GCC agreement on wildlife (A. Boug).

A discussion came up on what to do with confiscated animals. It was proposed that those animals should be released again into the wild with a radio collar if ever possible.

Conservation Assessment Management Plan
Taxon Data Sheet

Panthera pardus nimr **Arabian leopard**

1.Scientific *Panthera pardus nimr*

1A. Synonyms:

Scientific synonym / ambiguities	Authority (date)
Felis nimr	Harrison 1968

1B. Scientific nomenclature:

FAMILY: Felidae
ORDER: Carnivora
CLASS: Mammalia

1C. CommonNames:

al nimr al Arabi	Arabic
Arabian leopard	English
nimr	Arabic
qydhar	Local - Dhofar

1D.Taxonomic level: Subspecies

Notes:

2. Distribution of the Taxon

2A.Life form (plant):

2B. Habitat:

2C. Niche: Mountainous areas (with or without veg.), gravel, plains, forests (Juniper) with permanent water and prey; sea level to 3000 meters with adequate wild and domestic ungulates or hyrax

2D. Historical distrib: Kingdom of Saudi Arabia, United Arab Emirates, Sultanate of Oman and Yemen

2E. Current countries: Kingdom of Saudi Arabia, united Arab Emirates, Sultanate of Oman and Yemen

2F. Geograph. extent: Small numbers in the northeast (Musandam, UAE and Oman), more common in southern Oman (Jebel Al Qara, Al Qamar and Samhan), the Dhofar mountain range,

Yemen (Al Haym, Al Wada north of Sana'a, Al Mahra and mountains north of Aden)

and the west coast of Saudi (Asir, Hijaz ranges)

2G Migration regions:

3. Approximate Area of Occurrence of the taxon in and around the area of study/ sighting/ collection

(Extent of occurrence is defined as the area contained within the shortest continuous imaginary boundary encompassing all known, inferred or projected sites of present occurrence of the taxon)

Occurrence area: > 20,000 sq km

Notes (Occurrence)

4. Approximate Area of Occupancy of the taxon in and around the area of study/ collection

(Area of occupancy is defined as the area occupied by the taxon within the 'extent of occurrence')

Area of Occupancy: > 2,001 sq km

Notes (Occupancy):

5. No. of Locations or Subpopulations in which the taxon is distributed: 5

Is there a continuous declined in subpopulations / locations?

Are there extreme fluctuations in subpopulations/ locations?

Panthera pardus nimr **Arabian leopard**

Notes (subpops) At least 5, possibly as many as 8 or 9

6. Habitat status: Fragmented

6A. Is there any change in the habitat where the taxon occurs? (Yes)

If yes, describe: Decrease in Area

6B. If decreasing, what has been the decrease in Habitat area?

approximate change (%): 21% to 50% over how many years: 20

Notes on decrease:

7 6C. If stable or unknown, do you predict a decline in habitat?

approximate change (%): over how many years:

6D. State primary cause of change: Expanding settlements and overgrazing.

6E. Is there any change in the quality of the habitat where the taxon occurs? (Yes)

If yes, Describe: Decrease in quality

6F. State primary cause of change:

Notes: Human interference

7. Threats

	Rank	Present	Future	Lead to decline	Notes on future threats
1. Habitat Loss (Human Induced)					
1.1. Agriculture					
1.1.5 Grazing					
1.4. Unspecified causes					
1.4.1 Fragmentation					Extent at present unknown
2. Direct Loss/Exploitation					
2.1. Exploitation					
2.1.1. Hunting					
2.2 Trade					
2.2 Trade					Between Saudi Arabia, Yemen and UAE
3. Indirect Effects					
3.1 Human interference					
3.1 Human interference					Poisoning/frankincense collectors
3.1. Human interference					
3.1.5 Interspecific competition livestock					
3.3. Ecological imbalance					
3.3.5 Habitat loss					
3.3.5. Habitat loss due to exotic plants					
4. Natural disasters					
4.2 Drought					
4.2 Drought					
4.3 Fire					
4.3 Wildfire					
7. Intrinsic					
7.4 Genetic					
7.4 Inbreeding					

Panthera pardus nimr **Arabian leopard**

8. Trade:

8A. Is the taxon in trade? (Yes) Type of trade:: Local Commercial

8B. Parts in Trade: Bones, Live animal, Products, Skin — Domestic International

8C. Which form of trade (specified form) is resulting in a perceived or inferred population decline?
Young female from Yemen was sold to Saudi Arabia in April 2001. June/July 2001, 4 wild caught leopards were sold from Yemen, 2 went to Saudi Arabia, 2?
Parts in trade "products" refers to "Fat" from 2001 report.

9-10. Population numbers and

9A. Avg. age of parents in pop: Years

	Total Pop.	Mature
9B. Global Population:	< 250	< 250

10A. Recent past trends: Declining — Specify: declining, stable, or increasing

Rate of decline (past) 50% or more — For what period (years) 30

10B. Will population decline?

. Predicted Rate (future) — For what period (years)

11. Population Data quality

11A. Estimates base on: Census or monitoring, Indirect information, Field study, Museum records, Informal sightings, Literature, Hearsay/belief

Notes: Category "Census" applies only to Southern Oman

11B. Qualifiers: *Observed, Inferred, Suspected, Estimated, or Projected*

11C. Uncertainty: *95% confidence, Minimum/Maximum values, Range of Opinion; Evidentiary; Precautionary; Subjective; Hypothetical; Point estimate; or Range estimate*

12. Recent Field Studies

Researcher names, Location, Dates, Topics:
Scat analyses in Oman (p 218, Briefing Book 2002; work underway by a student from Aberdeen);
Unpublished fieldwork by Andrew Spalton in Oman
Limited fieldwork by Stuarts and Budd in United Arab Emirates and Kingdom of Saudi Arabia
Nader and Paillat - Saudi Arabia - 1999
Llewllyn-Smith, R. - United Arab Emirates - Current - Scats and footprints
Field studies in the briefing book and sources list at the end of this document
Camera trapping by the BCEAW, Sharjah

Part Two

13. Status

	(previous):	
13A. IUCN Red List categ;- Global:	Critically endangered	National:
13I. IUCN Red List Categ (Current)	Critically endangered	13J. Criteria basis: C1; C2a

13B. Cites: Cites category1 — 13C. Natl wildlife Legislation: See notes

13D. Natl Red Data Book: Oman, CR based on B1 and B2 — 13E. Intl Red Data Book: CR 2A (2000)

13F. Other legislation:

13G. Protected area presence: Jebel Samhan, Oman and Shada Al aa'la in KSA

Panthera pardus nimr **Arabian leopard**

13H. Endorsed protection plan: Agreement on conservation of wildlife and its habitats in GCC countries

Notes: New law: Oman 114/2001
New law: KSA: Hunting System, Wildlife Trade System
New law: Kuwait: Hunting and Trade

Part Three

14. Supporting Research Is research recommended for taxon? (Yes)

Specify:	Genetic research	Taxonomic research	Life history
Survey studies	Limiting factor research	Epidemiology	Trade

14A. Is Population and Habitat Viability Assessment recommended? (Yes)

Notes: The group is concerned about the fact that the propagation of captive breeding could be leading to an increasing removal of animals from the wild, for private collection

15. Management recommendations for the taxon *Specify:*

Habitat management	Wild pop management	Monitoring	Translocation
Sustainable utilization	Public education	Genome Resource Banking	
Limiting factor mgt.	Captive breeding	Work in local communities	

Notes: Address Policymakers

16. Captive management recommendations *If captive breeding recommended in Q15, is it for:*

Species recovery	Education	Reintroduction	Benign introduction
Research	Husbandry	Sustainable use	Preservation of live genome

Notes/other:

17. Do Captive stocks already exist? (Yes)

17A. Names of facilities: BCEAW
Taif
Saudi Arabia - private
Yemen - Taiz, Sana'a and private
Oman

17B. No. in captivity:

Males	Females:	Unsexed:	Total	Not known
15	19	1	35	

17C. Does a coordinated species management program exist for this species? (Yes)

If yes, specify Local studbook included in International Studbook

17D. Is a coordinated Species Management Program recomended for range country(ies)? (Yes)

If yes, specify Yemen, Oman, Saudi Arabia, United Arab Emirates

18. Level of captive breeding/cultivation recommended

Ongoing ex situ program intensified or increased

19. Are techniques extablished to propagate the taxon?

Techniques known for this taxon or similar taxon

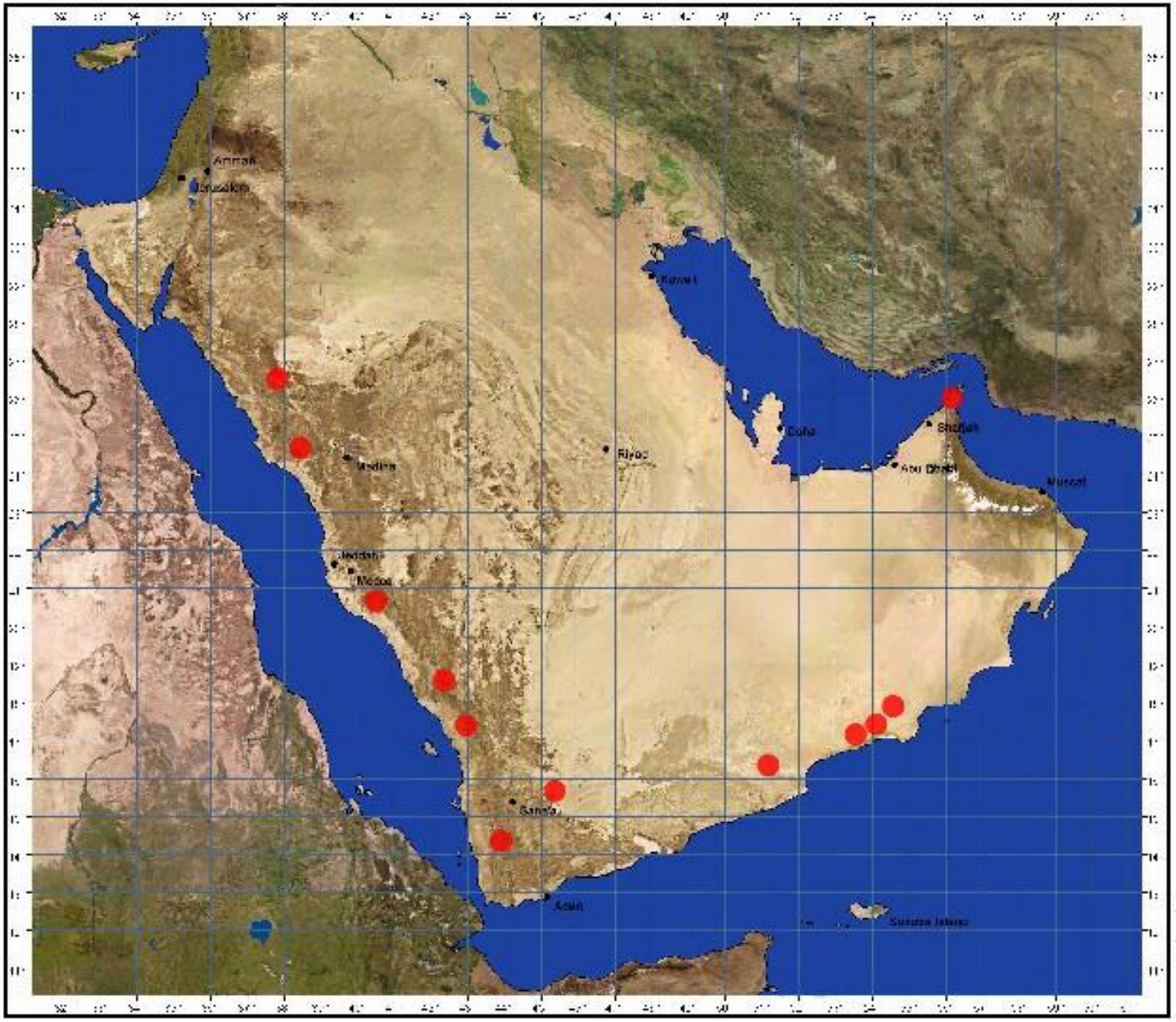
20. Other Comments

Part Four

21. Sources: Nahil Abdul Atif Abadi (1993): Wild Mammals of Yemen, Part 1
Nowell, K and Jackson, P. (1996): Wild Cats Status, Survey and Conservation Action Plan,

IUCN, Switzerland
Harrison, D.L. and Bates, P.J.J. (1991): The Mammals of Arabia, 2nd Edition. Harrison Zoological Museum, Sevenoaks, U.K.
Nader and Paillat (1999)
Walter, O. and Stubbington, T. (2000): Studbook listing for the Arabian Leopard 31.01.2000.
Breeding Centre for Endangered Arabian Wildlife, Sharjah, UAE
Fisher, M. et.al. (Eds) (1999): The Natural History of Oman. Festschriftfur Midael Gallaghes.
Backhuyse Publisher, Leiden. Pages 147 - 160
Studbook 2001
Biquand, S. and Boug, A. 1993. Report of Arabian Leopards in Al Faqrah, Hijaz Mtn.
Spalton and Willis - Oman - 1999

22. Compilers: Patrick Paillat, Stephane Ostrowski, Mohammed Ali Al Hammadi, Urs Breitenmoser, Andrew Spalton, Sean McKeown, Ahmed Boug, Abdulrahman Khoja, Christine Breitenmoser



Panthera pardus nimr

0 100 200 300 400 500 Kilometers

Arabian Caracal

Caracal caracal schmitzi

Conservation Assessment and Management Plan Workshop 2002

Section 3

Conservation Assessment Management Plan
Taxon Data Sheet

1.Scientific *Caracal caracal schmitzi* Matschie 1912

1A. Synonyms: Scientific synonym / ambiguities — Authority (date)
Felis caracal Schreber 1776

1B. Scientific nomenclature:
FAMILY: Felidae
ORDER:
CLASS: Mammalia

1C. CommonNames:

al kahanaq	Arabic
al washaq	Arabic
anaq al ardh	Arabic
caracal	English
caracal lynx	English
desert lynx	English
hirr	Arabic
khuwainga	Arabic
red lynx	English
tiffa	Arabic

1D.Taxonomic level: Subspecies
Notes:

2. Distribution of the Taxon

Primary(yes) **Country(ies)**

2A.Life form (plant):
2B. Habitat:
2C. Niche: Generalist present from sea level to 3000 meters. Everywhere except sand desert and major human settlements.
2D. Historical distrib: Throughout Arabian Peninsula except Qatar and Bahrain
2E. Current countries: Yemen, Oman, Saudi Arabia, United Arab Emirates
2F. Geograph. extent:
2G Migration regions:

Kuwait
Oman
Saudi Arabia
United Arab Emirates
Yemen

3. Approximate Area of Occurrence of the taxon in and around the area of study/ sighting/ collection
(Extent of occurrence is defined as the area contained within the shortest continuous imaginary boundary encompassing all known, inferred or projected sites of present occurrence of the taxon)

Occurrence area: > 20,000 sq km
Notes (Occurrence) 1.5 million square kilometers

4. Approximate Area of Occupancy of the taxon in and around the area of study/ collection
(Area of occupancy is defined as the area occupied by the taxon within the 'extent of occurrence')

Area of Occupancy: > 2,001 sq km
Notes (Occupancy): estimated to 0.5 million square kilometers

5. No. of Locations or Subpopulations in which the taxon is distributed: 0
Is there a continuous declined in subpopulations / locations?

Caracal caracal schmitzi **caracl lynx**

Are there extreme fluctuations in subpopulations/ locations?

Percentage of population that lives in most important subarea:

6. Habitat status: Not known

6A. Is there any change in the habitat where the taxon occurs? (Yes)

If yes, describe: Unknown

6B. If decreasing, what has been the decrease in Habitat area?

approximate change (%): over how many years:

Notes on decrease:

6C. If stable or unknown, do you predict a decline in habitat?

approximate change (%): over how many years:

6D. State primary cause of change:

6E. Is there any change in the quality of the habitat where the taxon occurs? (Yes)

If yes, Describe: Decrease in quality

6F. State primary cause of change:

Notes: Human interference and killing, overgrazing and a decrease in prey base

7. Threats

	Rank	Present	Future	Lead to decline	Notes on future threats
3. Indirect Effects					
3.3. Ecological imbalance					
3.3.6 Loss of prey base					Excluding Yemen
4. Natural disasters					
4.2 Drought					
4.2 Drought					
4.3 Fire					
4.3 Wildfire					

8. Trade:

8A. Is the taxon in trade? (Yes) Type of trade:: Local Commercial

8B. Parts in Trade: Live animal Domestic International

8C. Which form of trade (specified form) is resulting in a perceived or inferred population decline?

None

9-10. Population numbers and

9A. Avg. age of parents in pop: 4 Years

	Total Pop.	Mature	
9B. Global Population:	Less than 5000 based on Weisbein and Mendelssohn	unknown	Specify: declining, stable, or increasing
10A. Recent past trends:	Unknown	Unknown	
Rate of decline (past)	Don't know		For what period (years)
10B. Will population decline?			
. Predicted Rate (future)	10% or more		For what period (years) 10

Caracal caracal schmitzi **caracl lynx**

11. Population Data quality

11A. Estimates base on: Census or monitoring, Field study, Informal sightings, Indirect information, Museum records, Literature

Notes: Hearsay/belief

11B. Qualifiers: *Observed, Inferred, Suspected, Estimated, or Projected*

11C. Uncertainty *95% confidence, Minimum/Maximum values, Range of Opinion; Evidentiary; Precautionary; Subjective; Hypothetical; Point estimate; or Range estimate*

12. Recent Field Studies

Researcher names, Location, Dates, Topics:

van Heezik and Seddon- Northern Saudi Arabia- 1998- Caracal range size and habitat use (see sources)

Part Two

13. Status

(previous):

13A. IUCN Red List categ;- Global: Vulnerable National:

13I. IUCN Red List Categ (Current) 13J. Criteria basis:

13B. Cites: 1

13C. Natl wildlife Legislation: Oman- Ministerial decision 207/93, Royal Decree 111/96

13D. Natl Red Data Book: Oman Cr/C 2a, UAE vulnerable (from unofficial list

13E. Intl Red Data Book: Least Concern

13F. Other legislation:

13G. Protected area presence: Harrat al Harrah, Raydah, Yaloomi Oryx Reserve, Shada Al Ala Mountains, Otamah, Bora Mountain, Houff area

13H. Endorsed protection plan:

Notes: Category based on population estimates less than 1000 in Oman

Part Three

14. Supporting Research

Is research recommended for taxon? (Yes)

Specify:

Genetic research, Taxonomic research, Life history, Survey studies, Limiting factor research, Epidemiology, Trade

14A. Is Population and Habitat Viability Assessment recommended? (Yes)

Notes: No PHVA is recommended

15. Management recommendations for the taxon

Specify:

Habitat management, Wild pop management, Monitoring, Translocation, Sustainable utilization, Public education, Genome Resource Banking, Limiting factor mgt., Captive breeding, Work in local communities

Notes:
1- Monitoring- capture/release
2- Public Education- hunting/baiting/killing/environmental education
3- Habitat management
4- Work in local communities

16. Captive management recommendations

If captive breeding recommended in Q15, is it for:

Caracal caracal schmitzi **caracl lynx**

Species recovery	Education	Reintroduction	Benign introduction
Research	Husbandry	Sustainable use	Preservation of live genome

Notes/other:

17. Do Captive stocks already exist? (Yes)

17A. Names of facilities: See studbook. Also undisclosed number in private collections in United Arab Emirates, Saudi Arabia and elsewhere.

17B. No. in captivity:

Males	Females:	Unsexed:	Total	Not known
13	12	2	27	

17C. Does a coordinated species management program exist for this species? (Yes)

If yes, specify International studbook started in 2000

17D. Is a coordinated Species Management Program recommended for range country(ies)? (Yes)

If yes, specify Possible in future if population grows and Asian subspecies issue resolved

18. Level of captive breeding/cultivation recommended

No ex situ program recommended

19. Are techniques established to propagate the taxon?

Techniques known for this taxon or similar taxon

20. Other Comments

Part Four

21. Sources:

Harrison, D.L. and Bates, P.J.J. (1991): The Mammals of Arabia, 2nd Edition, Harrison Zoological Museum, Sevenoaks, U.K.

Van Heezik, Y. and Seddon, P. (1998): Range use and habitat use of an adult male caracal in Northern Arabia. Journal of Arid Environments (40): 109-112

Weisbein, Y. and Mendelssohn, H. (1990):The biology and ecology of the caracal in the Northern Ararah Valley of Israel. Cat News (12): 20-22

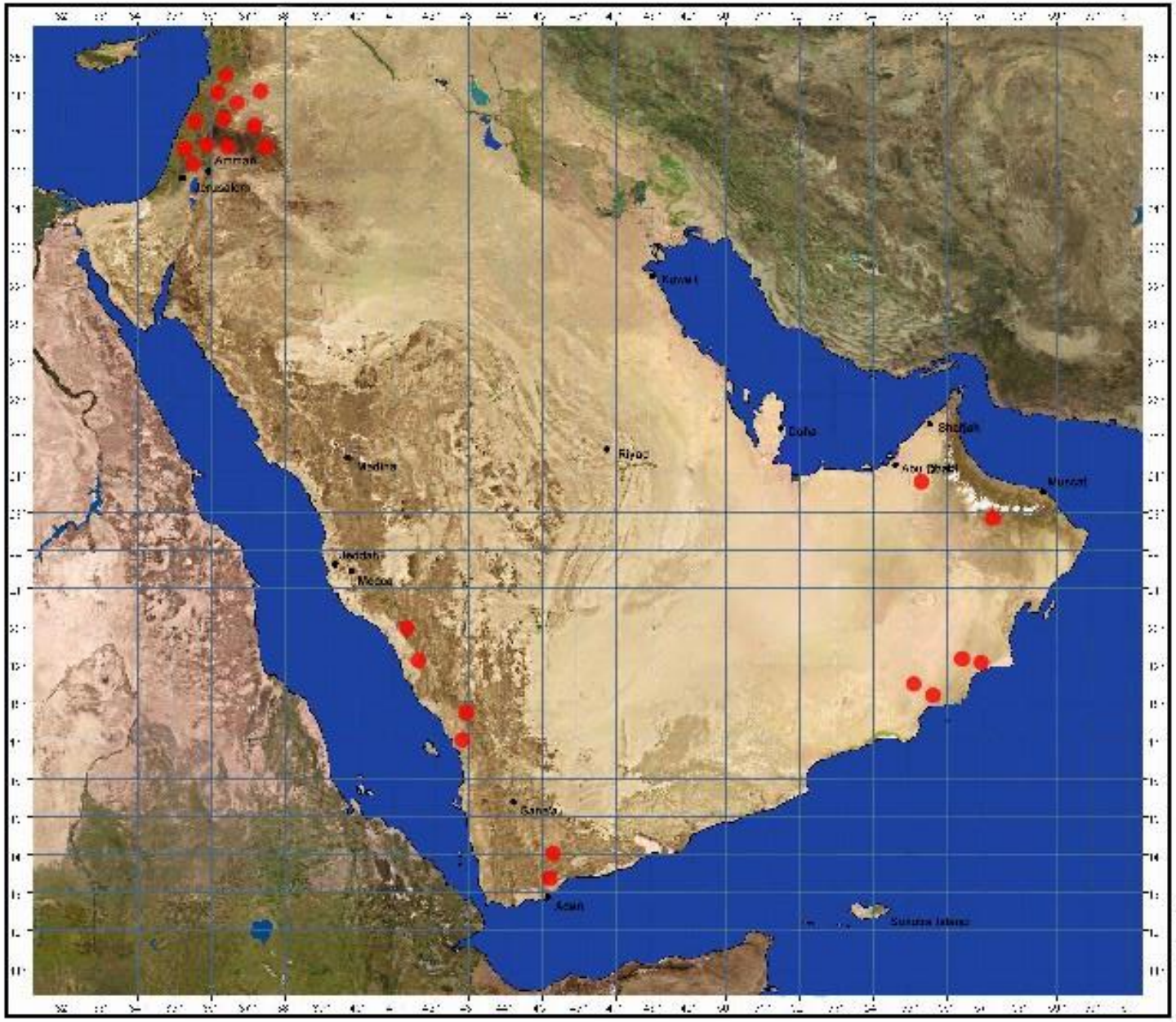
Nahil Abdul Atif Abadi (1993): Wild Mammals of Yemen, Part 1.

Nowell, K. and Jackson, P. (1996): Wild cats status, survey and conservation action plan, IUCN, Switzerland.

Versteeg, D. (1998): International Studbook for the Caracal, 31.12.1997, The Living Desert, U.S.A.

Hellyer, P. (1993): A summary of recent lynx and leopard sightings in the Northern UAE and Musandam. Tribulus (3): 11-13

22. Compilers: Patrick Paillat, Stephane Ostrowski, Mohamed Ali Al Hammodi, Urs Breitenmoser, Andrew Spalton, Sean McKeown, Ahmed Boug, Abdul Rahman Khoja, Christine Breitenmoser, Ouhoud Al Ragam, Abdullah al Haddad, Abdullrhman Hassan Hashim Al Shahary, Ali Salem Bait Said, Adel Mohd Al Awadi, Kai Perret



Caracal caracal schmitzi

0 100 200 300 400 500 Kilometers

Mountain gazelle

Gazella gazella

Conservation Assessment and Management Plan 2002

Section 4

Gazelle Group Report

Facilitator: Dr. Hany Tatwany
Scribe: Dr. David Mallon

Group members:

Hany Tatwany
Catrin Hammer
Ibrahim Khaleel Ibrahim
Amer Abdulwahab
Mohammed Mu'az Al Murad
Nayif Alomiyeen
Mohammed Jassim Al Jabbar
Declan O'Donovan
Mubarak Al Dosary
Mohammad Fawaz Al Baroudi
Mohammed Al Hindi
Ali bin Nasser bin Mohamed Al Rasbi
Dhayf Allah Al Shalan
David Mallon

A Taxon Data Sheet for the species as a whole was completed from the beginning to introduce the new members of the group to this process. There were no major changes but a few amendments were made.

In the light of new information: based on best estimates the population is 20-25,000 overall, but the situation is not uniform across the range: numbers in some countries are increasing, in others decreasing and others are stable.

A major issue remained the confusion between many named subspecies, other forms and colour variants within the species. Genetic research at KKRWC has made some progress towards identifying distinctive types and it was agreed there was no point in looking again in detail at the four subspecies that were considered in 2001 until relationships between various named forms within the species as a whole had been clarified. The ongoing research at KKWRC is expected to provide a final answer to this problem and will enable key conservation units in the Arabian Peninsula to be identified and priorities assigned.

Threats: There was a wide range of views on the most significant threats facing the species and reaching a consensus on several aspects was complicated by the fact that the situation varied widely across the region. For example, decline in habitat quality was seen as less of a problem in Yemen than elsewhere. Invasion of rangelands by exotic plants affected parts of Saudi Arabia. Hybridization and escape/release of animals of unknown origin were factors in UAE.

The problems identified included:

- Habitat Loss (agricultural/pastoral practices, soil erosion, overgrazing, mineral exploration/exploitation, uncontrolled tourism, military activity, drought).
- Direct Loss (hunting, trade, private collections/mismanagement, disease, urbanization/settlements, pollution).
- Lack of Knowledge (lack of awareness, lack of interest, identification techniques, lack of education).
- Lack of Resources (human and financial). Legal (inadequate legal framework, no regional strategy, lack of co-operation).
- Taxonomy (genetic/taxonomic confusion).

Following two paired ranking exercises; the threats were listed in the following order:

1. Genetics.
2. Legal.
3. Direct loss.
4. Knowledge.
5. Resources.
6. Habitat Loss.

Progress since the 2001 CAMP was reviewed. The taxonomic work at KKWRC had not been completed, as had been hoped, but results of genetic analysis of animals in two local collections had been received. The email group (gazelle-net) had not operated and would be relaunched after this CAMP with an expanded number of members. Further field surveys and monitoring in Saudi Arabia had been carried out. The IUCN Antelope Action Plan Part 4 was published in July 2001 and contained summaries of gazelle status in all countries of the region.

Problem statements

1) Confusion still exists between many named subspecies, other forms and colour variants within the species. This problem needs to be resolved so that conservation units in the Arabian Peninsula can be identified and priorities decided. Poorly-managed collections that keep animals from different origins together and allow interbreeding add to the existing confusion.

Goal: ***To establish an agreed taxonomy of the mountain gazelle in Arabia***.

Actions

- Encourage all countries with mountain gazelle populations (captive and wild) to provide genetic samples in accordance with the agreed protocol (attached) to KKWRC labs for analysis.
- In return KKWRC will provide results to all concerned institutions and individuals to help identify populations in need of immediate action.

1) There is often limited enforcement of the existing legal framework, a regional strategy for conservation of biodiversity in the Arabian Peninsula seems a long way away and co-operation between individual countries could be increased.

Goal: ***A common, workable, coordinated, ecosystem-based strategy for the conservation of the mountain gazelle.***

Actions

- Involve local people in the design and execution of the strategy.
- Encourage the active enforcement of existing legislation and strengthen or draft legislation where it is not in place.
- Establish or strengthen co-operation, and encourage the implementation of the recently adopted GCC wildlife agreement.

1) Despite legal protection, gazelles are shot or captured for private collections and household pets. Live animals and parts are traded and there is the potential for widespread captive mismanagement.

Goal: Stop the direct loss of mountain gazelle.

Actions

- Curtail illegal hunting and trade in mountain gazelles through legal and educational tools.
- Produce management guidelines for captive husbandry of mountain gazelles (Action: NCWP, Bahrain, and NCWCD, Saudi Arabia).
- Initiate a campaign to highlight and tackle the problem of domestic waste through legal, practical and educational tools.

1) There is a lack of awareness of biodiversity conservation within the region, and lack of interest in wild gazelles except as a source of captive animals. Information on identification techniques for monitoring purposes is also lacking.

2) In most of the Arabian Peninsula, habitat is continuing to be lost or degraded due to a variety of factors including agricultural/pastoral activities, soil erosion, road building, mineral exploration and exploitation together with other factors.

3) Lack of resources, human and financial, also affects the species.

General Protocol for Collection of Tissue for DNA Analysis

Contact: Dr. Mark Blacket, Genetics Laboratory,
King Khalid Wildlife Research Centre
c/o National Commission for Wildlife Conservation and Development
P.O. Box 61681,
Riyadh 11575,
Kingdom of Saudi Arabia,
Telephone: +966 1 4044412, Fax: +966 1 4011527
Email: kkwrc.ksa@zajil.net

DNA can usually be obtained from any animal tissue that contains cells. Some sources are obviously better than others, and the method of preservation can greatly influence the DNA yield. Below are presented four main sampling methods relating to: hair samples, blood samples, skin samples and tissue samples. Non-invasive methods are best, so some materials such as tissue samples can obviously only be obtained from animals that have died of natural causes.

Labelling
It is extremely important that samples are adequately labelled, this adds enormously to the potential information that they can provide. If envelopes are used, please write identification details on the envelopes; if tubes are used, please write the details on the tube. Please make a record of all available details about the sample, such as animal identification, the geographic origin of the animal, and any other relevant information regarding the sample (such as origin of the source animals of a captive group, or relationships between samples animals, if these details are known). An accompanying photograph can also be extremely useful (to relate the genetic data to coat colour, horn shape, etc.).

Hairs
Hair samples, consisting of approximately thirty hairs, should be *plucked* (not shaved or cut) from the animal. Plucking hairs from the flank of an animal as it is being handled is probably the easiest way to obtain samples. The hairs can be placed in a small envelope, sealed and stored at room temperature*.

Blood
If a vet is handling the animals, it may be possible to collect blood from the jugular vein (5mls is more than sufficient). This can be transferred into a tube containing either EDTA or 70- 100% ethanol and stored at room temperature*. If chromosome work is required the blood should not be stored in EDTA, but instead be placed in a tube containing Heparin and then be sent “on ice” to KKWRC.

Skin
It is often possible to collect a small section of skin from an animal’s ear when an identification tag is being attached. For deceased animals, portions of skin from the ear or other regions of the body are extremely useful sources of DNA. Skin samples can be stored dry in an envelope, placed in 70-100% ethanol or DMSO buffer** at room temperature, or can be frozen immediately.

Tissue

If an autopsy is being conducted, tissue samples (e.g. muscle, liver, etc.) can sometimes be obtained. These can be stored in 70-100% ethanolor DMSO buffer** at room temperature, or can be frozen immediately. A sampling of approximately 1 square centimeter of tissue is sufficient.

* For longer term storage (greater than a couple of days) samples should be kept in a refrigerator.

** On request KKWRC can supply tubes containing DMSO buffer, if you have material you wish to send here for DNA analysis.

Gazelle-net

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Conservation Assessment Management Plan
Taxon Data Sheet

1.Scientific *Gazella gazella* Palla 1776

1A. Synonyms: Scientific synonym / ambiguities Authority (date)

1B. Scientific nomenclature:

FAMILY: Bovidae
ORDER: Artiodactyla
CLASS: Mammalia

1C. CommonNames:

adaam	Arabic (Saudi Arabia)
dhabi	Arabic (Oman)
dumani	Arabic (UAE)
ghazal al jabal	Arabic (Bahrain, Saudi Arabia)
idmi	Arabic (Saudi Arabia)
mountain gazelle	English
saa'r	Arabic (Dhofar)

1D.Taxonomic level: Species

Notes:

2. Distribution of the Taxon **Country(ies)**
Primary(yes)

2A.Life form (plant):

2B. Habitat:

2C. Niche: Mountains, Foothills and plains of the Arabian Peninsula in a wide range of habitats.

Oman
Saudi Arabia
United Arab Emirates
Yemen

2D. Historical distrib: Saudi Arabia, Yemen, Oman, United Arab Emirates, Palestine, Jordan, Syria, Lebanon, (Iran - introduced)

2E. Current countries: Saudi Arabia, Yemen, Oman, United Arab Emirates, Palestine, Jordan, Lebanon, (Iran - introduced)

2F. Geograph. extent: Patchy distribution within the United Arab Emirates, Saudi Arabia, Yemen, Oman and localized in Jordan and Lebanon

2G Migration regions:

3. Approximate Area of Occurrence of the taxon in and around the area of study/ sighting/ collection
(Extent of occurrence is defined as the area contained within the shortest continuous imaginary boundary encompassing all known, inferred or projected sites of present occurrence of the taxon)

Occurrence area: > 20,000 sq km

Notes (Occurrence)

4. Approximate Area of Occupancy of the taxon in and around the area of study/ collection
(Area of occupancy is defined as the area occupied by the taxon within the 'extent of occurrence')

Area of Occupancy: > 2,001 sq km

Notes (Occupancy):

5. No. of Locations or Subpopulations in which the taxon is distributed: 50

Is there a continuous declined in subpopulations / locations?

Are there extreme fluctuations in subpopulations/ locations?

Gazella gazella **mountain gazelle**

Notes (subpops)

6. Habitat status: Fragmented

6A. Is there any change in the habitat where the taxon occurs? (Yes)
If yes, describe: Decrease in Area

6B. If decreasing, what has been the decrease in Habitat area?
approximate change (%): 21% to 50% over how many years: 50
Notes on decrease:

6C. If stable or unknown, do you predict a decline in habitat?
approximate change (%): over how many years:

6D. State primary cause of change:

6E. Is there any change in the quality of the habitat where the taxon occurs? (Yes)
If yes, Describe: Decrease in quality

6F. State primary cause of change:

Notes: Increase in human impact

7. Threats

	Rank	Present	Future	Lead to decline	Notes on future threats
1. Habitat Loss (Human Induced)					
1.1. Agriculture					
1.1.5 Grazing					
1.3. Development					
1.3.5 Roads					
1.4. Unspecified causes					
1.4.1 Fragmentation					
2. Direct Loss/Exploitation					
2.1 Exploitation					
2.1 Exploitation					Overexploitation
2.1. Exploitation					
2.1.1. Hunting					
2.2. Trade					
2.2.2. Illegal: Commodities					Trade for Market
2.3. Accidental mortality					
2.3.9 Road kills					
3. Indirect Effects					
3.1. Human interference					
3.1.5 Interspecific competition livestock					
3.2 Alien invasive species					
3.2 Alien invasive species					Exotic plants
3.2. Alien invasive species					
3.2.1 Competitors					
3.3. Ecological imbalance					
3.3.3 Hybridizers					
3.3.8 Nutritional disorders					
3.3.5 Habitat loss					

3.9 Other

3.9	Other	Desertification
3.9	Other	Discarded plastic bags are known to have resulted in impactions in some gazelle. General garbage and littering degrades the habitat.
3.9	Other	Soil changes

4. Natural disasters

4.2 Drought

4.2 Drought

8. Trade:

8A. Is the taxon in trade? (Yes) Type of trade:: Local Commercial

8B. Parts in Trade: Live animal, Meat, Skin, Taxidermy models — Domestic International

8C. Which form of trade (specified form) is resulting in a perceived or inferred population decline?

All forms of trade have an effect on the population

9-10. Population numbers and

9A. Avg. age of parents in pop: 0 Years

	Total Pop.	Mature	
9B. Global Population:	> 10,000	> 10,000	
10A. Recent past trends:	Stable	Stable	Specify: declining, stable, or increasing

Rate of decline (past) For what period (years)

10B. Will population decline?

. Predicted Rate (future) For what period (years)

11. Population Data quality

11A. Estimates base on: Census or monitoring, Field study, Informal sightings, Indirect information, Museum records, Literature, Hearsay/belief

Notes:

11B. Qualifiers: *Observed, Infeerred, Suspected, Estimated, or Projected*

11C. Uncertainty *95% confidence, Minimum/Maximum values, Range of Opinion; Evidentiary; Precautionary; Subjective; Hypothetical; Point estimate; or Range estimate*

12. Recent Field Studies

Researcher names, Location, Dates, Topics:

Mohammad Fawaz Al-Baroudi (NCWCD, Saudi Arabia) Reintroduction and follow-up work (behaviour, population, vegetation) in Uruq Bani Ma'arid Reserve.

Part Two

13. Status

	(previous):	
13A. IUCN Red List categ;- Global:	Lower risk - conservation dependent	National:
13I. IUCN Red List Categ (Current)	Near Threatened	13J. Criteria basis:
13B. Cites:	13C. Natl wildlife Legislation:	

Gazella gazella **mountain gazelle**

13D. Natl Red Data Book: 13E. Intl Red Data Book:

13F. Other legislation: Oman Royal Decree 114/2001

13G. Protected area presence: Saudi Arabia - Ibex Reserve, Mahazat As Sayd, Uruq Bani Ma'arid, Harrat Al Harrah, Al Kunfah, Farasan Islands; Oman - Turtle Nature Reserve, Wadi Sareen Tahr Reserve, Jebel Samhan NR, Arabian Oryx Sanctuary NR, As Saleel NP; UAE - Hatta; Jordan - Wadi Rum Reserve

Notes: National - Jordan - Insufficiently known; UAE - Insufficiently known; Yemen - Insufficiently known; Saudi Arabia - Vulnerable; Oman - National Biodiversity Strategy

Part Three

14. Supporting Research Is research recommended for taxon? (Yes)

Specify:	Genetic research	Taxonomic research	Life history
Survey studies	Limiting factor research	Epidemiology	Trade

14A. Is Population and Habitat Viability Assessment recommended? (Yes)

Notes:

15. Management recommendations for the taxon *Specify:*

Habitat management	Wild pop management	Monitoring	Translocation
Sustainable utilization	Public education	Genome Resource Banking	
Limiting factor mgt.	Captive breeding	Work in local communities	

Notes:

16. Captive management recommendations *If captive breeding recommended in Q15, is it for:*

Species recovery	Education	Reintroduction	Benign introduction
Research	Husbandry	Sustainable use	Preservation of live genome

Notes/other:

17. Do Captive stocks already exist? (Yes)

17A. Names of facilities: Many in Arabian Peninsula and internationally

17B. No. in captivity:

Males	Females:	Unsexed:	Total	Not known
0	0	0	2000	

17C. Does a coordinated species management program exist for this species? (Yes)

If yes, specify

17D. Is a coordinated Species Management Program recommended for range country(ies)? (Yes)

If yes, specify All range states - Saudi Arabia; Yemen; Oman; United Arab Emirates;

18. Level of captive breeding/cultivation recommended

Maintain

19. Are techniques established to propagate the taxon?

Gazella gazella **mountain gazelle**

Techniques known for this taxon or similar taxon

20. Other Comments Ongoing genetic research at KKWRC is expected to clarify relationships between many described forms.

Part Four

21. Sources:

Dunham, K.M. 1997a Population growth of mountain gazelles Gazella gazella reintroduced to central Arabia. Biological Conservation 81: 205 - 214

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Harrison, D.L. and Bates, P.J.J. 1991. The mammals of Arabia, 2nd Edition. Harrison Zoological Museum, Sevenoaks, England.

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Thouless, C.R., Grainger, J.G.; Shobrak, M. and Habibi, K. 1991. Conservation status of gazelles in Saudi Arabia. Biological Conservation 58: 85 - 98

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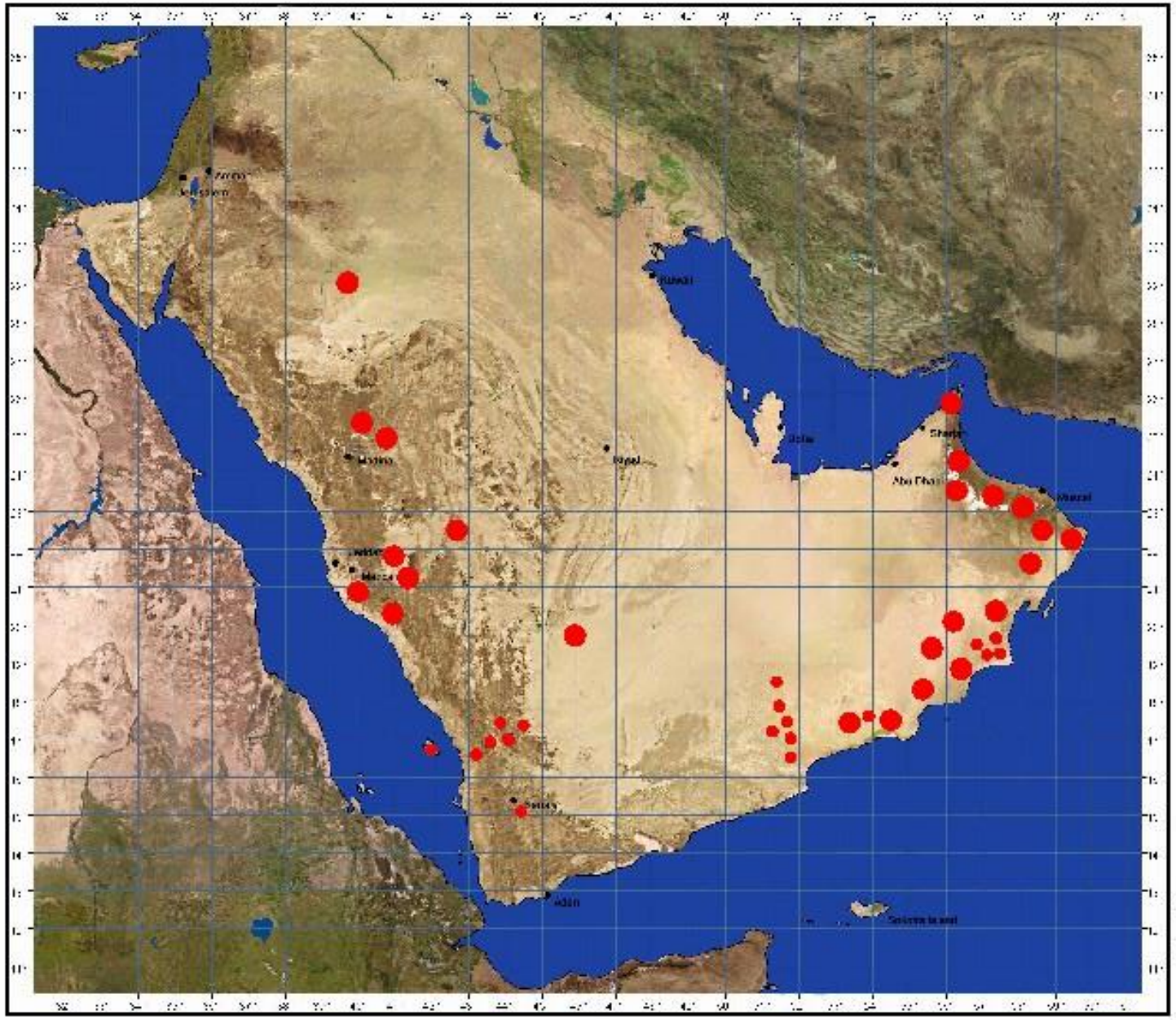
23. Reviews:



Gazella gazella

0 100 200 300 400 500 Kilometers

Nubian Ibex

Capra ibex nubiana

Conservation Assessment and Management Plan Workshop 2002

Section 5

Nubian Ibex Group Report

Facilitator: Mr. Richard Wood
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Nubian Ibex Group Executive Summary

Available information on the Nubian ibex (C*apra ibex nubiana*) was reviewed by representatives from the Sultanate of Oman, Yemen, Kingdom of Saudi Arabia, UAE and Jordan. Most of the population seems to be well protected and in no imminent danger, but data is lacking for certain populations.

Generally, there seems to be a lack of detailed knowledge of current trends in animal losses and habitat loss/degeneration, but inference and educated guesses were made by members; in whose country the ibex occurs. Threats identified included human disturbance; like oil exploration and military exercises, hunting, competition from domestic livestock, and drought. Their vulnerability also increases with migration of individuals to urban areas in search of water. In the Sultanate of Oman ibex numbers are fairly stable, but in KSA and particularly Yemen, threats were more evident, so overall a steady decline in population numbers was predicted.

The Sultanate of Oman proposed no particular action at this time, but Yemen agreed to promote a plan of public awareness to educate and make local people in ibex areas aware of wildlife conservation issues. KSA also agreed to intensify their already existing public awareness programme. Yemen will try and relieve human and livestock pressure on mountain water sources to try and prevent ibex migrating to urban areas in search of water, where they run the risk of being killed on the roads, contracting diseases from domestic livestock and hybridising with goats. The group also agreed to amass data on captive and wild populations of ibex at the next CAMP meeting, to promote a more coordinated conservation plan.

Problem/threats

The major problems facing the Nubian ibex can be divided into four main categories.

1. **Problem:** ***Human related activities lead to decline in Ibex populations***.

- Hunting. This seems to be most important in Yemen, where male-targeted hunting has escalated to indiscriminate hunting. The other populations (Jordan, KSA, Oman) are well protected and face no imminent threat of hunting.
- Development by petroleum companies. This is most important in Yemen, where exploration for oil resources leads to continued disturbance of ibex habitat.
- Military activity in Yemen leads to disturbance of ibex habitat.
- Poaching (live animals) a small-scale problem in Yemen.
- Competition with livestock is a small-scale problem with camels in KSA. In Yemen this is not a problem, since ibex and livestock do not occupy the same niche.

Goal: ***Create a framework for controlling declines in Ibex population numbers***

- Increased public awareness of the importance of ibex
- Reduce hunting/poaching activity
- Monitoring development plans to determine the effects of disturbance

Action: Yemen (Nagi, EPA) to go to NGO's and distribute documents, posters and information on ibex. Yemen (Nagi, EPA) also to invite international experts to visit habitat and initiate surveys and communication with locals. If not successful with international experts, Nagi will attempt this with local assistance.

2. **Problem:** ***Need for adequate data***

- There is a general lack of communication between institutions as far as captive populations are concerned.
- In Yemen there is a lack of data on the status and distribution of wild ibex populations. In the protected areas in Jordan and KSA there is regular monitoring of ibex populations.

Goal: ***Acquisition of data***

- Exchange of data
- Identify gaps in data

Action: All range countries to gather information on wild ibex populations for presentation at next CAMP meeting. Concern was expressed as to whether a zoo institution should coordinate the collection/collation of ibex population information.

NB Opinions are divided as to the nature of exchange of captive breeding information, and whether a coordinated captive breeding program should exist. There seems to be no framework from which to initiate such an exercise. Any further attempts at mixing bloodlines should be taken up by the involved institutions.

3. **Problem:** ***Need for increase in public awareness and wildlife education***

- Education and public awareness. KSA does have established education and social study programmes. More awareness is needed in Yemen, where local communities lack knowledge of the need to conserve ibex.

Goal: ***Increased public awareness and wildlife education***

- Identification of target groups
- Intensification of existing education programmes
- Local community participation

Action: Yemen to visit NGO's and distribute documents, posters and information on ibex (Nagi, EPA). KSA (KKWRC) to continue social study into use of ibex habitat.

4. **Problem:** ***Lack of natural water and grazing leads to migration of Ibex to urban areas; resulting in:***

- Hybridization. Report of goats mating with ibex in Yemen; offspring leave goat herds and return to the mountains, i.e. problems of genetic dilution; male ibex covering female goats according to available information. Also reports from KSA of goats mating (on a small scale) with ibex.
- Road kills. Small scale problem in Jordan, based on reports of four road kills.
- Reports of ibex (Jordan, Yemen) come near to urban areas, putting them at risk of being killed on roads, hunted or poached.
- Diseases widespread problem in Arabian Peninsula, including Foot and Mouth Disease (FMD) and Rinderpest (PPR). Proximity of goats with wild ibex increases chances of disease transfer.

Goal: ***Supplementation/control of water sources in Ibex habitat***

- Reduction in livestock pressure
- Find a mechanism to reduce human/livestock depletion of natural water sources

Action: KSA (KKWRC) to investigate methods to reduce livestock numbers in ibex habitat. Yemen (Nagi, EPA) to recommend to local authorities/leaders to institute system of supplementing water sources in ibex habitat during drought. KSA (KKWRC) and Yemen (Nagi, EPA) to exchange information regarding supplementation during drought.

Taxon Data Sheet: comments

2. Distribution of the taxon

2F. Distribution localities remain the same as previously reported, with the addition of Sarabed, a location near to the Doqum Mountains in the Sultanate of Oman. This does not increase the range of the Nubian ibex though.

6. Habitat status

6A-F. The consensus is that an overall decline in habitat area is occurring. Available data from general surveys suggests that this is the case in the Sultanate of Oman, while the activity of petroleum companies in Yemen seems to be having a negative effect on habitat quality (increased disturbance and hunting associated with military activity). Habitat is still fragmented, and there is concern that this may increase with continued development in the affected areas, i.e. more road and dam construction, and prospecting by petroleum companies, especially in Yemen.

7. Threats

Human interference:
Threats from human interference remain the same as identified before, with the addition of some new ones. In Yemen there is concern over military activity in areas where ibex occurs, due to associated hunting activity. There is also a report from Yemen of four ibex coming near to urban areas to drink water; two weak individuals were caught and kept by locals while the two others died. Road kills may also be a potential threat if individuals do come near to urban areas; in Jordan there are reports of four road kills in the last two years.

Natural/Man induced threats:
Diseases are always going to be a concern when ungulate populations come into contact with feral or domestic livestock, which is the case with the Nubian ibex. The fragmentation of ibex populations throughout their range introduces the possibility that genetic problems (e.g. inbreeding, low genetic diversity) can occur, but the consensus is that separate populations are big enough at this stage to alleviate this concern. Hybridization may well be a concern, based on reports from Yemen of interbreeding with feral/domestic goats. If this is the case, competition with feral goat populations may not be a factor, i.e. ibex and goat populations can co-exist. Predation by natural predators (leopard, wolf) is not considered to be a significant threat and there are no confirmed reports of feral dogs predating on ibex.

8. Trade

There are no confirmed reports of illegal trade in the ibex's range, but as with many other animals, trade of parts or whole animal may occur; there are reports of illegal trade in Jordan. It is suspected that ibex horns may be important in cultural activities, or eating of meat may provide strength to the hunter.

9. Population numbers

There is a general lack of data on population numbers, but estimates do exist for each of the range countries. These are as follows:

Country	Population estimate	Number of populations
Sultanate of Oman	1500	3
Yemen	±700	5
Kingdom of Saudi Arabia Bani Tamim At Tubay Asir Mountains Hijaz Mountains	200-250 150+ ±50 100+	4
Jordan	500	3
TOTALS	±3200	

10. Population trends

As with previous data, overall there seems to be a decrease in population numbers. By country this seems to be most prevalent in Yemen and KSA. Population numbers seem to be remaining stable in the Sultanate of Oman. Due to a lack of data, the rate of decline is unknown.

11. Data quality

Most data throughout the region is based on reports from rangers, or estimates from protected areas. Data from Yemen is based mainly on indirect information from locals and rough estimates.

13. Status

The IUCN status of Vulnerable was assigned based mainly on predicted declines in population numbers.

14. Supporting Research

As highlighted previously, the different populations need to be studied, and a better idea of population numbers and the real threats facing ibex needs to be obtained. Their situation is not as bad as the Arabian tahr for example, but efforts should be focused on preventing such a situation arising. Surveying and monotoring programmes should be intitiated to obtain concrete data on the populations.

16. Captive management

Interchange of animals between breeding centers should be intensified to prevent inbreeding and introduce new bloodlines.

17. Captive Stocks

The following figures are based on reports from representatives present at the meeting:

Country	Males	Females	Unknown	TOTALS
Jordan	5	25	10	40
BCEAW, UAE	9	5	-	14
Qatar	12	8	-	20
Al Ain Zoo, UAE	53	45	4	102
Ta'if, KSA	4	12	-	16
Bahrain	?	?	?	?
TOTALS	83	95	14	192

Conservation Assessment Management Plan
Taxon Data Sheet

1.Scientific *Capra ibex nubiana* Linneaus 1758

1A. Synonyms:	Scientific synonym / ambiguities	Authority (date)
	Aegoceros	
	Capra arabica	
	Capra mengesi	
	Capra nubiana	
	Capra sinaitica	

1B. Scientific nomenclature:

FAMILY:	Bovidae
ORDER:	Artiodactyla
CLASS:	Mammalia

1C. Common Names:		
	al' badn	Saudi Arabia
	al wa'al aljabi	Saudi Arabia
	al wa-al alnubi	Oman
	baoch	Salalah Region, Yemen
	Nubian ibex	English
	wa'al	Saudi Arabia

1D.Taxonomic level: Subspecies

Notes:

2. Distribution of the Taxon **Country(ies)**

Primary(yes)

2A.Life form (plant):

Oman
Saudi Arabia
Yemen

2B. Habitat:

2C. Niche: Steep mountain terrain (escarpment), (Huqf - Arabic for escarpment). From escarpment plains up to mountain tops. Maximum elevation depending on locations in Arabian Peninsula

2D. Historical distrib: On Arabian Peninsula - Oman, Yemen, Saudi Arabia, possibly UAE

2E. Current countries: Oman, Yemen, Saudi Arabia

2F. Geograph. extent: Oman: Arabian Oryx Sanctuary, Al Huqf Ecsparment - 3 areas between Al Huqf and Dhofar Mountains, south Al-Jazr, Shuwaimia, Doqm Mountains; Dhofar Mountains, Ra'as Madnakah, Sarabed (near Doqm Mountains)

2G Migration regions:

3. Approximate Area of Occurrence of the taxon in and around the area of study/ sighting/ collection

(Extent of occurrence is defined as the area contained within the shortest continuous imaginary boundary encompassing all known, inferred or projected sites of present occurrence of the taxon)

Occurrence area: > 20,000 sq km

Notes (Occurrence)

4. Approximate Area of Occupancy of the taxon in and around the area of study/ collection

(Area of occupancy is defined as the area occupied by the taxon within the 'extent of occurrence')

Area of Occupancy: > 2,001 sq km

Notes (Occupancy):

Capra ibex nubiana **Nubian ibex**

5. No. of Locations or Subpopulations in which the taxon is distributed: 0

Is there a continuous declined in subpopulations / locations?

Are there extreme fluctuations in subpopulations/ locations?

Percentage of population that lives in most important subarea:

Notes (subpops)

6. Habitat status:

6A. Is there any change in the habitat where the taxon occurs? (Yes)

If yes, describe: Decrease in Area

6B. If decreasing, what has been the decrease in Habitat area?

approximate change (%): 21% to 50% over how many years:

Notes on decrease:

6C. If stable or unknown, do you predict a decline in habitat?

approximate change (%): over how many years:

6D. State primary cause of change: Sultanate of Oman: general surveys indicate a decline in area

6E. Is there any change in the quality of the habitat where the taxon occurs? (Yes)

If yes, Describe: Decrease in quality

6F. State primary cause of change:

Notes: Habitat is naturally fragmented, however there is concern that road and dam construction as well as oil exploration will increase fragmentation.

7. Threats

	Rank	Present	Future	Lead to decline	Notes on future threats
1. Habitat Loss (Human Induced)					
1.1. Agriculture					
1.1.5 Grazing					Disturbance by frankincense traders
2. Direct Loss/Exploitation					
2.1. Exploitation					
2.1.1. Hunting					
2.3. Accidental mortality					
2.3.9 Road kills					Reports of 4 road kills in jordan in last two years. Increased roads
2.3.1 Artificial Lighting					
3. Indirect Effects					
3.1. Human interference					
3.1.5 Interspecific competition livestock					
3.2. Alien invasive species					
3.2.1 Competitors					
3.3. Ecological imbalance					
3.3.4 Pathogens/parasites					
3.3.5 Habitat loss					
3.3.8 Nutritional disorders					
3.3.2 Predators					
3.3.3 Hybridizers					
3.9 Other					
3.9 Other					Aircraft

Capra ibex nubiana **Nubian ibex**

3.9 Other — Disturbance due to military activity

4. Natural disasters

4.2 Drought

4.2 Drought

5. Pollution

5.4 El nino

5.4 El nino

7. Intrinsic

7.4 Genetic

7.4 Inbreeding

8. Trade:

8A. Is the taxon in trade? (Yes) Type of trade:: Local Commercial

8B. Parts in Trade: Horn, Live animal, Taxidermy models — Domestic International

8C. Which form of trade (specified form) is resulting in a perceived or inferred population decline?

9-10. Population numbers and

9A. Avg. age of parents in pop: 0 Years

	Total Pop.	Mature
9B. Global Population:	< 10,000	< 2,500
10A. Recent past trends:	Stable	Stable

Specify: declining, stable, or increasing

Rate of decline (past) — For what period (years)

10B. Will population decline?

. Predicted Rate (future) 20% or more — For what period (years)

11. Population Data quality

11A. Estimates base on: Census or monitoring, Field study, Informal sightings, Indirect information, Museum records, Literature, Hearsay/belief

Notes:

11B. Qualifiers: *Observed, Inferred, Suspected, Estimated, or Projected*

11C. Uncertainty: *95% confidence, Minimum/Maximum values, Range of Opinion; Evidentiary; Precautionary; Subjective; Hypothetical; Point estimate; or Range estimate*

12. Recent Field Studies

Researcher names, Location, Dates, Topics:

Tear and Spalton in Al-Huqf, Oman 1991 - 1997 and 1994 - 1996 (VHF telemetry)

Part Two

13. Status

	(previous):		
13A. IUCN Red List categ;- Global:	Data deficient	National:	
13I. IUCN Red List Categ (Current)	Vulnerable	13J. Criteria basis:	C1 (February 2001)

13B. Cites: Unlisted

13C. Natl wildlife Legislation: Saudi Arabia, Oman, Jordan protected

Capra ibex nubiana **Nubian ibex**

13D. Natl Red Data Book: Oman - EN C2a 13E. Intl Red Data Book: EN C2a 1996

13F. Other legislation: RD 114, 2001 Oman

13G. Protected area presence: The Huqf Escarpment, Jebel Samhan Nature Reserve in Oman. Also 3 areas in Oman between Huqf and Dhofar mountains: Doqm mountains, south Al-Jazer, Suwaimia, Arabian Oryx Reserve, Dhofar mountains (Jabal Qamar). Yemen - Saudi Arabia: Reserve 200km south of Riyadh - Ibex Reserve; Al Tobiq Reserve. North of Saudi Arabia: Al-Hejaz mountains' Asier Mountains

13H. Endorsed protection plan: Action plan in Saudi Arabia, Yemen and Jordan

Notes: Predict greater than 10% population decline in next 10 years

Part Three

14. Supporting Research Is research recommended for taxon? (Yes)

Specify:	Genetic research	Taxonomic research	Life history
Survey studies	Limiting factor research	Epidemiology	Trade

14A. Is Population and Habitat Viability Assessment recommended? (Yes)

Notes: Although life cycle and habitat on Arabian Peninsula is well known; differences between areas ibex inhabit need further study

15. Management recommendations for the taxon *Specify:*

Habitat management	Wild pop management	Monitoring	Translocation
Sustainable utilization	Public education	Genome Resource Banking	
Limiting factor mgt.	Captive breeding	Work in local communities	

Notes:

16. Captive management recommendations *If captive breeding recommended in Q15, is it for:*

Species recovery	Education	Reintroduction	Benign introduction
Research	Husbandry	Sustainable use	Preservation of live genome

Notes/other:

17. Do Captive stocks already exist? (Yes)

17A. Names of facilities: Breeding Centre for Endangered Arabian Wildlife (9.5), Sharjah, UAE; Taif Breeding Centre (4.12), Kingdom of Saudi Arabai; Riyadh Zoo, KSA; Hawar Island, Bahrain; Al-Wabin (12.8), Qatar; Al Areen NCWP, Bahrain; Al Ajbah Natural Reserves (5.25), Jordan.

17B. No. in captivity:

Males	Females:	Unsexed:	Total	Not known
83	95	14	192	

17C. Does a coordinated species management program exist for this species? (Yes)

If yes, specify

17D. Is a coordinated Species Management Program recommended for range country(ies)? (Yes)

If yes, specify Where captive breeding is going on.

18. Level of captive breeding/cultivation recommended

Ongoing ex situ program intensified or increased

19. Are techniques established to propagate the taxon?

Some techniques known for taxon or similar taxon

Capra ibex nubiana **Nubian ibex**

20. Other Comments Captive stocks to be managed more intensively; monitoring reserve areas in KSA, Yemen, Jordan, Qatar; extend breeding program to Oman. Urgent need for more information on status in protected areas. Intensifying survey in unprotected areas (Yeman). Genetic exchange between captive populations needs to be intensified.

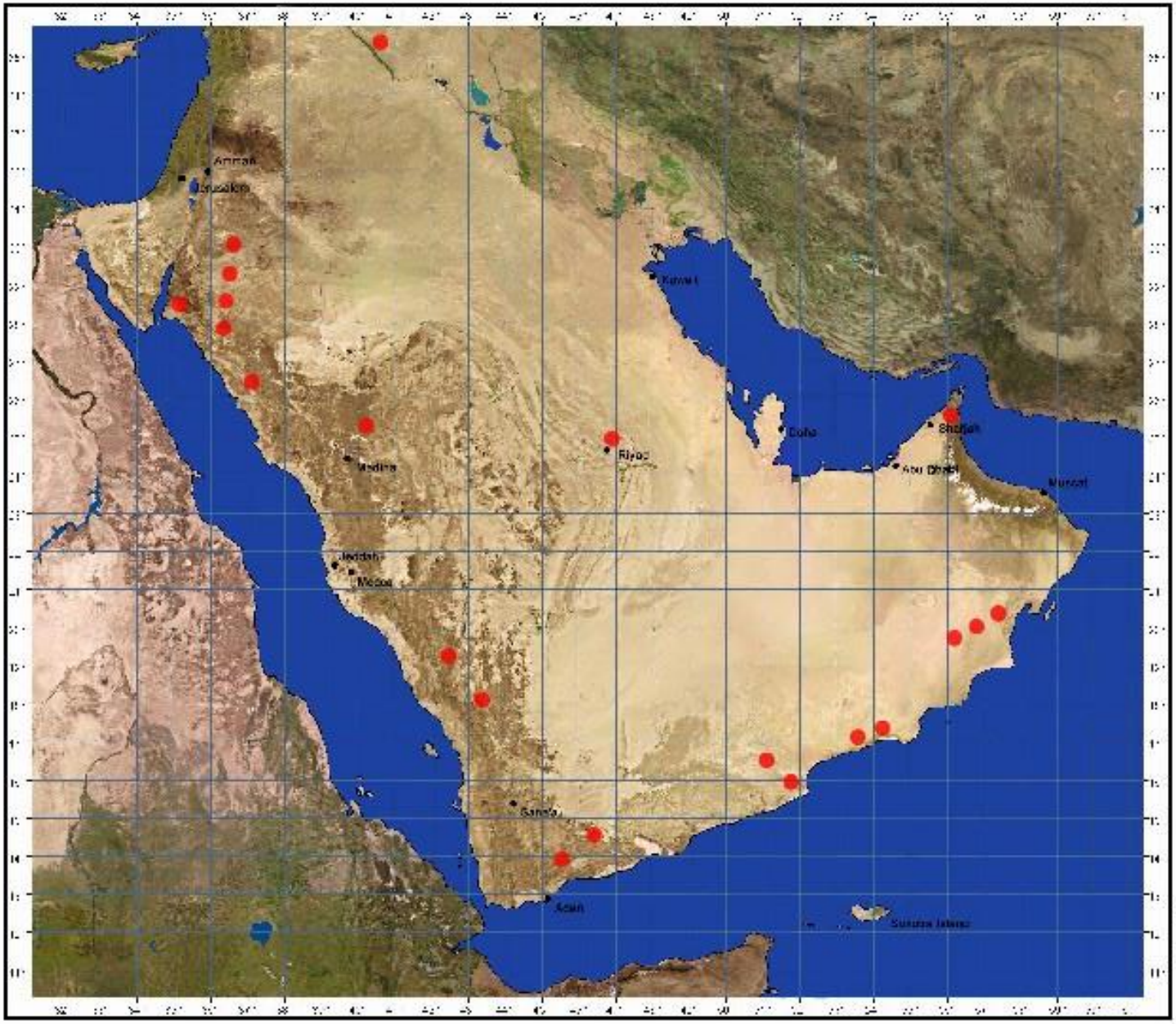
Part Four

21. Sources:

Martin Fisher, Natural History of Oman
Habibi, Khushal. 1994. The Desert Ibex. NCWCD, Riyadh and Immel Publishing, London. p 192
Harrison, D.L. and Bates, P.J.J. 1991. The Mammals of Arabia. Harrison Zoological Museum, Sevenoaks, UK. pp 180 - 183

22. Compilers: Lanral Ruddock, Abdulaziz Al Midfa, Mohammed Abul Hashem, Richard Wood, Difaullah Al Shalan, Dr. Qassem N. Al Qhatani, Nagi S. Thowabeh, Dr. Ayoub Al-Balushi, Tariq Al Makhaini, Dr. Azhar Abbas, Dr. Jacob Mwanzia, Katalin Szemerady, Nayif Al Omayreen

23. Reviews:



Capra ibex nubiana

0 100 200 300 400 500 Kilometers

Arabian Tahr

Hemitragus jayakari

Conservation Assessment and Management Plan Workshop 2002

Section 6

Arabian Tahr Group Report

Facilitator: Mr. Richard Wood
Scribe: Mr. Lanral Ruddock

Group Members:

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Arabian Tahr Group Executive Summary

Previous plans and actions on the Arabian tahr (*Hemitragus* jayakari) were reviewed by representatives from the Sultanate of Oman, Yemen, Kingdom of Saudi Arabia, United Arab Emirates and Jordan. Taxon data sheets were updated and the CAMP assessment procedures were followed to ascertain current priority issues affecting the future of tahr populations.

There was concern over the lack of progress since CAMP 2001 (due to factors beyond the control of the participants), and a realisation that limited evidence showed that tahr numbers were at least stable in most parts of the range, but had declined in some areas. However, more information is still needed on tahr numbers and habitat status, which will hopefully be achieved through collaborative surveys in unprotected areas. Furthermore, due to concerns of uncontrolled hunting and poaching in unprotected areas of tahr range, recommendations will be made to the relevant authorities for stronger law enforcement in these areas, as well as the proclamation of more Royal Decree protected areas.

The group also felt that there was not enough awareness of wildlife issues among the public in general, and not enough awareness of the urgency of wildlife issues among decision makers. It was proposed to continue the group's previously agreed public awareness poster, but independently by each country (Oman and the UAE). Furthermore, delegates representing the conservation institutions in each country will attempt to alert senior decision makers to the needs of wildlife and the Arabian tahr in particular, through a series of letters to these relevant authorities within their own and other's organizations.

The goals at this CAMP were kept as low key as possible, in order that they may be more quickly achievable, and hopefully provide a basis for more ambitious plans in the future to preserve the Arabian tahr in both the wild and captivity.

Problems, goals and action plans

Current and specific problems/threats facing the Arabian tahr were identified and grouped into four major problem definitions. Ultimate goals were set for these problems and only realistically achievable actions were considered. The main concerns were that, although much data is needed to facilitate the process of conserving tahr populations, it is becoming urgent to start/continue protecting unsurveyed populations.

1. **Problem:** *Increasing human/livestock utilization of tahr habitat leads to the deterioration of their habitat*

   - Development (roads/dams)
   - Overgrazing and competition from livestock
   - Hunting
   - Habitat fragmentation
   - Disturbance

   Goal: *Establish well-managed protected areas by:*

   - Habitat management
   - Education/awareness of local communities
   - Research of tahr habitat

   Action: Oman (Dr. Ayoub, Richard Wood (OMBC), Tariq Al Makhaini; Ministry of the Environment) to send a letter of recommendation with an executive summary of this CAMP to the Ministry of Municipalities and the Environment to recommend an increase in tahr areas supported by Royal Decree. UAE (AbdulAziz Al Midfa, EPAA) to continue process of applying for protected area for tahr.

2. **Problem:** *Lack of awareness and law enforcement at all levels leads to overexploitation of tahr*

   - Hunting
   - Lack of law enforcement
   - Lack of public awareness and education
   - Lack of respect for wildlife
   - Poaching of live animals

   Goal: *Establishing a strategy for wildlife education, public awareness and local involvement, using tahr as flagship species*

   - School and university education
   - Public awareness campaigns
   - Law enforcement education

   Action: UAE (AbdulAziz Al Midfa, EPAA; Lanral Ruddock, BCEAW;) will continue producing the tahr awareness poster and distribute it to relevant locations. Oman (Dr. Ayoub, Richard Wood (OMBC); Ministry of the Environment) to wait for the eventual approval of tahr awareness posters. These posters may not be an ideal solution but are a starting point towards increased public awareness. They will be distributed to schools, border posts, local villages and police stations.

3. **Problem:** *There is limited cooperation between institutions and countries*

- Insufficient cooperation between institutions and governments of range countries
- There is no coordinated captive management programme

Goal: *Establishing a formal code of cooperation at all levels between the Sultanate of Oman and the UAE*

- Pursuit of a cooperative agreement between institutions
- Promotion of understanding with decision-makers
- Identifying additional stakeholders

Action: UAE (AbdulAziz Al Midfa, EPAA) will write a letter/proposal to the Department of Environment and Wildlife Management, Abu Dhabi, for the exchange of tahr individuals between Sir Bani Yas Island reserve and BCEAW, Sharjah. Dr. Jacob Mwanzia, Abu Dhabi, will promote this proposal at the relevant higher level. Oman and the UAE will separately formulate an executive summary of recommendations from this CAMP, which will be utilized to inform senior decision makers of the need for wildlife legislation.

4. **Problem:** *Lack of recent and reliable data on tahr and tahr populations makes management and decision making difficult*

- Limited field data on status of tahr populations
- Limited research data

Goal: *Supplementation of current data on tahr*

- Establishing priority field surveys
- Captive breeding research
- Convincing decision-makers

Action: UAE (BCEAW) will collate all data/information on the Arabian tahr and identify major gaps in data. This can be used as a basis for further data collection. A proposal for intensified surveys of tahr in Oman (outside the protected areas) to be set up by BCEAW and Oman (institutions to be identified).

Taxon Data Sheet: comments

1. Scientific Name

1C. Additional arabic names from Muscat, Sultanate of Oman, include *Abu Shamia* (adult male tahr) and *Etood* ("baby" tahr). These names are used by local bedu in this region.

5. Populations and subpopulations

Records of tahr additional to those of 2001 include 4 more camera trap photographs (May – November 2001) and two sightings (June, October 2001) of female tahr in Wadi Wurayah, Northern Hajar Mountains, UAE. There are also reports of young tahr collected from locals near Hatta in the UAE. The Oman populations remain the same.

6. Habitat status

6A-F. Habitat status is declining in the UAE as predicted in CAMP 2001. Dam and road construction are the two major causes of decrease in habitat size (6D), with an associated increase in disturbance and therefore decline in habitat quality, in the UAE Mountains. There is anecdotal information that decrease in habitat status is occurring in some areas of Oman, whereas most areas are remaining stable.

7. Threats

Human interference:
Hunting continues to be a problematic threat to remaining individuals in the Northern Hajar Mountains of the UAE; several camera trap photographs of hunters and a recent finding (January 2002) of possible tahr skin in Wadi Wurayah confirms this.

Natural/Man induced threats:
Tahr may be subject to the same diseases and parasites as feral goats. One camera trap photograph of a female tahr in the Northern Hajar Mountains (UAE) suggests possible nutritional disorders. Competition with gazelle in parts of overlapping range may be a possibility.

8. Trade

8B. Trade in throat glands suggested before, but lack of further information on this makes the possibility speculative. Reports of young tahr collected from local bedu near Hatta, which are destined as gifts for important people, suggest that live animals are being traded.

9. Population numbers

9B. Possible third population in the UAE near Hatta (reports of captive animals), but these individuals may originate from Oman across the border.
9C. If the populations are split by country, recent surveys suggest that the UAE population in the Northern Hajar Mountains is less than 50. Overall, however, the population numbers are still estimated to be less than 2500.

10. Population trends

10A. Although population numbers seemed to have decreased significantly in the UAE, variable trends with the larger populations in Oman probably nullify this decline. Increase in populations numbers in Oman have been reported in Jabal Qhawan and Jabal Sabta, while decreases have been reported in Al Rabbah.

14. Supporting Research

With the addition of further expertise to the work group, epidemiology studies have also been suggested, especially since diseases and parasites can be transferred between livestock and tahr. Research into the level of education and knowledge of tahr of locals is also suggested.

17. Captive Stocks

17A. Young tahr given as gifts to important people in the Al Ain area (Al Rohwa) suggest that some private collections may exist in the UAE.
17B. The current number in captivity are as follows:

	Males	Females	TOTALS
BCEAW, Sharjah, UAE	1	0	1
Sir Bani Yas, Abu Dhabi, UAE	3	6	9
Omani Mammal Breeding Center	16	9	25
TOTALS	20	15	35

20. Other comments

The overall consensus is that the Arabian tahr populations in both Oman and the UAE are not facing a bright future. Although populations in the Sultanate of Oman seem to be doing well, future development and population fragmentation may affect the populations adversely. Oman has made the first step towards captive breeding cooperation across borders, which should pave the way for further national and international captive breeding cooperation. The high level of inbreeding in captive populations further necessitates the transferring of captive individuals between institutions.

Conservation Assessment Management Plan
Taxon Data Sheet

1.Scientific *Hemitragus jayakari* Thomas, 1894

1A. Synonyms: Scientific synonym / ambiguities Authority (date)

1B. Scientific nomenclature:

FAMILY: Bovidae
ORDER: Artiodactyla
CLASS: Mammalia

1C. Common Names:

abu shamea	Arabic
al thar al Arabi	Arabic
al wa'al al Arabi	Arabic
Arabian tahr	English
etood (young tahr)	Arabic

1D.Taxonomic level: Species

Notes:

2. Distribution of the Taxon **Country(ies)**

Primary(yes)

2A.Life form (plant):

Oman
United Arab Emirates

2B. Habitat:

2C. Niche: Arid mountains, Sea level to 3000 meters

2D. Historical distrib: Sultanate of Oman and United Arab Emirates

2E. Current countries: Sultanate of Oman and United Arab Emirates

2F. Geograph. extent: Sultanate of Oman and United Arab Emirates

2G Migration regions: Possible migration but no data

3. Approximate Area of Occurrence of the taxon in and around the area of study/ sighting/ collection

(Extent of occurrence is defined as the area contained within the shortest continuous imaginary boundary encompassing all known, inferred or projected sites of present occurrence of the taxon)

Occurrence area: 5,001 - 20,000 sq km

Notes (Occurrence) Insall (1999, p.132) gives 19, 000sq. Km of "primary" and "secondary" habitat

4. Approximate Area of Occupancy of the taxon in and around the area of study/ collection

(Area of occupancy is defined as the area occupied by the taxon within the 'extent of occurrence')

Area of Occupancy: > 2,001 sq km

Notes (Occupancy): Best data suggest area of occupancy of 13, 400 sq. km comprising 134 10x10 km squares (Insall, 1999. P. 136)

5. No. of Locations or Subpopulations in which the taxon is distributed: 5

Is there a continuous declined in subpopulations / locations?

Are there extreme fluctuations in subpopulations/ locations?

Percentage of population that lives in most important subarea: <90%

Notes (subpops) Extreme fluctuations in subpopulations and locations are localized to the UAE. Wadi Surin Nature Reserve contains 10 - 15% of the population. New information for 2002 - 2004 camera trap photographs (May - November 2001) and 2 sightings (June, October 2001) of female tahr in Wadi Wurayah, Northern Hajar Mountains, UAE. The oman population remains the same. In Northern Oman there are 3 main locations and 17

Hemitragus jayakari **Arabian tahr**

6. Habitat status: Fragmented areas where tahr are present. In the UAE Jebel Hafit (common to Oman) as well.

6A. Is there any change in the habitat where the taxon occurs? (Yes)
If yes, describe: Decrease in Area

6B. If decreasing, what has been the decrease in Habitat area?
approximate change (%): < 20% over how many years: 5
Notes on decrease:

6C. If stable or unknown, do you predict a decline in habitat?
approximate change (%): over how many years:

6D. State primary cause of change: The decrease overall is small, major decrease in the UAE. Habitat status is declining in the UAE as predicted in CAMP 2001. Dam and road construction are the two major causes of decrease in habitat size, with an associated increase in disturbance and therefore decline in habitat quality in the UAE mountains. Most areas in Oman are stable.

6E. Is there any change in the quality of the habitat where the taxon occurs? (Yes)
If yes, Describe: Decrease in quality

6F. State primary cause of change:

Notes: Change in habitat primarily due to increased disturbance.

7. Threats

	Rank	Present	Future	Lead to decline	Notes on future threats
1. Habitat Loss (Human Induced)					
1.1. Agriculture					
1.1.5 Grazing					
1.3. Development					
1.3.6 Dams					
1.4. Unspecified causes					
1.4.1 Fragmentation					
2. Direct Loss/Exploitation					
2.1 Exploitation					
2.1 Exploitation					Hunting continues to be problematic in the Northern Hajar Mountains in the UAE; several camera trap photographs of hunters and a recent finding (January, 2002) of possible tahr skin in Wadi Wurayah confirms this.
3. Indirect Effects					
3.1. Human interference					
3.1.5 Interspecific competition livestock					Goats
3.2. Alien invasive species					
3.2.4 Pathogens/parasites					Tahr may subject to the same diseases and parasites as feral goats.
3.3. Ecological imbalance					

Hemitragus jayakari **Arabian tahr**

3.3.5 Habitat loss

3.3.1 Competitors — Competition with gazelle in parts of overlapping range may be a possibility.

3.3.8 Nutritional disorders — One camera trap of a female tahr in the Northern Hajar Mountains (UAE) suggests possible nutritional disorders.

4. Natural disasters

4.2 Drought

4.2 Drought

7. Intrinsic

7.4 Genetic

7.4 Inbreeding

8. Trade:

8A. Is the taxon in trade? (Yes) Type of trade:: Local Commercial

8B. Parts in Trade: Live animal, Meat — Domestic International

8C. Which form of trade (specified form) is resulting in a perceived or inferred population decline?

Small cross border trade between Oman and UAE. Suspected of having a local effect on population. Trade in throat glands suggested before, but lack of further information on this makes the possibility speculative. Reports of young tahr collected from local bedu near Hatta which are destined as gifts for important people suggests that live animals are being traded.

9-10. Population numbers and

9A. Avg. age of parents in pop: 0 Years

	Total Pop.	Mature
9B. Global Population:	< 10,000	< 10,000

10A. Recent past trends: Unknown — Specify: declining, stable, or increasing

Rate of decline (past) <10% — For what period (years) 5

10B. Will population decline?

. Predicted Rate (future) <10% — For what period (years)

11. Population Data quality

11A. Estimates base on: Census or monitoring, Indirect information, Field study, Museum records, Informal sightings, Literature, Hearsay/belief

Notes:

11B. Qualifiers: *Observed, Inferred, Suspected, Estimated, or Projected*

11C. Uncertainty: *95% confidence, Minimum/Maximum values, Range of Opinion; Evidentiary; Precautionary; Subjective; Hypothetical; Point estimate; or Range estimate*

12. Recent Field Studies

Researcher names, Location, Dates, Topics:

Mike Smith, Lanral Ruddock - 2000 - 2001 - general research, field work.
Insall 1994, 1995, 1999 - Tahr Ecology
Al-Majani Diet of the Arabian Tahr in Wadi Sereen, Oman. Unpublished MSc thesis, SAU

Part Two

Hemitragus jayakari **Arabian tahr**

13. Status (previous):

13A. IUCN Red List categ;- Global: Endangered (C2a) National: Endangered (UAE)

13I. IUCN Red List Categ (Current) Vulnerable 13J. Criteria basis: C2a (version Feb 2000)

13B. Cites: Unlisted 13C. Natl wildlife Legislation: UAE - general hunting ban, Sultanate of Oman, protected against hunting and capture.

13D. Natl Red Data Book: Oman - EN 13E. Intl Red Data Book: Endangered

13F. Other legislation:

13G. Protected area presence: Thriving population in Wadi Surin Wildlife Reserve, Sultanate of Oman

13H. Endorsed protection plan:

Part Three

14. Supporting Research Is research recommended for taxon? (Yes)

Specify:			
Survey studies	Genetic research	Taxonomic research	Life history
	Limiting factor research	Epidemiology	Trade

14A. Is Population and Habitat Viability Assessment recommended? (Yes)

Notes:

15. Management recommendations for the taxon *Specify:*

Habitat management	Wild pop management	Monitoring	Translocation
Sustainable utilization	Public education	Genome Resource Banking	
Limiting factor mgt.	Captive breeding	Work in local communities	

Notes:

16. Captive management recommendations *If captive breeding recommended in Q15, is it for:*

Species recovery	Education	Reintroduction	Benign introduction
Research	Husbandry	Sustainable use	Preservation of live genome

Notes/other: With the addition of further expertise to the working group, epidemiology studies have a

17. Do Captive stocks already exist? (Yes)

17A. Names of facilities: Young tahr given as gifts to important people in the Al Ain area (Al Rohwa) suggest that some private collections may exist in the UAE.
BCEAW, Sharjah, UAE 1.0.0
Sir Bani Yas, Abu Dhabi, UAE 3.6.0
Omani Mammal Breeding Centre 16.9.0
Private collection in Abu Dhabi
Private collection on Sir Bani Yas, Abu Dhabi

17B. No. in captivity:

Males	Females:	Unsexed:	Total	Not known
20	15	0	35	

17C. Does a coordinated species management program exist for this species? (Yes)

If yes, specify UAE, Sharjah, BCEAW and Omani Breeding Center

Hemitragus jayakari **Arabian tahr**

17D. Is a coordinated Species Management Program recommended for range country(ies)? (Yes)

If yes, specify countries: Oman and UAE

18. Level of captive breeding/cultivation recommended

Ongoing ex situ program intensified or increased

19. Are techniques established to propagate the taxon?

Techniques known for this taxon or similar taxon

20. Other Comments : Captive management cooperation and investigation of general disease in all aspects. Lack of basic in-depth information is clear. Strong need for further research. There is little well supported data on any aspect of the biology of this species. To ensure conservation action is successful, information is needed on the size of natural areas needed to support the social unit (believed to be one male, one female and a kid); on all aspects of migration of tahr including verification; on epidemiology of diseases acquired from livestock; verification of trends in rangeland improvement and deterioration of waterholes easily available to tahr but not to man or his livestock.

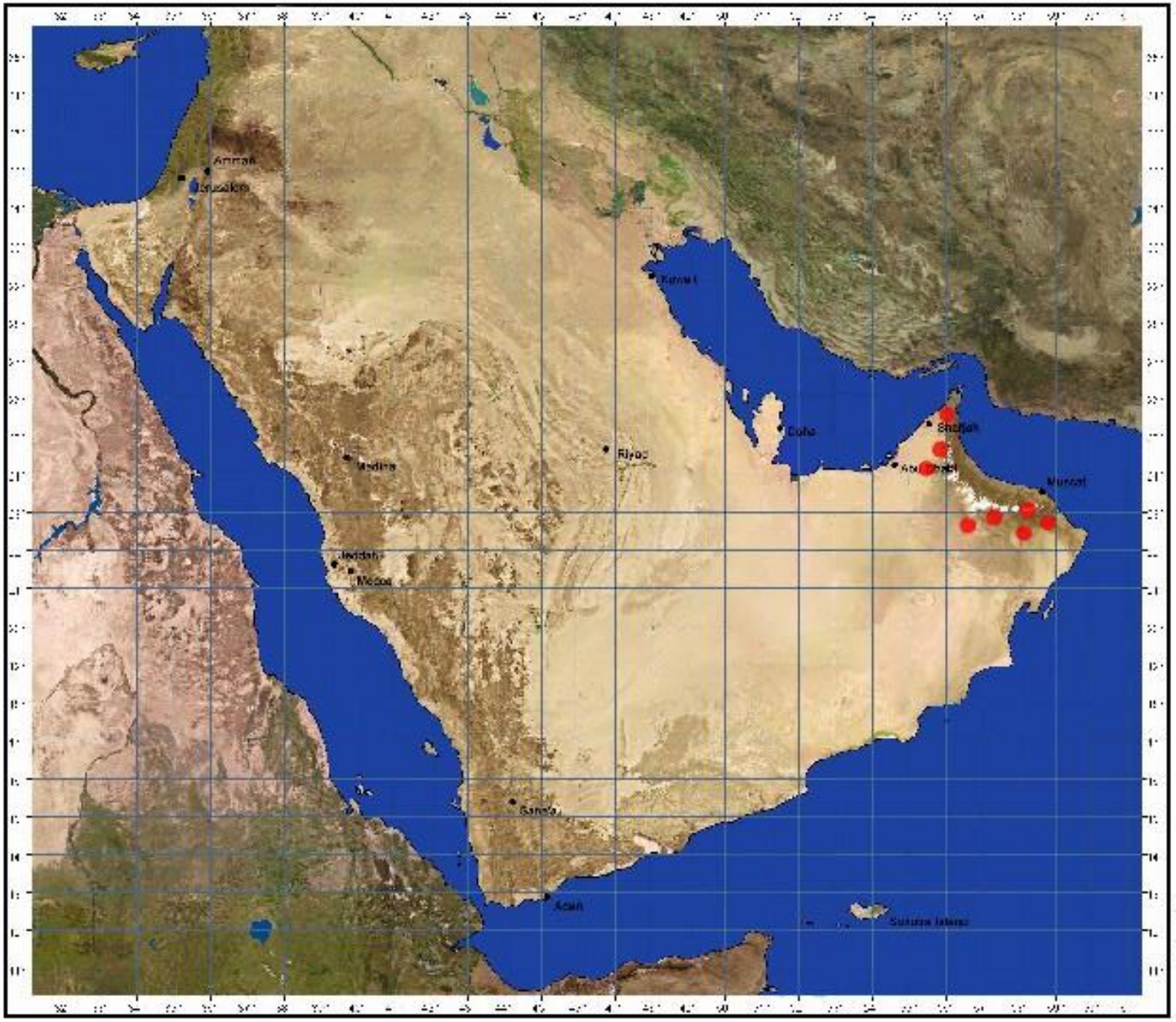
Part Four

21. Sources:

Insall, David, 1999. A review of the Ecology and Conservation Status of the Arabian Tahr. M.
Fisher, S.A. Ghanzafar and A Spalton (Eds) The Natural History of Oman. A. Festschrift for
Michael Gallagher, pp 129 - 146. Backhuys Publisher.
Munton, Paul, 1985, The Ecology of the Arabian Tahr. Journal of Oman Studies, Vol. 8 (Pt.
1) pp. 11 - 48.
Munton, Paul. 1988. Comparison of Tahr and Gazelle Populations. In Conservation and Biology of Desert Antelopes, Dixon, A. and David Jones, Eds, Zoological Society of London,
Christopher Helm, London pp. 182 - 192.

22. Compilers: Lanral Ruddock, Abdulaziz Al Midfa, Mohammed Abul Hashem, Richard Wood, Difaullah Al Shalan, Dr. Qassem N. Al Qhatani, Nagi S. Thowabeh, Dr. Ayoub Al-Balushi, Tariq Al
Mukhaini, Dr. Azhar Abhas, Dr. Jacob Mwanzia, Katalin Szemerady, Nayif Al-Omaiyreen.

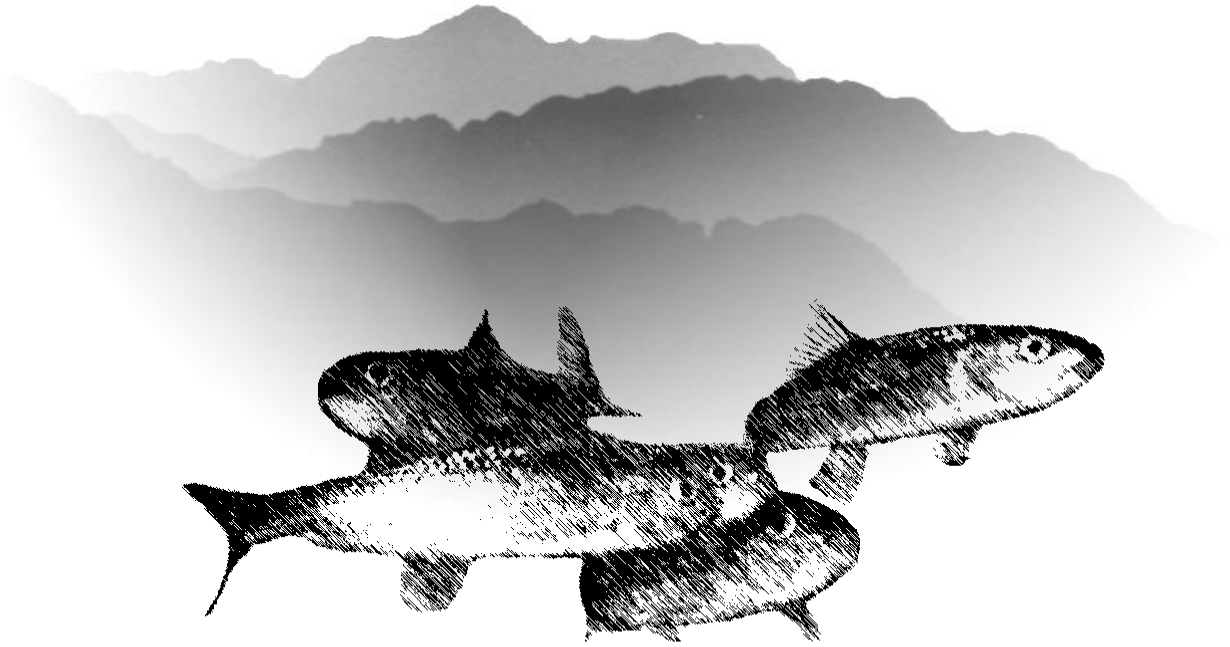
23. Reviews:



Hemitragus jayakari

Fish of Arabia's Mountain Habitat

All species



Conservation Assessment and Management Plan Workshop 2002

Section 7

Freshwater Fish Group Report

Facilitator: Fareed Krupp
Reporter: Gordon McGregor Reid
Recorders: Nashat Hamidan, Catherine Tsagarakis and Damien Egan

Group members:

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Naser Mohammed Obaid
Moawia Ahmed Hag Osman
Gordon McGregor Reid
Pritpal Soorae
Majid Makky Taher
Catherine Tsagarakis

Freshwater Fish Group Executive Summary

The Fish Group met for the first time to evaluate the current state of knowledge of the comparatively little known freshwater fish fauna of the Arabian Peninsula. The freshwater fishes are often considered to be un-charismatic and of little interest. However, a strong recognition emerged from the Group that freshwater fishes are an important component of regional biodiversity, which must be conserved. The newly formed Fish Group was not in a position to formulate a comprehensive conservation strategy or provide a detailed action plan with goals within the time available. Nevertheless, nine separate conservation actions were recommended which could reasonably be progressed before the next workshop meeting in 2003. The 16 members of the Fish Group included representatives from governmental and non-governmental agencies in the region and there were external participants with taxonomic, ecological, geographical, piscicultural and other relevant expertise. While the geographical coverage provided by the representatives is broad, there is a need for Yemen to be included in further group meetings, in view of its substantial list of freshwater fishes, including several endemic species. Jordan should also continue to be represented, from its two freshwater fish species, which have Arabian Peninsular affinities. However, on good zoogeographical grounds, the remaining 16 Jordanian species are not considered to be a characteristic Arabian peninsular ichthyofauna, and so were excluded from the present analysis.

Fareed Krupp and Nashat Hamidan gave presentations in the plenary sessions on the status and significance of the peninsular ichthyofauna. The Fish Group then reviewed the available scientific and general literature - which, while often of good quality, is rather sparse and often 10-30 or more years old. On the basis of this review, the best current estimate is that there are 20 freshwater fish species existing in the Arabian Peninsula, with cyprinid or "carp-like" taxa predominant. A draft checklist is attached and available data were compiled in individual taxon data sheets.

There have been few recent field surveys of natural freshwater habitats (many of which are now known to be under a high level of threat from human impacts) and there is a justified concern that some fish species or populations may be in severe decline - or perhaps in some cases extinct, or on the verge of extinction. To clarify this issue, rapid field assessment surveys are a high priority for immediate action throughout the region. The precise taxonomic status of some species, subspecies and populations remains obscure. Hence, new surveys should, where possible, combine traditional taxonomic and ecological methods with contemporary techniques for genetic analysis of populations, such as micro-satellite DNA sampling.

The group discussed the status of certain high profile species evidently under threat and including: the cyprinids *Acanthobrama hadiyanhensis, Barbus exulatus, Garra dunsirei, G. ghorensis, G. longipinnis*; and the cyprinodont *Aphanius sirhani*. Of particular interest is the Omani blind cave fish (a subterranean form of *Garra barreimiae*) .
The main threats to freshwater fishes in the region were itemized, notably including drought, habitat destruction and habitat fragmentation and the introduction of alien invasive species such as *Tilapia*, which may out-compete and displace the indigenous fish fauna. The Group developed formal 'problem statements' regarding threats, conservation strategies, research and documentation priorities, legislation requirements, education and awareness issues, and the great overarching need for regional cooperation to protect the freshwater fishes of the Arabian Peninsula.

Recommendations for conservation

Since the freshwater fish fauna of the Arabian Peninsula had not previously been included in the Conservation Assessment and Management Plan (CAMP) process, it was not possible to set out a detailed strategy and specific goals for the 20 species presently recognised. Instead, the Fish Group drew up a list of recommended actions, which are thought to be achievable before the next CAMP workshop in 2003.

10. *Field surveys should be conducted in order to obtain recent data on the distribution of all freshwater fish species. The Group considered certain fish species to be a particularly high priority, because of a dearth of up-to-date information, coupled with concerns about adverse changes to their habitats (list attached).*

11. *The Group identified the need to standardise field survey techniques and Fareed Krupp undertook to provide a standard field survey protocol to be distributed to interested parties by the Breeding Centre for Endangered Arabian Wildlife, Sharjah.*

12. *It was agreed that Damien Egan at the BCAEW act as a co-ordinator and collator for field surveys and reports, and specimens collected for identification. In all such matters, the intellectual property rights of the contributor or agency would be protected.*

13. *Those Group members representing government agencies or NGOs in the respective countries would seek formal clarification from the relevant authorities that freshwater habitats and freshwater fish are recognised in (and enjoy the full protection of) legislation concerning wildlife and the environment per country.*

14. *The Group recommends that, where possible, the scientific names of indigenous freshwater fish be included as a schedule in by-laws or executive orders under wildlife or environmental protection legislation. In this regard, the group welcomed the kind offer from the Yemeni delegate Mr Naji Saleh Thowabeh to incorporate freshwater fish species in Yemeni by-laws currently being developed.*

15. *Group members in parts of the UAE with responsibility for mosquito vector control using fishes will recommend a moratorium on the use of the potentially invasive indigenous species* Aphanius dispar *as a mosquito larvivore in wadi systems (as distinct from its safe use in irrigation tanks in farms where there is no connection to natural water bodies).*

16. *The potential threat from invasive species posed by existing and future commercial fish farming projects in the region involving exotic taxa requires investigation. Group members will seek to obtain data on existing and proposed projects per country before the next workshop in 2003.*

17. *In view of the importance of the Yemeni contribution to freshwater fish biodiversity in Arabia, it was recommended that a research worker from that country attend the next CAMP workshop. An ichthyologist working at Mukalla University, Dr. Atallah M. Ali, may be available to assist the Group.*

18. *Fish Group members will take steps to secure, maintain and breed captive populations of the fish species for their areas or assist in establishing such 'insurance' populations. Damien Egan of the BCAEW undertook to coordinate such activities, where appropriate.*

Report on the freshwater fishes

1. Observations on taxonomy, zoogeography, ecology and conservation

It was agreed that the current literature is not comprehensive in relation to the inventory of fish species distribution. Not all Group members were familiar with the entire ichthyofaunal list and so it was agreed to consider all taxa in a single session rather than break-out into separate discussion groups. The Group dealt with specific examples and filled in separate Taxon Data Sheets (collated list appended).

The first item for general discussion was whether or not Jordan should be included in the taxonomic inventory. Excluding the Jordan river drainage basin of Jordan, there are 20 species of primary and secondary freshwater fish in the Arabian Peninsula (including Azaq Oasis and the southern Dead Sea drainage of Jordan).If the entire territory of Jordan was included, another 16 species could be added to the list.

It was agreed on zoogeographical grounds to exclude, for now, the Jordanian ichthyofauna, save two species which have Arabian Peninsular affinities: *Garra ghorensis* Krupp, 1982 and *Aphanius sirhani* Villwock, Scholl & Krupp, 1983.

Aphanius dispar dispar (Rüppell, 1828)*:* It was noted that this widely distributed native cyprinodontid may represent a threat to other indigenous fish when it is introduced as a mosquito control agent outside of its natural geographical range. It is characteristically a surface feeder, but having eliminated mosquito larvae in an area it then changes its habits to mid-water or bottom feeding, and so may out compete native species having the same feeding habits.

Garra ghorensis: Was recognised as a cyprinid species with a very restricted distribution in Jordan. It also occurred in Palestine, where it has been eradicated by the Israelis in the 1950s. Few specimens were recorded at the typelocality by F. Krupp in 1999. Other recent observations by N. Hamidan (back to August 2001) indicate that this species may now be absent from habitats within its known range of geographical distribution . Water engineering work, agricultural and domestic pollution appear to be primary causes for the decline of *G. ghorensis.*

Cyprinion microphthalmum muscatensis (Boulenger, 1887): Two records in South East UAE; probably thirty populations in UAE and Oman. There is a restricted distribution in the Southern UAE because of a lack of suitable habitats. Seasonal flooding may allow genetic exchange between populations, which otherwise have a fragmented distribution. Introduced *Tilapia* may, through ecological competition, pose a threat to some populations. Some wadis in Oman are sprayed with pesticide to control the larvae of malarious mosquito species. The pesticides used may (depending on type) adversely affect *C. m. muscatensis* and other species in the area.

C. m. muscatensis: Produce a large number of eggs – it is assumed that a large female may lay about 5000. Growth is slow in aquarium conditions (but may be faster in nature) and sexual maturity is evidently not reached before two years. Detailed life history studies are urgently needed. The status of wild populations is largely unknown.

Garra barreimiae (surface-dwelling form): Occurs in north-eastern Oman and the eastern UAE and is more widely distributed than other species of Garra in this area. Like all widespread Arabian cyprinids, it has a disjunct distribution and is typical of springs and fast running perennial rivers. Besides the nominal subspecies, *G.b. shawkahensis* Banister & Clarke, 1977 and *G.b. gallagheri* Krupp, 1988 are recognised.

Garra barreimiae (cave-dwelling form): A "blind" population of this species was first recorded from caves in the Jabal Akhdhar mountains in Oman by Banister (1984). This population is now commonly recognised as the 'Omani blind cave fish'. Banister and subsequent authors recognised this population as a form of *G. barreimiae*. The working group considered that further genetical, morphological, and ecological research is required to resolve the question of the genetic distance from surface population. For now it is essential for conservation purposes to manage this population, which merits inclusion in the IUCN *Red Data Book,* separately. Omani blind cave fish have been bred in captivity at Chester Zoo, University of Hamburg, and Arabia's Breeding Centre for Endangered Arabian Wildlife in Sharjah-UAE (BCAEW). While this has secured important "insurance" populations, the precise factors contributing to a successful spawning are not clear. Further investigations are required in order to obtain consistent results. The maturation period in this cave dweller may be as much as 11 years, which is long for a small cyprinid fish. Elsewhere, sexual maturity in small, surface dwelling cyprinids is often reached between one and three years.

Garra longipinnis Banister and Clarke, 1977, a close relative of *G. barreimiae*, is only known from a very small population in Jabal Akhdhar, Oman. The species has not been observed after 1968. Recent visitors to the type locality failed to find any evidence of its continued existence. However, the species occurs in an enclosed military area, which is not easily accessible. This may, after all, have prevented it from being extinct. Further systematic field studies are urgently needed.

Awaous aeneofuscus (Peters, 1852): The only freshwater goby species known from the region. It is a species with a wide distribution in freshwater, brackish and marine coastal habitats of the Indo-Pacific. Within the Arabian Peninsula it is distributed in UAE, Oman and Yemen including Socotra Island. In the UAE it is commonly called the 'Hatta goby', because it is only known from an isolated population in Hatta Cave.

There is no available life history data and, so far, it has not been bred in captivity. It is not clear whether they reproduce in freshwater, but the degree of isolation makes this probable. Only the Arabian population has been considered here because, on initial investigations, there is not a substantial body of information on populations distributed elsewhere.

Among other high profile Arabian freshwater fish species the Group noted *Aphanius sirhani* (Villwock, Scholl & Krupp, 1983) from Jordan. The Azraq killifish occurs in a single in a single population in Azraq Oasis and is severely threatened by water abstraction resulting in severe lowering of the water table, habitat destruction and the introduction of exotic species. Jordan's Royal Society for the Conservation of Nature has initiated a rescue programme, including captive breeding, which may serve as a model for the region.

The shortfin eel, *Anguilla bicolor* McClelland, 1844, is widely distributed in the Indo-Pacific realm. In Arabia it is only known from a few so far unpublished records in Oman and Yemen, including Socotra. Although it is widely distributed, population densities are obviously very low.

Aphanius dispar richardsoni (Boulenger, 1907) is the only widely recognized subspecies of *A. dispar*. It occurs with an estimated 10 subpopulations in the Dead Sea valley, and is highly threatened by habitat loss due to water abstraction and, to a lesser extent, by pollution. A continuous decline in populations has been observed.

The large barbine cyprinids of western Arabia need urgent attention. *Barbus arabicus* Trewavas, 1941 and *Carasobarbus apoensis* (Banister & Clarke, 1977) are the largest primary freshwater fishes in Arabia, reaching more than 45cm in total length. They still occur in large numbers, but they have become popular game fish and the abstraction of the largest specimens from their natural populations is adversely affecting their reproductive success. Water abstraction and other forms of habitat loss also threaten them. The third species, *Carasobarbus exulatus* (Banister & Clarke, 1977) is only known from two localities in Yemen. It has not been observed or collected for more than half a century and its status is unknown.

The small leucisine cyprinid *Acanthobrama hadiyahensis* Coad, Alkahem & Behnke, 1983 may be Arabia's most endangered freshwater fish. This species, which is endemic to the upper course of Wadi Hadiyah in western Saudi Arabia, is the only example of a freshwater fish with Palaearctic affinities in the entire peninsula. It was last observed in the 1970's. In 1990 F. Krupp failed to find the species in Wadi Hadiyah and a new visit to the area to check its status and develop a conservation programme is highly recommended.

Western and southwestern Arabian *Cyprinion* are still common, but like all species in the area threatened by water abstraction and other forms of habitat loss. *Cyprinion mhalensis* Alkahem & Behnke, 1983 occurs in 5-10 subpopulations in the eastern part of the Sarawat escarpment. The second species, *Cyprinion acinaces* Banister & Clarke, 1983, has two distinct subspecies. While the nominal subspecies occurs in a number of locations in Yemen and southwestern Saudi Arabia, *C.a.hijazi* Krupp, 1983 is only known from four subpopulations in central and northwestern Saudi Arabia.

Garra is the most specious genus of western and southwestern Arabia. Like all other freshwater species in the region, *Garra* suffers from the threats mentioned here above for *Barbus*, *Carasobarbus* and *Cyprinion*. Some species, such as *G. buettikeri* Krupp, 1983, *Garra sahilia* Krupp, 1983 and *Garra tibanica* Trewavas, 1941 are widely distributed and the continued existence of their populations is, for the time being, of least concern. However, since all of them occur in a number of isolated populations, genetic studies are recommended. Other western and southern Arabian species of *Garra* have a very limited distribution and they must be considered threatened, endangered or critically endangered. These include *G. dunsirei* Banister, 1987, which is only known from a single cave in Dhofar, Oman, *G. lautior* Banister, 1987 and *G. mamshuqa* Krupp, 1983 from Wadi Hadramaut, Yemen. The latter two species are only known from museum specimens and have not been observed alive for more than five decades.

2. Threats to indigenous freshwater fish fauna

What are the major threats and problems that face freshwater fish in the Arabian Peninsula? The Group determined these as:

- Natural drought and man induced fluctuation in water tables, likely exacerbated by global warming.
- Competition in water utilization between human groups resulting in habitat deterioration and fragmentation.
- Habitat destruction due to development.
- Damming, which eliminate the flowing water habitat favoured by many indigenous species - and which also prevents fish migrations for breeding, feeding or other ecological reasons. Dams may also cause siltation of habitats and loss of spawning or feeding grounds.
- The introduction of alien, invasive species for purposes of aquaculture or sport fishing, notably *Tilapia*.
- There is so far no ecosystem approach to the management of freshwater fish habitats.
- Management intervention, where it exists, is not set in the context of comparative economic evaluations.
- There is a lack of supporting research data.
- There is little awareness or interest in freshwater fish among the public, and the responsible authorities and decision-makers who determine policy and law.
- Because of this, there is no official recognition of fish as important components of regional biodiversity, which should receive the appropriate statutory protection and active conservation measures applied in the field.
- There is no clear legislative framework and there are no freshwater protected areas.
- There is insufficient regional co-operation and co-ordination in the development of conservation strategies and policies including a re-introduction policy for captive-bred fishes.

The Group summarised these concerns under six headings ordered by general priority - but not necessarily in a logical sequence in terms of programme development (e.g. threats must be determined in advance of developing a conservation strategy):

1. Conservation strategies
2. Research and documentation
3. Legislation and enforcement
4. Education and awareness
5. Threats
6. Regional co-operation

3. Problem statements in conserving the freshwater fish fauna

The Group developed six problem statements based on the above priority list:

1) Conservation strategies

The present utilisation of freshwater resources is unsustainable. A co-ordinated ecosystem approach to freshwater fish conservation has not been adopted. IUCN guidelines for re-introduction and those for prevention of biodiversity loss through invasive species are both ignored in the aquatic context. Practises associated with farming exotic species of fish often run counter to conservation. The protected area concept is not being used to conserve freshwater fishes.

2) Research and documentation

Conservation and management of Arabia's freshwater fish resources are hampered by a shortage of specialists at a national level and by the fact that the available data are often 10-30 years old. There are no commonly agreed research strategies and freshwater fish have not been identified as a priority by the conservation agencies. The information available is not readily accessible, and there is no regional database.

3) Legislation

Existing legislation throughout the region does not address the specific requirements of freshwater habitat conservation or fish species conservation.
Responsible agencies are often lacking clear terms of references and inter-agency co-ordination is inadequate. Where the relevant legislation exists, enforcement is generally weak.

4) Education and Awareness:

There is an overall understanding of the importance of the freshwater resource in the Arabian Peninsula. However, there is insufficient awareness at all levels of society of the economic, ecological and aesthetic value of freshwater ecosystems, particularly freshwater fish. This deficit is due to: 1) un-targeted environmental education 2) the fact that freshwater fish are generally considered to be small, inconspicuous, uncharismatic and low-profile taxa.

5) Threats

Healthy natural populations of Arabia's freshwater fish are already challenged by desertification, habitat deterioration, fragmentation, and the loss of habitats through unsustainable water abstraction, often resulting in salt-water intrusion. Other threats include pollution - both domestic and agricultural - and the introduction of alien, invasive species of fish. Major root causes include an excessive demand for water by people, a diminishing freshwater supply, human encroachment on freshwater habitats, inappropriate agricultural practices, and the presence of livestock beyond carrying capacity, which disturbs and degrades aquatic ecosystems.

6) Regional co-operation

Freshwater habitats and species (and conservation problems) exist across boundaries but are not managed co-operatively, so far. In tackling these problems there is no central resource or database for the Arabian Peninsula.

Annex 1: List of Freshwater Fishes of the Arabian Peninsula:

Species with a very limited distribution, which must be considered endangered or critically endangered, are marked with an asterisk (*).

Primary Freshwater Fishes:

Cyprinidae

1. *Acanthobrama hadiyahensis* Coad, Alkahem & Behnke, 1983 *
2. *Barbus arabicus* Trewavas, 1941
3. *Carasobarbus exulatus* (Banister & Clarke, 1977) *
4. *Carasobarbus apoensis* (Banister & Clarke, 1977)
5. *Cyprinion acinaces* Banister & Clarke, 1977
6. *Cyprinion mhalensis* Alkahem & Behnke, 1983
7. *Cyrpinion microphthalmum muscatensis* (Boulenger, 1887)
8. *Garra barreimiae* Fowler & Steinitz, 1956
9. *Garra buettikeri* Krupp, 1983
10. *Garra dunsirei* Banister, 1987 *
11. *Garra ghorensis* Krupp, 1982 *
12. *Garra lautior* Banister, 1977
13. *Garra longipinnis* Banister & Clarke, 1977 *
14. *Garra mamshuqa* Krupp, 1983
15. *Garra sahilia* Krupp, 1983
16. *Garra tibanica* Trewavas, 1941

Secondary Freshwater Fishes:

Anguillidae

17. *Anguilla bicolor* McClelland, 1844

Cyprinodontidae

18. *Aphanius dispar* (Rüppell, 1828)
19. *Aphanius sirhani* Villwock, Scholl & Krupp, 1983 *

Gobiidae

20. *Awaous aeneofuscus* (Peters, 1852)

Annex 2: Fish References

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Banister, K.E. 1984. a subterranean population of *Garra barreimiae* (Teleostei: Cyprinidae) from Oman, with comments on the concept of regressive evolution. *Journal of Natural History* 18: 927-938. London.

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Conservation Assessment Management Plan
Taxon Data Sheet

Threatened Fauna of Arabia's Mountain Habitat 12 February 2002

Acanthobrama hadiyahensis Page 1 **None**

1.Scientific *Acanthobrama hadiyahensis* Coad; Alkahem & Behnke, 1983

1A. Synonyms: Scientific synonym / ambiguities Authority (date)

None

1B. Scientific nomenclature:

FAMILY: Cyprinidae
ORDER: Cypriniformes
CLASS: Actinopterygii

1C. Common Names: None

1D.Taxonomic level: Species

Notes:

2. Distribution of the Taxon **Country(ies)**

Primary(yes)

2A.Life form (plant): Saudi Arabia

2B. Habitat:

2C. Niche: Wadi and spring

2D. Historical distrib: Saudi Arabia

2E. Current countries: Saudi Arabia

2F. Geograph. extent: Wadi Hadiya, Khaibar

2G Migration regions:

3. Approximate Area of Occurrence of the taxon in and around the area of study/ sighting/ collection

(Extent of occurrence is defined as the area contained within the shortest continuous imaginary boundary encompassing all known, inferred or projected sites of present occurrence of the taxon)

Occurrence area: < 100 sq km

Notes (Occurrence)

4. Approximate Area of Occupancy of the taxon in and around the area of study/ collection

(Area of occupancy is defined as the area occupied by the taxon within the 'extent of occurrence')

Area of Occupancy: < 10 sq km

Notes (Occupancy):

5. No. of Locations or Subpopulations in which the taxon is distributed: 2

Is there a continuous declined in subpopulations / locations?

Are there extreme fluctuations in subpopulations/ locations?

Percentage of population that lives in most important subarea:

Notes (subpops)

6. Habitat status: Fragmented

6A. Is there any change in the habitat where the taxon occurs? (Yes)

If yes, describe: Unknown

6B. If decreasing, what has been the decrease in Habitat area?

Acanthobrama hadiyahensis **None**

approximate change (%): over how many years:
Notes on decrease:

6C. If stable or unknown, do you predict a decline in habitat?
approximate change (%): over how many years:

6D. State primary cause of change:

6E. Is there any change in the quality of the habitat where the taxon occurs? (Yes)
If yes, Describe: Unknown

6F. State primary cause of change:

Notes:

7. Threats

	Rank	Present	Future	Lead to decline	Notes on future threats

8. Trade:

8A. Is the taxon in trade? (Yes) Type of trade:: Local Commercial
8B. Parts in Trade: Domestic International
8C. Which form of trade (specified form) is resulting in a perceived or inferred population decline?

9-10. Population numbers and

9A. Avg. age of parents in pop: Years

	Total Pop.	Mature
9B. Global Population:	Unknown	

10A. Recent past trends: Unknown Specify: declining, stable, or increasing
Rate of decline (past) For what period (years)
10B. Will population decline?
. Predicted Rate (future) For what period (years)

11. Population Data quality

11A. Estimates base on: Census or monitoring, Field study, Informal sightings, Indirect information, Museum records, Literature, Hearsay/belief
Notes:

11B. Qualifiers: *Observed, Inferred, Suspected, Estimated, or Projected*

11C. Uncertainty *95% confidence, Minimum/Maximum values, Range of Opinion; Evidentiary; Precautionary; Subjective; Hypothetical; Point estimate; or Range estimate*

12. Recent Field Studies

Researcher names, Location, Dates, Topics:
None

Part Two

13. Status

(previous):
13A. IUCN Red List categ;- Global: None National:
13I. IUCN Red List Categ (Current) Critically endangered 13J. Criteria basis: B1a,b and B2a,b
13B. Cites: 13C. Natl wildlife Legislation:
13D. Natl Red Data Book: 13E. Intl Red Data Book:
13F. Other legislation:

Acanthobrama hadiyahensis **None**

13G. Protected area presence:

13H. Endorsed protection plan:

Notes:

Part Three

14. Supporting Research Is research recommended for taxon? (Yes)

Specify:	Genetic research	Taxonomic research	Life history
Survey studies	Limiting factor research	Epidemiology	Trade

14A. Is Population and Habitat Viability Assessment recommended? (Yes)

Notes:

15. Management recommendations for the taxon *Specify:*

Habitat management	Wild pop management	Monitoring	Translocation
Sustainable utilization	Public education	Genome Resource Banking	
Limiting factor mgt.	Captive breeding	Work in local communities	

Notes:

16. Captive management recommendations *If captive breeding recommended in Q15, is it for:*

Species recovery	Education	Reintroduction	Benign introduction
Research	Husbandry	Sustainable use	Preservation of live genome

Notes/other:

17. Do Captive stocks already exist? (Yes)

17A. Names of facilities:

17B. No. in captivity:

Males	Females:	Unsexed:	Total	Not known
0	0	0	0	

17C. Does a coordinated species management program exist for this species? (Yes)

If yes, specify

17D. Is a coordinated Species Management Program recommended for range country(ies)? (Yes)

If yes, specify Saudi Arabia

18. Level of captive breeding/cultivation recommended

Initiate ex situ Program within 3 years

19. Are techniques established to propagate the taxon?

Techniques not known at all

20. Other Comments Species only known form 12 museum specimens (11 types, one non-type specimen); last observed in 1981, uncertain whether species still exists.

Part Four

21. Sources:

Coad, B.W.; Alkahem, H.F. and Behnke, R.J. 1983 Acanthobrama hadiyahensis, a new species of cyprinid fish from Saudi Arabia. National Museums of Canada. Publications in Natural Sciences, No. 2, 6pp. Ottawa

22. Compilers:

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Acanthobrama hadiyahensis **None**

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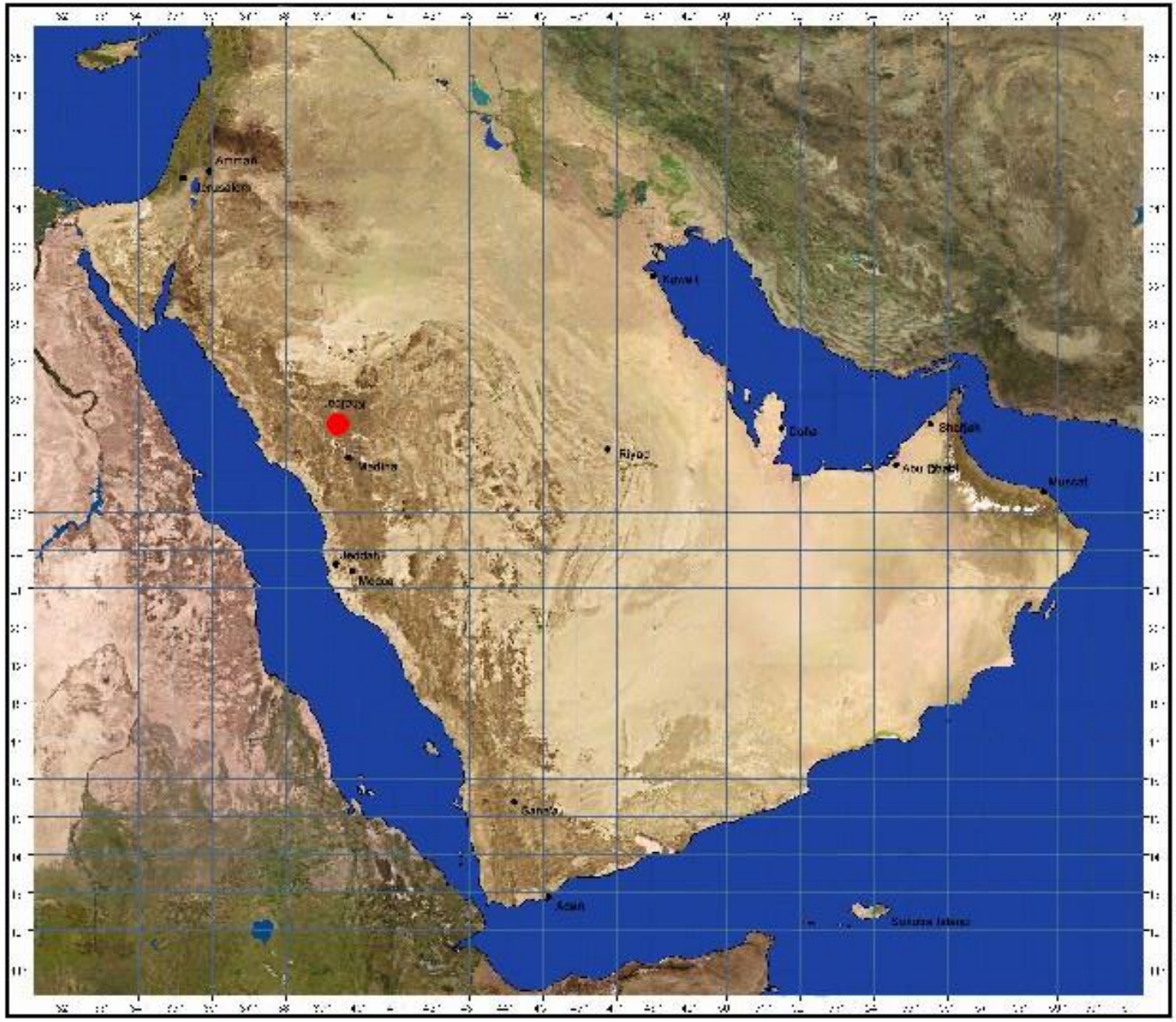

Acanthobrama hadiyahensis

Conservation Assessment Management Plan
Taxon Data Sheet

Anguilla bicolor **shortfin eel**

1.Scientific *Anguilla bicolor* McClelland, 1844

1A. Synonyms: Scientific synonym / ambiguities Authority (date)
none from Arabia

1B. Scientific nomenclature:
FAMILY: Angillidae
ORDER: Auguilliformes
CLASS: Actinopterygii

1C. Common Names: shortfin eel English

1D.Taxonomic level: Species

Notes:

2. Distribution of the Taxon **Country(ies)**
Primary(yes)

2A.Life form (plant): Yemen
Oman

2B. Habitat:

2C. Niche: Habitat specificity: Wadis, estuaries and sea

2D. Historical distrib: Oman,Yemen

2E. Current countries: Oman,Yemen

2F. Geograph. extent: Oman, Yemen: Coastal Drainages of Gulf of Oman, Arabian Sea, Gulf of Aden, including Socotra

2G Migration regions:

3. Approximate Area of Occurrence of the taxon in and around the area of study/ sighting/ collection
(Extent of occurrence is defined as the area contained within the shortest continuous imaginary boundary encompassing all known, inferred or projected sites of present occurrence of the taxon)

Occurrence area: > 20,000 sq km

Notes (Occurrence)

4. Approximate Area of Occupancy of the taxon in and around the area of study/ collection
(Area of occupancy is defined as the area occupied by the taxon within the 'extent of occurrence')

Area of Occupancy: 11-500 sq km

Notes (Occupancy):

5. No. of Locations or Subpopulations in which the taxon is distributed: 1

Is there a continuous declined in subpopulations / locations?

Are there extreme fluctuations in subpopulations/ locations?

Percentage of population that lives in most important subarea:

Notes (subpops)

6. Habitat status: Continuous

6A. Is there any change in the habitat where the taxon occurs? (Yes)
If yes, describe:

6B. If decreasing, what has been the decrease in Habitat area?
approximate change (%): over how many years:

Anguilla bicolor **shortfin eel**

Notes on decrease:

6C. If stable or unknown, do you predict a decline in habitat?

approximate change (%): over how many years:

6D. State primary cause of change:

6E. Is there any change in the quality of the habitat where the taxon occurs? (Yes)

If yes, Describe:

6F. State primary cause of change:

Notes:

7. Threats

	Rank	Present	Future	Lead to decline	Notes on future threats

8. Trade:

8A. Is the taxon in trade? (Yes) Type of trade:: Local Commercial

8B. Parts in Trade: Domestic International

8C. Which form of trade (specified form) is resulting in a perceived or inferred population decline?

9-10. Population numbers and

9A. Avg. age of parents in pop: 0 Years

	Total Pop.	Mature
9B. Global Population:	Unknown	> 10,000

10A. Recent past trends: Unknown Specify: declining, stable, or increasing

Rate of decline (past) For what period (years)

10B. Will population decline?

. Predicted Rate (future) For what period (years)

11. Population Data quality

11A. Estimates base on: Census or monitoring, Indirect information, Field study, Museum records, Informal sightings, Literature, Hearsay/belief

Notes:

11B. Qualifiers: *Observed, Inferred, Suspected, Estimated, or Projected*

11C. Uncertainty *95% confidence, Minimum/Maximum values, Range of Opinion; Evidentiary; Precautionary; Subjective; Hypothetical; Point estimate; or Range estimate*

12. Recent Field Studies

Researcher names, Location, Dates, Topics:

Krupp, F. and Naseeb, F.; Socotra, Yemen, 2000, Inventory

Part Two

13. Status

(previous):

13A. IUCN Red List categ;- Global: National:

13I. IUCN Red List Categ (Current) Least Concern 13J. Criteria basis:

13B. Cites: 13C. Natl wildlife Legislation:

13D. Natl Red Data Book: 13E. Intl Red Data Book:

13F. Other legislation:

Anguilla bicolor **shortfin eel**

13G. Protected area presence:

13H. Endorsed protection plan:

Notes:

Part Three

14. Supporting Research Is research recommended for taxon? (Yes)

Specify:	Genetic research	Taxonomic research	Life history
Survey studies	Limiting factor research	Epidemiology	Trade

14A. Is Population and Habitat Viability Assessment recommended? (Yes)

Notes:

15. Management recommendations for the taxon *Specify:*

Habitat management	Wild pop management	Monitoring	Translocation
Sustainable utilization	Public education	Genome Resource Banking	
Limiting factor mgt.	Captive breeding	Work in local communities	

Notes:

16. Captive management recommendations *If captive breeding recommended in Q15, is it for:*

Species recovery	Education	Reintroduction	Benign introduction
Research	Husbandry	Sustainable use	Preservation of live genome

Notes/other:

17. Do Captive stocks already exist? (Yes)

17A. Names of facilities:

17B. No. in captivity:

Males	Females:	Unsexed:	Total	Not known
0	0	0	0	

17C. Does a coordinated species management program exist for this species? (Yes)

If yes, specify

17D. Is a coordinated Species Management Program recommended for range country(ies)? (Yes)

If yes, specify

18. Level of captive breeding/cultivation recommended

No ex situ program recommended

19. Are techniques established to propagate the taxon?

Techniques not known at all

20. Other Comments Worldwide distribution from Western Central Pacific to Eastern Africa. Adult in Freshwater, spawns in the sea

Part Four

21. Sources: No published data

22. Compilers: Damien Egan
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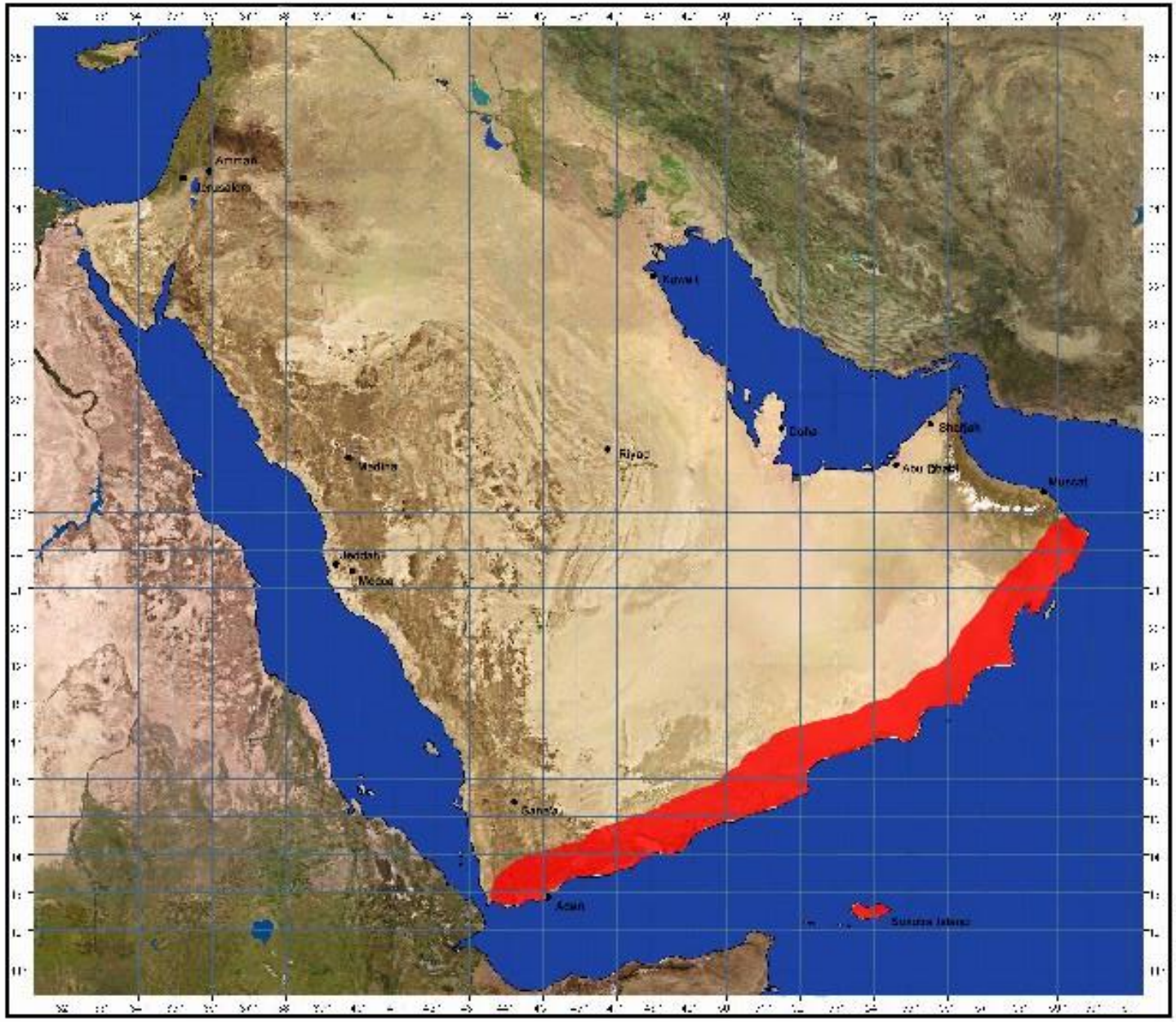

Anguilla bicolor

0 100 200 300 400 500 Kilometers

Conservation Assessment Management Plan
Taxon Data Sheet

1.Scientific *Aphanius dispar dispar* Rueppell, 1828

1A. Synonyms:	Scientific synonym / ambiguities	Authority (date)
	A. Lebias velifer	Ehrenberg in Cuv. & Val., 1846
	B. Cyprinodon lunalatus	Val. In Cuv. & Val., 1846
	C. Cyprinodon stoliczkanus	Day, 1872
	D. Cyprinodon ginaonis	Holly, 1929
	E. Cyprinodon cilensis	Gianferrari, 1930
	F. Cyprinodon darrorensis	Gianferrari, 1932
	G. Cyprinodon zaccarinii	Gianferrari, 1933

1B. Scientific nomenclature:

FAMILY:	Cyprinodontidae
ORDER:	Cyprinodontiformes
CLASS:	Actinopterygii

1C. Common Names: Arabian killifish English

1D.Taxonomic level: Subspecies

Notes: Also Somalia, Djibouti

2. Distribution of the Taxon

Primary(yes)

2A.Life form (plant):

2B. Habitat:

2C. Niche: Habitat specificity: Estuaries but also any water body, permanent streams, swamps, permanent lakes, pools, springs, oases, brackish lakes, near shore marine areas, coral reefs, ponds, water storage areas, drainage channels.

2D. Historical distrib: Arabia - Somalia to Egypt, India to Iraq, in fresh water, brackish and shallow marine areas.

2E. Current countries: Arabia - Somalia to Egypt, India to Iraq, and eastern Mediterranean in fresh water, brackish and shallow marine areas

Country(ies)

Bahrain
Egypt
Eritrea
India
Iran
Jordan
Kuwait
Oman
Pakistan
Saudi Arabia
State of Qatar
Sudan
Sudan
United Arab Emirates
Yemen

2F. Geograph. extent:

2G Migration regions:

3. Approximate Area of Occurrence of the taxon in and around the area of study/ sighting/ collection

(Extent of occurrence is defined as the area contained within the shortest continuous imaginary boundary encompassing all known, inferred or projected sites of present occurrence of the taxon)

Occurrence area: > 20,000 sq km

Notes (Occurrence)

4. Approximate Area of Occupancy of the taxon in and around the area of study/ collection

(Area of occupancy is defined as the area occupied by the taxon within the 'extent of occurrence')

Area of Occupancy: > 2,001 sq km

Notes (Occupancy):

5. No. of Locations or Subpopulations in which the taxon is distributed:

Aphanius dispar dispar **Arabian killifish**

Are there extreme fluctuations in subpopulations/ locations?

Percentage of population that lives in most important subarea:

Notes (subpops)

6. Habitat status: Fragmented

6A. Is there any change in the habitat where the taxon occurs? (Yes)

If yes, describe: Increase in Area

6B. If decreasing, what has been the decrease in Habitat area?

approximate change (%): over how many years:

Notes on decrease:

6C. If stable or unknown, do you predict a decline in habitat?

approximate change (%): over how many years:

6D. State primary cause of change: Many hundreds of subpopulations. Artificial introduction, migration through Suez Canal

6E. Is there any change in the quality of the habitat where the taxon occurs? (Yes)

If yes, Describe:

6F. State primary cause of change:

Notes:

7. Threats

	Rank	Present	Future	Lead to decline	Notes on future threats
2. Direct Loss/Exploitation					
2.3. Accidental mortality					
2.3.5 Poisoning					
3. Indirect Effects					
3.2. Alien invasive species					
3.2.1 Competitors					Alien species competition with Gambusia and Tilapia for freshwater Aphanius specimens
3.3. Ecological imbalance					
3.3.5. Habitat loss due to exotic animals					Alien species competition with Gambusia and Tilapia for freshwater Aphanius specimens
4. Natural disasters					
4.2 Drought					
4.2 Drought					
6. Pollution					
6.1 Chemical					
6.1 Pesticides/chemical pollution					

8. Trade:

8A. Is the taxon in trade? (Yes) Type of trade:: Local Commercial

8B. Parts in Trade: Domestic International

8C. Which form of trade (specified form) is resulting in a perceived or inferred population decline?

9-10. Population numbers and

9A. Avg. age of parents in pop: 2 Years

Aphanius dispar dispar **Arabian killifish**

Trends

	Total Pop.	Mature	
9B. Global Population:	> 10,000	> 10,000	
10A. Recent past trends:	Increasing	Increasing	Specify: declining, stable, or increasing
Rate of decline (past)			For what period (years)
. Predicted Rate (future)			For what period (years)

11. Population Data quality

11A. Estimates base on: Census or monitoring; Indirect information; Field study; Museum records; Informal sightings; Literature; Hearsay/belief

Notes:

11B. Qualifiers: *Observed, Inferred, Suspected, Estimated, or Projected*

11C. Uncertainty *95% confidence, Minimum/Maximum values, Range of Opinion; Evidentiary; Precautionary; Subjective; Hypothetical; Point estimate; or Range estimate*

12. Recent Field Studies

Researcher names, Location, Dates, Topics:
T. Mueller, Arabian Gulf, 1993, oil pollution

Part Two

13. Status

(previous):

13A. IUCN Red List categ;- Global: National:

13I. IUCN Red List Categ (Current) Least Concern 13J. Criteria basis:

13B. Cites: 13C. Natl wildlife Legislation:

13D. Natl Red Data Book: 13E. Intl Red Data Book:

13F. Other legislation:

13G. Protected area presence:

13H. Endorsed protection plan:

Notes:

Part Three

14. Supporting Research Is research recommended for taxon? (Yes)

Specify: Genetic research; Taxonomic research; Life history; Survey studies; Limiting factor research; Epidemiology; Trade

14A. Is Population and Habitat Viability Assessment recommended? (Yes)

Notes:

15. Management recommendations for the taxon *Specify:*

Habitat management; Wild pop management; Monitoring; Translocation; Sustainable utilization; Public education; Genome Resource Banking; Limiting factor mgt.; Captive breeding; Work in local communities

Notes:

16. Captive management recommendations *If captive breeding recommended in Q15, is it for:*

Aphanius dispar dispar **Arabian killifish**

Species recovery	Education	Reintroduction	Benign introduction
Research	Husbandry	Sustainable use	Preservation of live genome

Notes/other:

17. Do Captive stocks already exist? (Yes)

17A. Names of facilities: Dubai Electricity and Water Authority, Breeding Centre for Endangered Arabian Wildlife, Sharjah

17B. No. in captivity:	Males	Females:	Unsexed:	Total	Not known
	0	0	1000	1000	

17C. Does a coordinated species management program exist for this species? (Yes)

If yes, specify

17D. Is a coordinated Species Management Program recommended for range country(ies)? (Yes)

If yes, specify

18. Level of captive breeding/cultivation recommended

19. Are techniques established to propagate the taxon?

20. Other Comments Most common and widespread inland water fish species in Arabia, secondary fresh water fish

Part Four

21. Sources:

Krupp, F. 1983. Freshwater fishes of Saudi Arabia and adjacent regions of the Arabian peninsula. - Fauna of Saudi Arabia 5: 568 - 636. Basle & Jeddah.

Villwock, W., Scholl, A. & Krupp, F. 1983. Zur Taxonomie, Verbreitung und Speziation des Formenkreises Aphanius dispar (Ruepell, 1828) und Beschreibung von Aphanius sirhani n.sp. (Pisces: Cyprinodontidae).- Mitteilungen aus dem hamburgischen zoologischen Museum und Institut 80: 251 - 277. Hamburg.

22. Compilers:

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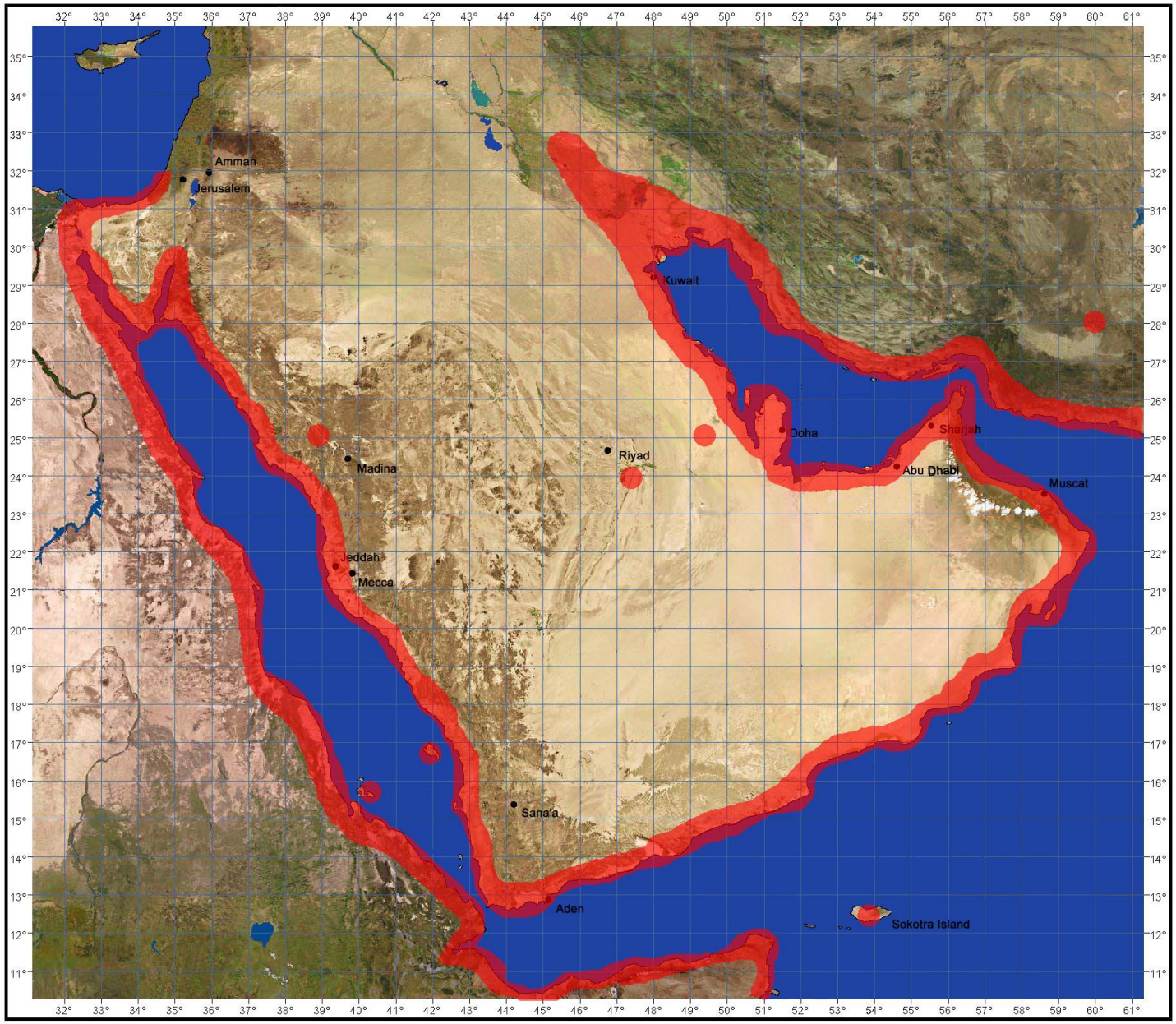
Fareed Krupp
John Balfour
Majid Makky Taher
Nasser Sultan AL-Muraikhi
Mohammed Mahmoud AL Marzouqi
Naser Mohammed Obaid

23. Reviews:



Aphanius dispar

N

0 100 200 300 400 500 Kilometers

Mapping by GIS Unit
Environmental Research & Wildlife Development Agency
PO Box 45553
Abu Dhabi
United Arab Emirates

Conservation Assessment Management Plan
Taxon Data Sheet

Aphanius dispar richardsoni **Dead Sea killifish**

1.Scientific *Aphanius dispar richardsoni* (Boulenger, 1907)

1A. Synonyms: Scientific synonym / ambiguities | Authority (date)

none

1B. Scientific nomenclature:

FAMILY: Cyprinodontidae
ORDER: Cyprinodontiformes
CLASS: Actinopterygii

1C. Common Names: Dead Sea killifish

1D.Taxonomic level: Subspecies

Notes:

2. Distribution of the Taxon **Country(ies)**

Primary(yes)

2A.Life form (plant): Jordan
Palestine

2B. Habitat:

2C. Niche: Habitat specificity: Slow flowing parts of wadi.

2D. Historical distrib: Jordan, Palestine

2E. Current countries: Jordan, Palestine

2F. Geograph. extent: Dead Sea Drainage basin

2G Migration regions:

3. Approximate Area of Occurrence of the taxon in and around the area of study/ sighting/ collection

(Extent of occurrence is defined as the area contained within the shortest continuous imaginary boundary encompassing all known, inferred or projected sites of present occurrence of the taxon)

Occurrence area: 101-5,000 sq km

Notes (Occurrence)

4. Approximate Area of Occupancy of the taxon in and around the area of study/ collection

(Area of occupancy is defined as the area occupied by the taxon within the 'extent of occurrence')

Area of Occupancy: < 10 sq km

Notes (Occupancy):

5. No. of Locations or Subpopulations in which the taxon is distributed: 10

Is there a continuous declined in subpopulations / locations?

Are there extreme fluctuations in subpopulations/ locations?

Percentage of population that lives in most important subarea:

Notes (subpops)

6. Habitat status: Fragmented

6A. Is there any change in the habitat where the taxon occurs? (Yes)

If yes, describe: Decrease in Area

6B. If decreasing, what has been the decrease in Habitat area?

Aphanius dispar richardsoni **Dead Sea killifish**

approximate change (%): 21% to 50% over how many years: 5

Notes on decrease:

6C. If stable or unknown, do you predict a decline in habitat?

approximate change (%): over how many years:

6D. State primary cause of change: Pumping of water

If yes, Describe: Decrease in quality

6F. State primary cause of change:

Notes: Pollution

7. Threats

	Rank	Present	Future	Lead to decline	Notes on future threats
3. Indirect Effects					
3.2. Alien invasive species					
3.2.5 Habitat loss					Pollution and habitat loss
4. Natural disasters					
4.2 Drought					
4.2 Drought					Pollution and habitat loss
6. Pollution					
6.2 Industrial					
6.2 Industrial pollution					Pollution and habitat loss

8. Trade:

8A. Is the taxon in trade? (Yes) Type of trade:: Local Commercial

8B. Parts in Trade: Domestic International

8C. Which form of trade (specified form) is resulting in a perceived or inferred population decline?

9-10. Population numbers and

9A. Avg. age of parents in pop: 1 Years

	Total Pop.	Mature
9B. Global Population:	unknown	2,500 or more

10A. Recent past trends: Declining Specify: declining, stable, or increasing

Rate of decline (past) 20% or less For what period (years) 10

10B. Will population decline?

. Predicted Rate (future) For what period (years)

11. Population Data quality

11A. Estimates base on: Census or monitoring Field study Informal sightings

Indirect information Museum records Literature

Notes: Hearsay/belief

11B. Qualifiers: *Observed, Inferred, Suspected, Estimated, or Projected*

11C. Uncertainty *95% confidence, Minimum/Maximum values, Range of Opinion; Evidentiary; Precautionary; Subjective; Hypothetical; Point estimate; or Range estimate*

12. Recent Field Studies

Researcher names, Location, Dates, Topics:

Aphanius dispar richardsoni **Dead Sea killifish**

Part Two

13. Status

(previous):

13A. IUCN Red List categ;- Global: National: Vulnerable

13I. IUCN Red List Categ (Current) Vulnerable 13J. Criteria basis: B1a, B2a

13B. Cites: 13C. Natl wildlife Legislation:

13D. Natl Red Data Book: 13E. Intl Red Data Book:

13F. Other legislation:

13G. Protected area presence:

13H. Endorsed protection plan:

Notes:

Part Three

14. Supporting Research

Is research recommended for taxon? (Yes)

Specify:	Genetic research	Taxonomic research	Life history
Survey studies	Limiting factor research	Epidemiology	Trade

14A. Is Population and Habitat Viability Assessment recommended? (Yes)

Notes:

15. Management recommendations for the taxon

Specify:

Habitat management	Wild pop management	Monitoring	Translocation
Sustainable utilization	Public education	Genome Resource Banking	
Limiting factor mgt.	Captive breeding	Work in local communities	

Notes:

16. Captive management recommendations

If captive breeding recommended in Q15, is it for:

Species recovery	Education	Reintroduction	Benign introduction
Research	Husbandry	Sustainable use	Preservation of live genome

Notes/other:

17. Do Captive stocks already exist? (Yes)

17A. Names of facilities: Hamburg, Palestine

17B. No. in captivity:

Males	Females:	Unsexed:	Total	Not known
0	0	0	0	

17C. Does a coordinated species management program exist for this species? (Yes)

If yes, specify

17D. Is a coordinated Species Management Program recommended for range country(ies)? (Yes)

If yes, specify

18. Level of captive breeding/cultivation recommended

No ex situ program recommended

19. Are techniques established to propagate the taxon?

Techniques known for this taxon or similar taxon

Aphanius dispar richardsoni **Dead Sea killifish**

20. Other Comments

Part Four

21. Sources:

Krupp, F. 1983. Freshwater fishes of Saudi Arabia and adjacent regions of the Arabian peninsula.-Fauna of Saudi Arabia 5: 568 - 636. Basle & Jeddah.

Krupp, F. & Schneider, W. 1989. The fishes of the Jordan River drainage basin and Azraq Oasis.-Fauna of Saudi Arabia 10: 347 - 416. Basle & Riyadh.

Villwock, W., Scholl, A. & Krupp, F. 1983. Zur Taxonomie, Verbreitung und Speziation des Formenkreises Aphanius dispar (Rueppell, 1828) und Beschreibung von Aphanius sirhani n.sp. (Pisces: Cyprinodontidae).- Mitteilungen aus dem hamburgischen zoologischen Museum und Institut 80: 251 - 277. Hamburg.

22. Compilers:

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Mohammed Mahmoud AL Marzouqi
Naser Mohammed Obaid

23. Reviews:

Conservation Assessment Management Plan
Taxon Data Sheet

1.Scientific *Aphanius sirhani* Villwock, Scholl & Krupp, 1983

1A. Synonyms: Scientific synonym / ambiguities Authority (date)

1B. Scientific nomenclature:

FAMILY: Cyprinodontidae
ORDER: Cyprinodontiformes
CLASS: Actinopterygii

1C. Common Names: Azraq killifish English
Samak sirhani Arabic

1D.Taxonomic level: Species

Notes:

2. Distribution of the Taxon **Country(ies)**
Primary(yes)

2A.Life form (plant): Jordan

2B. Habitat:

2C. Niche: Habitat specificity: wetlands and oases, shallow

2D. Historical distrib: Jordan - Azraq

2E. Current countries: Jordan - Azraq

2F. Geograph. extent: Jordan - Azraq

2G Migration regions:

3. Approximate Area of Occurrence of the taxon in and around the area of study/ sighting/ collection
(Extent of occurrence is defined as the area contained within the shortest continuous imaginary boundary encompassing all known, inferred or projected sites of present occurrence of the taxon)

Occurrence area: < 100 sq km

Notes (Occurrence)

4. Approximate Area of Occupancy of the taxon in and around the area of study/ collection
(Area of occupancy is defined as the area occupied by the taxon within the 'extent of occurrence')

Area of Occupancy: < 10 sq km

Notes (Occupancy):

5. No. of Locations or Subpopulations in which the taxon is distributed: 1

Is there a continuous declined in subpopulations / locations?

Are there extreme fluctuations in subpopulations/ locations?

Percentage of population that lives in most important subarea:

Notes (subpops)

6. Habitat status: Continuous

6A. Is there any change in the habitat where the taxon occurs? (Yes)

If yes, describe: Decrease in Area

6B. If decreasing, what has been the decrease in Habitat area?

Aphanius sirhani **Azraq killifish**

approximate change (%): >80% over how many years: 15
Notes on decrease:

6C. If stable or unknown, do you predict a decline in habitat?
approximate change (%): over how many years:

6D. State primary cause of change:

If yes, Describe: Decrease in quality

6F. State primary cause of change:

Notes: Due to pumping

7. Threats

	Rank	Present	Future	Lead to decline	Notes on future threats
3. Indirect Effects					
3.3. Ecological imbalance					
3.3.5 Habitat loss					
3.3.5. Habitat loss due to exotic animals					
3.3.5. Habitat loss due to exotic plants					
4. Natural disasters					
4.2 Drought					
4.2 Drought					

8. Trade:

8A. Is the taxon in trade? (Yes) Type of trade:: Local Commercial
8B. Parts in Trade: Domestic International

8C. Which form of trade (specified form) is resulting in a perceived or inferred population decline?

9-10. Population numbers and

9A. Avg. age of parents in pop: 1 Years

	Total Pop.	Mature
9B. Global Population:	< 2,500	< 250

10A. Recent past trends: Declining Specify: declining, stable, or increasing
Rate of decline (past) 80% or more For what period (years) 20
10B. Will population decline?
. Predicted Rate (future) For what period (years)

11. Population Data quality

11A. Estimates base on: Census or monitoring Field study Informal sightings
Indirect information Museum records Literature
Notes: Hearsay/belief

11B. Qualifiers: *Observed, Inferred, Suspected, Estimated, or Projected*

11C. Uncertainty *95% confidence, Minimum/Maximum values, Range of Opinion; Evidentiary; Precautionary; Subjective; Hypothetical; Point estimate; or Range estimate*

12. Recent Field Studies

Aphanius sirhani **Azraq killifish**

Researcher names, Location, Dates, Topics:
Toni Weissenbacher, et. Al. June 2001, Current situation of A. sirhani

Part Two

13. Status

	(previous):		
13A. IUCN Red List categ;- Global:	None	National:	
13I. IUCN Red List Categ (Current)	Critically endangered	13J. Criteria basis:	A2, B2a, C2 (ii) (February, 2000)

13B. Cites: 13C. Natl wildlife Legislation:

13D. Natl Red Data Book: 13E. Intl Red Data Book:

13F. Other legislation:

13G. Protected area presence:

13H. Endorsed protection plan:

Notes:

Part Three

14. Supporting Research Is research recommended for taxon? (Yes)

Specify:			
Survey studies	Genetic research	Taxonomic research	Life history
	Limiting factor research	Epidemiology	Trade

14A. Is Population and Habitat Viability Assessment recommended? (Yes)

Notes:

15. Management recommendations for the taxon *Specify:*

Habitat management	Wild pop management	Monitoring	Translocation
Sustainable utilization	Public education	Genome Resource Banking	
Limiting factor mgt.	Captive breeding	Work in local communities	

Notes:

16. Captive management recommendations *If captive breeding recommended in Q15, is it for:*

Species recovery	Education	Reintroduction	Benign introduction
Research	Husbandry	Sustainable use	Preservation of live genome

Notes/other:

17. Do Captive stocks already exist? (Yes)

17A. Names of facilities: Royal Society for the Conservation of Nature, Jordan (RSCN)

17B. No. in captivity:

Males	Females:	Unsexed:	Total	Not known
0	0	1200	1200	

17C. Does a coordinated species management program exist for this species? (Yes)

If yes, specify Jordan (RSCN)

17D. Is a coordinated Species Management Program recommended for range country(ies)? (Yes)

If yes, specify

18. Level of captive breeding/cultivation recommended

Ongoing ex situ program intensified or increased

Aphanius sirhani **Azraq killifish**

19. Are techniques established to propagate the taxon?

20. Other Comments Keep captive program stable as it is.

Part Four

21. Sources:

Krupp, F. & Schneider, W. 1989. The fishes of the Jordan River drainage basin and Azraq Oasis.-Fauna of Saudi Arabia 10: 347 - 416. Basle & Riyadh.

Villwock, W., Scholl, A. & Krupp, F. 1983. Zur Taxonomie, Verbreitung und Speziation des Formenkreises Aphanius dispar (Rueppell, 1828) und Beschreibung von Aphanius sirhani n.sp. (Pisces: Cyprinodontidae).- Mitteilungen aus dem hamburgischen zoologischen Museum und Institut 80: 251 - 277. Hamburg.

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Nasser Sultan AL-Muraikhi
Mohammed Mahmoud AL Marzouqi
Naser Mohammed Obaid

23. Reviews:

Aphanius sirhani

0 100 200 300 400 500 Kilometers

Conservation Assessment Management Plan
Taxon Data Sheet

1.Scientific *Awaous aeneofuscus* (Peters, 1852)

1A. Synonyms: Scientific synonym / ambiguities Authority (date)

1B. Scientific nomenclature:
FAMILY: Gobiidae
ORDER: Perciformes
CLASS: Actinopterygii

1C. Common Names: freshwater goby

1D.Taxonomic level: Species

Notes:

2. Distribution of the Taxon **Country(ies)**
Primary(yes)

2A.Life form (plant):

Oman
Yemen-including Socotra

2B. Habitat:

2C. Niche: Slow flowing water and stagnant pools. Sand, gravels, boulders.

2D. Historical distrib: Oman, Yemen

2E. Current countries: Oman, Yemen

2F. Geograph. extent: Gulf of Oman, coast of Oman, suspected on the Arabian Gulf coast of Oman, Gulf of Aden, coast of Yemen, Socotra Island

2G Migration regions:

3. Approximate Area of Occurrence of the taxon in and around the area of study/ sighting/ collection
(Extent of occurrence is defined as the area contained within the shortest continuous imaginary boundary encompassing all known, inferred or projected sites of present occurrence of the taxon)

Occurrence area: > 20,000 sq km

Notes (Occurrence)

4. Approximate Area of Occupancy of the taxon in and around the area of study/ collection
(Area of occupancy is defined as the area occupied by the taxon within the 'extent of occurrence')

Area of Occupancy: < 10 sq km

Notes (Occupancy):

5. No. of Locations or Subpopulations in which the taxon is distributed: 15

Is there a continuous declined in subpopulations / locations?

Are there extreme fluctuations in subpopulations/ locations?

Percentage of population that lives in most important subarea:

Notes (subpops)

6. Habitat status: Fragmented

6A. Is there any change in the habitat where the taxon occurs? (Yes)
If yes, describe:

6B. If decreasing, what has been the decrease in Habitat area?

Awaous aeneofuscus **freshwater goby**

Notes on decrease:

6C. If stable or unknown, do you predict a decline in habitat?
approximate change (%): none predicted over how many years:

6D. State primary cause of change: approximate change (%): over how many years:

6E. Is there any change in the quality of the habitat where the taxon occurs? (Yes)
If yes, Describe: Stable

6F. State primary cause of change:

Notes:

7. Threats

	Rank	Present	Future	Lead to decline	Notes on future threats
3. Indirect Effects					
3.3. Ecological imbalance					
3.3.5. Habitat loss due to exotic animals					Pumping of water and damming

8. Trade:

8A. Is the taxon in trade? (Yes) Type of trade:: Local Commercial
8B. Parts in Trade: Domestic International

8C. Which form of trade (specified form) is resulting in a perceived or inferred population decline?

9-10. Population numbers and

9A. Avg. age of parents in pop: Years

	Total Pop.	Mature
9B. Global Population:	unknown	< 2,500

10A. Recent past trends: Stable Specify: declining, stable, or increasing

Rate of decline (past) For what period (years)

10B. Will population decline?

. Predicted Rate (future) For what period (years)

11. Population Data quality

11A. Estimates base on: Census or monitoring, Indirect information, Field study, Museum records, Informal sightings, Literature, Hearsay/belief

Notes:

11B. Qualifiers: *Observed, Inferred, Suspected, Estimated, or Projected*

11C. Uncertainty *95% confidence, Minimum/Maximum values, Range of Opinion; Evidentiary; Precautionary; Subjective; Hypothetical; Point estimate; or Range estimate*

12. Recent Field Studies

Researcher names, Location, Dates, Topics:
Feulner, Oman, 1996 - 1998
Feulner and Cunningham, Oman, 1999 (see briefing document)

Part Two

13. Status

(previous):

13A. IUCN Red List categ;- Global: National: Least Concern

Awaous aeneofuscus **freshwater goby**

13I. IUCN Red List Categ (Current) 13J. Criteria basis:

13B. Cites: 13C. Natl wildlife Legislation:

13D. Natl Red Data Book: 13E. Intl Red Data Book:

13F. Other legislation:

13G. Protected area presence:

13H. Endorsed protection plan:

Notes:

Part Three

14. Supporting Research Is research recommended for taxon? (Yes)

Specify:	Genetic research	Taxonomic research	Life history
Survey studies	Limiting factor research	Epidemiology	Trade

14A. Is Population and Habitat Viability Assessment recommended? (Yes)

Notes:

15. Management recommendations for the taxon *Specify:*

Habitat management	Wild pop management	Monitoring	Translocation
Sustainable utilization	Public education	Genome Resource Banking	
Limiting factor mgt.	Captive breeding	Work in local communities	

Notes:

16. Captive management recommendations *If captive breeding recommended in Q15, is it for:*

Species recovery	Education	Reintroduction	Benign introduction
Research	Husbandry	Sustainable use	Preservation of live genome

Notes/other:

17. Do Captive stocks already exist? (Yes)

17A. Names of facilities:

17B. No. in captivity:

Males	Females:	Unsexed:	Total	Not known
0	0	0	0	

17C. Does a coordinated species management program exist for this species? (Yes)

If yes, specify

17D. Is a coordinated Species Management Program recommended for range country(ies)? (Yes)

If yes, specify

18. Level of captive breeding/cultivation recommended

Initiate ex situ Program within 3 years

19. Are techniques established to propagate the taxon?

Techniques not known at all

20. Other Comments If captive breeding is initiated, given the limited number of specimen available locally, no more than 20 individuals should be collected

Part Four

21. Sources:

Feulner, G.R. 1988. Wadi fish of the UAE. Tribulus 8(2): 16-21.

Feulner, G.R. & Cunningham, P.L. 2000. The Freshwater Goby (Awaous aeneofuscus) in the Wadi Hatta watershed (UAE/Oman). Tribulus 10(1): 12-15.

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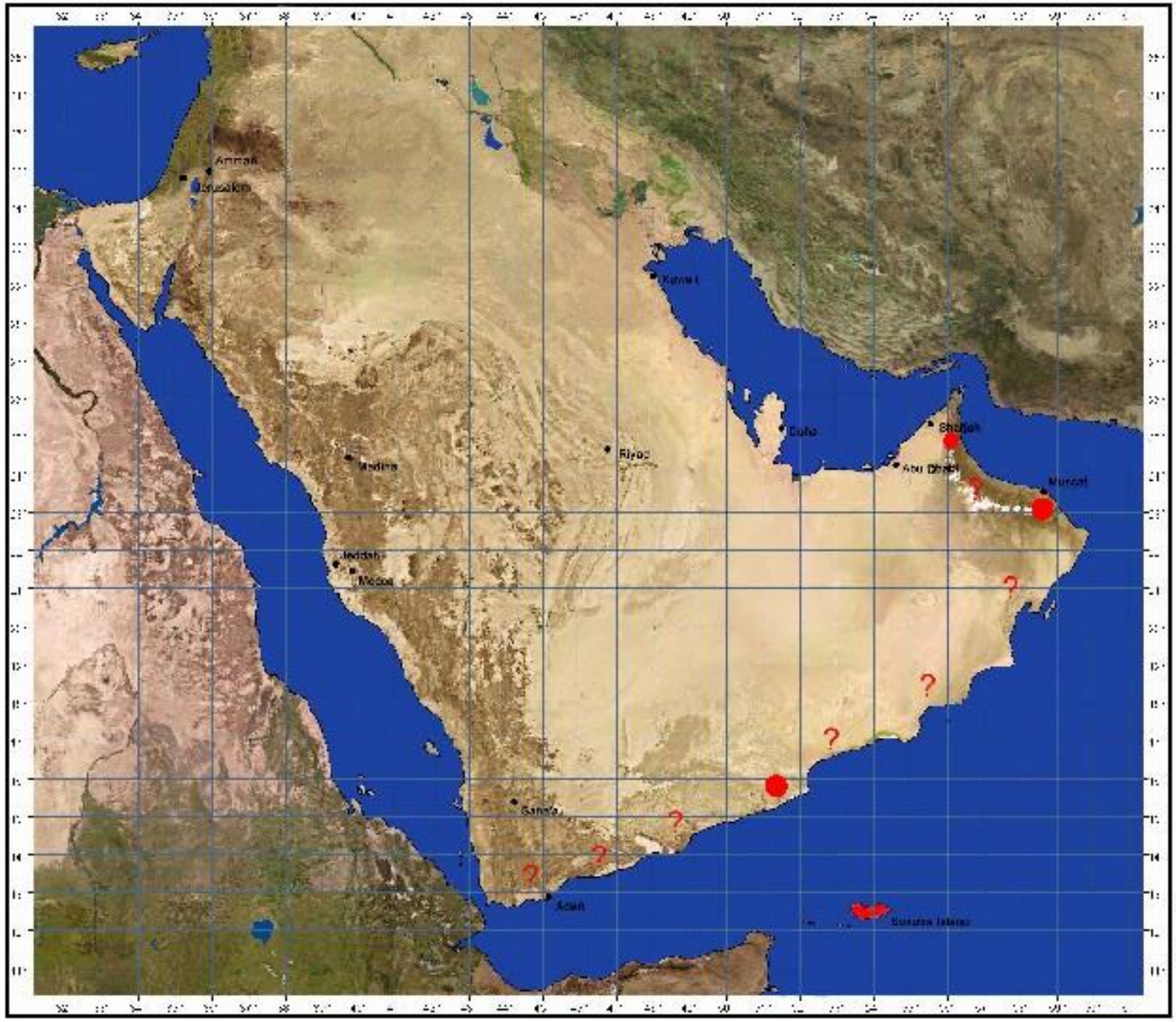
Majid Makky Taher
Nasser Sultan AL-Muraikhi
Mohammed Mahmoud AL Marzouqi

23. Reviews:



Awaous aeneofuscus

0 100 200 300 400 500 Kilometers

Conservation Assessment Management Plan
Taxon Data Sheet

1.Scientific *Barbus arabicus* Trewavas, 1941

1A. Synonyms: Scientific synonym / ambiguities | Authority (date)

None

1B. Scientific nomenclature:

FAMILY: Cyprinidae
ORDER: Cypriniformes
CLASS: Actinopterygii

1C. Common Names: None

1D.Taxonomic level: Species

Notes:

2. Distribution of the Taxon **Country(ies)**

Primary(yes)

2A.Life form (plant): Yemen
Saudi Arabia

2B. Habitat:

2C. Niche: Wide range of habitats, running freshwater wadis

2D. Historical distrib: Saudi Arabia, Yemen

2E. Current countries: Saudi Arabia, Yemen

2F. Geograph. extent: Yemen; Hadramaut to Red Sea drainage; Saudi Arabia: extreme south west

2G Migration regions:

3. Approximate Area of Occurrence of the taxon in and around the area of study/ sighting/ collection

(Extent of occurrence is defined as the area contained within the shortest continuous imaginary boundary encompassing all known, inferred or projected sites of present occurrence of the taxon)

Occurrence area: > 20,000 sq km

Notes (Occurrence)

4. Approximate Area of Occupancy of the taxon in and around the area of study/ collection

(Area of occupancy is defined as the area occupied by the taxon within the 'extent of occurrence')

Area of Occupancy: 11-500 sq km

Notes (Occupancy):

5. No. of Locations or Subpopulations in which the taxon is distributed: 10

Is there a continuous declined in subpopulations / locations?

Are there extreme fluctuations in subpopulations/ locations?

Percentage of population that lives in most important subarea:

Notes (subpops)

6. Habitat status: Fragmented

6A. Is there any change in the habitat where the taxon occurs? (Yes)

If yes, describe: Stable in Area

6B. If decreasing, what has been the decrease in Habitat area?

Barbus arabicus **None**

approximate change (%): over how many years:
Notes on decrease:

6C. If stable or unknown, do you predict a decline in habitat?
approximate change (%): over how many years:

6D. State primary cause of change:

6E. Is there any change in the quality of the habitat where the taxon occurs? (Yes)
If yes, Describe:

6F. State primary cause of change:

Notes: Number of populations estimated by the group: 10 - 20 (at least)

7. Threats

	Rank	Present	Future	Lead to decline	Notes on future threats
3. Indirect Effects					
3.2. Alien invasive species					
3.2.5 Habitat loss					
3.9 Other					
3.9 Other					Household pollution
6. Pollution					
6.2 Industrial					
6.2 Industrial pollution					

8. Trade:

8A. Is the taxon in trade? (Yes) Type of trade:: Local Commercial
8B. Parts in Trade: Domestic International

8C. Which form of trade (specified form) is resulting in a perceived or inferred population decline?

9-10. Population numbers and

9A. Avg. age of parents in pop: Years

	Total Pop.	Mature
9B. Global Population:	Unknown	

10A. Recent past trends: Unknown Specify: declining, stable, or increasing

Rate of decline (past) For what period (years)

10B. Will population decline?

. Predicted Rate (future) For what period (years)

11. Population Data quality

11A. Estimates base on: Census or monitoring, Field study, Informal sightings, Indirect information, Museum records, Literature, Hearsay/belief

Notes:

11B. Qualifiers: *Observed, Inferred, Suspected, Estimated, or Projected*

11C. Uncertainty *95% confidence, Minimum/Maximum values, Range of Opinion; Evidentiary; Precautionary; Subjective; Hypothetical; Point estimate; or Range estimate*

12. Recent Field Studies

Researcher names, Location, Dates, Topics:
None

Part Two

Barbus arabicus **None**

13. Status

(previous):

13A. IUCN Red List categ;- Global: None National:

13I. IUCN Red List Categ (Current) Least Concern 13J. Criteria basis:

13B. Cites: 13C. Natl wildlife Legislation:

13D. Natl Red Data Book: 13E. Intl Red Data Book:

13F. Other legislation:

13G. Protected area presence:

13H. Endorsed protection plan:

Part Three

14. Supporting Research Is research recommended for taxon? (Yes)

Specify:

Genetic research	Taxonomic research	Life history	
Survey studies	Limiting factor research	Epidemiology	Trade

14A. Is Population and Habitat Viability Assessment recommended? (Yes)

Notes:

15. Management recommendations for the taxon *Specify:*

Habitat management	Wild pop management	Monitoring	Translocation
Sustainable utilization	Public education	Genome Resource Banking	
Limiting factor mgt.	Captive breeding	Work in local communities	

Notes:

16. Captive management recommendations *If captive breeding recommended in Q15, is it for:*

Species recovery	Education	Reintroduction	Benign introduction
Research	Husbandry	Sustainable use	Preservation of live genome

Notes/other:

17. Do Captive stocks already exist? (Yes)

17A. Names of facilities:

17B. No. in captivity:

Males	Females:	Unsexed:	Total	Not known
0	0	0	0	

17C. Does a coordinated species management program exist for this species? (Yes)

If yes, specify

17D. Is a coordinated Species Management Program recommended for range country(ies)? (Yes)

If yes, specify

18. Level of captive breeding/cultivation recommended

No ex situ program recommended

19. Are techniques established to propagate the taxon?

Techniques not known at all

20. Other Comments

Barbus arabicus **None**

Part Four

21. Sources:

Alkahem, A.F. & Behnke, R.J. 1983. Freshwater fishes of Saudi Arabia.-Fauna of Saudi Arabia 5: 545 - 567. Basle & Jeddah.

Krupp, F. 1983. Freshwater fishes of Saudi Arabia and adjacent regions of the Arabian peninsula.-Fauna of Saudi Arabia 5: 568-636. Basle & Jeddah

22. Compilers:

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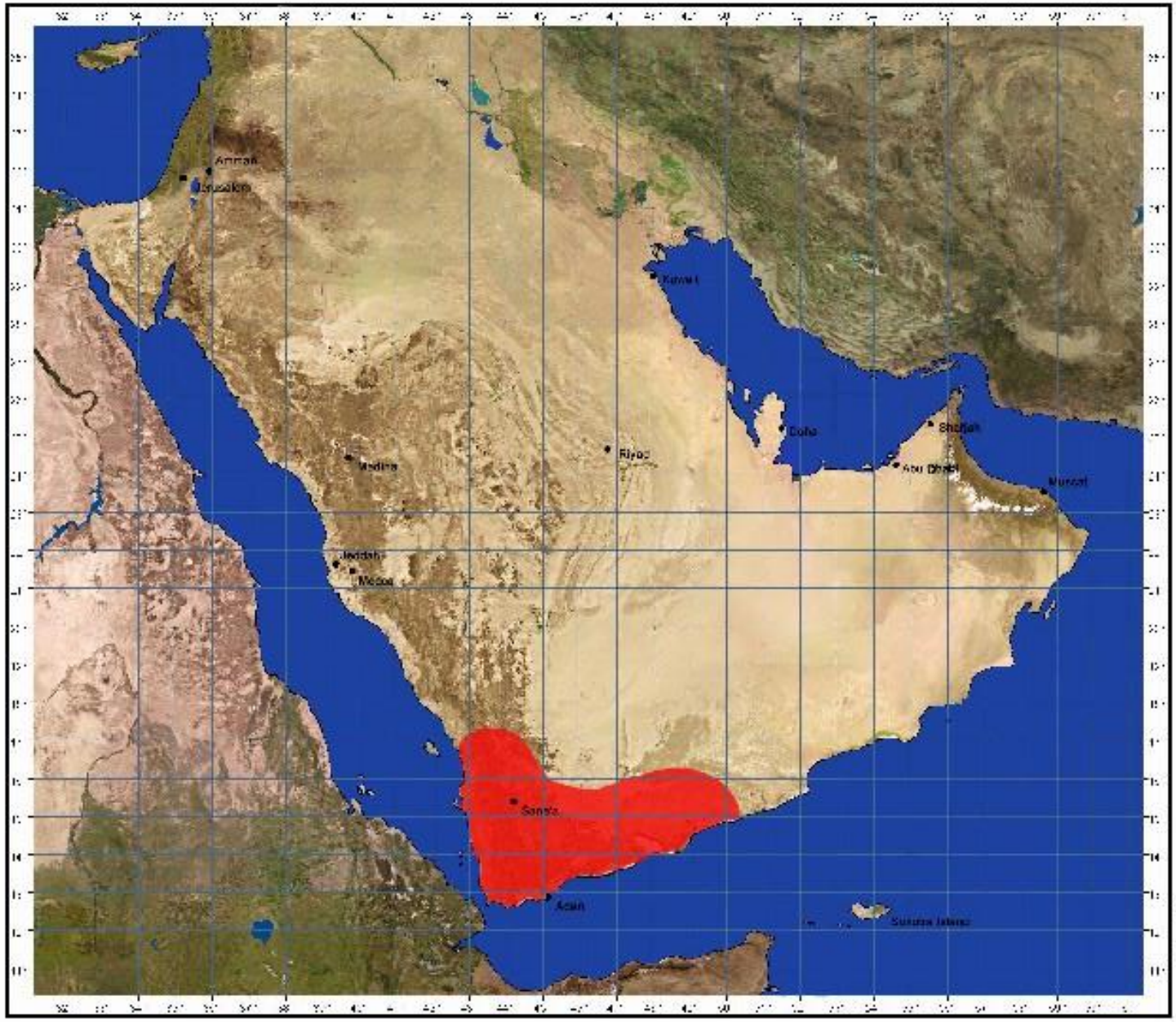
23. Reviews:



Barbus arabicus

0 100 200 300 400 500 Kilometers

Conservation Assessment Management Plan
Taxon Data Sheet

1.Scientific *Carasobarbus apoensis* Banister and Clarke, 1977

1A. Synonyms: Scientific synonym / ambiguities | Authority (date)

Barbus apoensis (Banister and Clarke, 1977)

1B. Scientific nomenclature:

FAMILY: Cyprinidae
ORDER: Cypriniformes
CLASS: Actinopterygii

1C. Common Names: None

1D.Taxonomic level: Species

Notes:

2. Distribution of the Taxon **Country(ies) Primary(yes)**

2A.Life form (plant): Saudi Arabia

2B. Habitat:

2C. Niche: Habitat specificity: Upper reaches of wadis in fresh water

2D. Historical distrib: Saudi Arabia

2E. Current countries: Saudi Arabia

2F. Geograph. extent: Southwestern Saudi Arabia inland drainage.

2G Migration regions:

3. Approximate Area of Occurrence of the taxon in and around the area of study/ sighting/ collection

(Extent of occurrence is defined as the area contained within the shortest continuous imaginary boundary encompassing all known, inferred or projected sites of present occurrence of the taxon)

Occurrence area: > 20,000 sq km

Notes (Occurrence)

4. Approximate Area of Occupancy of the taxon in and around the area of study/ collection

(Area of occupancy is defined as the area occupied by the taxon within the 'extent of occurrence')

Area of Occupancy: 11-500 sq km

Notes (Occupancy):

5. No. of Locations or Subpopulations in which the taxon is distributed: 3

Is there a continuous declined in subpopulations / locations?

Are there extreme fluctuations in subpopulations/ locations?

Percentage of population that lives in most important subarea:

Notes (subpops)

6. Habitat status: Fragmented

6A. Is there any change in the habitat where the taxon occurs? (Yes)

If yes, describe: Decrease in Area

6B. If decreasing, what has been the decrease in Habitat area?

Carasobarbus apoensis **None**

approximate change (%): 21% to 50% over how many years: 5

Notes on decrease:

6C. If stable or unknown, do you predict a decline in habitat?

approximate change (%): over how many years:

6D. State primary cause of change: Pumping water for domestic use

6E. Is there any change in the quality of the habitat where the taxon occurs? (Yes)

If yes, Describe:

6F. State primary cause of change:

Notes:

7. Threats

	Rank	Present	Future	Lead to decline	Notes on future threats
1. Habitat Loss (Human Induced)					
1.3. Development					
1.3.6 Dams					
2. Direct Loss/Exploitation					
2.1. Exploitation					
2.1.1. Fishing					Destructive fishing, overexploitation
3. Indirect Effects					
3.3. Ecological imbalance					
3.3.5 Habitat loss					
3.9 Other					
3.9 Other					Excessive pumping of water
4. Natural disasters					
4.2 Drought					
4.2 Drought					

8. Trade:

8A. Is the taxon in trade? (Yes) Type of trade:: Local Commercial

8B. Parts in Trade: Domestic International

8C. Which form of trade (specified form) is resulting in a perceived or inferred population decline?

9-10. Population numbers and

9A. Avg. age of parents in pop: Years

	Total Pop.	Mature	
9B. Global Population:	> 10,000	> 10,000	
10A. Recent past trends:	Declining	Declining	Specify: declining, stable, or increasing
Rate of decline (past)	20% or more		For what period (years)

10B. Will population decline?

. Predicted Rate (future) For what period (years)

11. Population Data quality

11A. Estimates base on: Census or monitoring Field study Informal sightings

Indirect information Museum records Literature

Notes: Hearsay/belief

11B. Qualifiers: *Observed, Inferred, Suspected, Estimated, or Projected*

Carasobarbus apoensis **None**

11C. Uncertainty — *95% confidence, Minimum/Maximum values, Range of Opinion; Evidentiary; Precautionary; Subjective; Hypothetical; Point estimate; or Range estimate*

12. Recent Field Studies

Researcher names, Location, Dates, Topics:

Part Two

13. Status

(previous):

13A. IUCN Red List categ;- Global: None National:

13I. IUCN Red List Categ (Current) Least Concern 13J. Criteria basis:

13B. Cites: 13C. Natl wildlife Legislation:

13D. Natl Red Data Book: 13E. Intl Red Data Book:

13F. Other legislation:

13G. Protected area presence:

13H. Endorsed protection plan:

Notes:

Part Three

14. Supporting Research Is research recommended for taxon? (Yes)

Specify:

Survey studies	Genetic research	Taxonomic research	Life history
	Limiting factor research	Epidemiology	Trade

14A. Is Population and Habitat Viability Assessment recommended? (Yes)

Notes:

15. Management recommendations for the taxon *Specify:*

Habitat management	Wild pop management	Monitoring	Translocation
Sustainable utilization	Public education	Genome Resource Banking	
Limiting factor mgt.	Captive breeding	Work in local communities	

Notes:

16. Captive management recommendations *If captive breeding recommended in Q15, is it for:*

Species recovery	Education	Reintroduction	Benign introduction
Research	Husbandry	Sustainable use	Preservation of live genome

Notes/other:

17. Do Captive stocks already exist? (Yes)

17A. Names of facilities: BCEAW, Sharjah, UAE

17B. No. in captivity:

Males	Females:	Unsexed:	Total	Not known
0	0	9	9	

17C. Does a coordinated species management program exist for this species? (Yes)

If yes, specify

17D. Is a coordinated Species Management Program recommended for range country(ies)? (Yes)

Carasobarbus apoensis **None**

If yes, specify

18. Level of captive breeding/cultivation recommended

Ongoing ex situ program intensified or increased

:

19. Are techniques established to propagate the taxon?

Techniques known for this taxon or similar taxon

20. Other Comments*countries:*

Part Four

21. Sources:

Banister, K.E. & Clarke, M.A. 1977. The freshwater fishes of the Arabian peninsula. Journal of Oman Studies. Special Report: The Scientific Results of the Oman Flora and Fauna Survey 1975: 111-154

Krupp, F. 1983. Freshwater fishes of Saudi Arabia and adjacent regions of the Arabian peninsula.-Fauna of Saudi Arabia 5: 568-636. Basle & Jeddah.

22. Compilers:

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Mohammed Mahmoud AL Marzouqi
Naser Mohammed Obaid

23. Reviews:

Conservation Assessment Management Plan
Taxon Data Sheet

Carasobarbus exulatus **None**

1.Scientific *Carasobarbus exulatus* (Banister and Clarke, 1977)

1A. Synonyms: Scientific synonym / ambiguities — Authority (date)

Barbus exulatus — Banister & Clarke, 1977

1B. Scientific nomenclature:

FAMILY: Cyprinidae
ORDER: Cypriniformes
CLASS: Actinopterygii

1C. Common Names: None

1D.Taxonomic level: Species

Notes:

2. Distribution of the Taxon **Country(ies) Primary(yes)**

2A.Life form (plant): Yemen

2B. Habitat:

2C. Niche: Wadi

2D. Historical distrib: Yemen

2E. Current countries: Yemen

2F. Geograph. extent: Wadi Hadramaut, Wadi Maran

2G Migration regions:

3. Approximate Area of Occurrence of the taxon in and around the area of study/ sighting/ collection

(Extent of occurrence is defined as the area contained within the shortest continuous imaginary boundary encompassing all known, inferred or projected sites of present occurrence of the taxon)

Occurrence area: 101-5,000 sq km

Notes (Occurrence)

4. Approximate Area of Occupancy of the taxon in and around the area of study/ collection

(Area of occupancy is defined as the area occupied by the taxon within the 'extent of occurrence')

Area of Occupancy: < 10 sq km

Notes (Occupancy):

5. No. of Locations or Subpopulations in which the taxon is distributed: 2

Is there a continuous declined in subpopulations / locations?

Are there extreme fluctuations in subpopulations/ locations?

Percentage of population that lives in most important subarea:

Notes (subpops)

6. Habitat status: Fragmented

6A. Is there any change in the habitat where the taxon occurs? (Yes)

If yes, describe: Unknown

6B. If decreasing, what has been the decrease in Habitat area?

Carasobarbus exulatus **None**

approximate change (%): over how many years:
Notes on decrease:

6C. If stable or unknown, do you predict a decline in habitat?
approximate change (%): 21% to 50% over how many years: 5

6D. State primary cause of change: Pumping of water

If yes, Describe: Unknown

6F. State primary cause of change:

Notes: Group predicted >20% decrease in population over 5 years

7. Threats

	Rank	Present	Future	Lead to decline	Notes on future threats
3. Indirect Effects					
3.9 Other					
3.9 Other					Lowering of water supply/level

8. Trade:

8A. Is the taxon in trade? (Yes) Type of trade:: Local Commercial
8B. Parts in Trade: Domestic International

8C. Which form of trade (specified form) is resulting in a perceived or inferred population decline?

9-10. Population numbers and

9A. Avg. age of parents in pop: Years

	Total Pop.	Mature	
9B. Global Population:	Unknown		
10A. Recent past trends:	Unknown	Unknown	Specify: declining, stable, or increasing

Rate of decline (past) For what period (years)

10B. Will population decline?
. Predicted Rate (future) <10% For what period (years) 5

11. Population Data quality

11A. Estimates base on: Census or monitoring, Field study, Informal sightings, Indirect information, Museum records, Literature, Hearsay/belief

Notes:

11B. Qualifiers: *Observed, Inferred, Suspected, Estimated, or Projected*

11C. Uncertainty *95% confidence, Minimum/Maximum values, Range of Opinion; Evidentiary; Precautionary; Subjective; Hypothetical; Point estimate; or Range estimate*

12. Recent Field Studies

Researcher names, Location, Dates, Topics:
None

Part Two

13. Status

	(previous):	
13A. IUCN Red List categ;- Global:	None	National:
13I. IUCN Red List Categ (Current)	Endangered	13J. Criteria basis: B1a,b; B2a,b

Carasobarbus exulatus **None**

13B. Cites:
13C. Natl wildlife Legislation:
13D. Natl Red Data Book:
13E. Intl Red Data Book:
13F. Other legislation:
13G. Protected area presence:
13H. Endorsed protection plan:
Notes:

Part Three

14. Supporting Research Is research recommended for taxon? (Yes)

Specify:	Genetic research	Taxonomic research	Life history
Survey studies	Limiting factor research	Epidemiology	Trade

14A. Is Population and Habitat Viability Assessment recommended? (Yes)

Notes:

15. Management recommendations for the taxon *Specify:*

Habitat management	Wild pop management	Monitoring	Translocation
Sustainable utilization	Public education	Genome Resource Banking	
Limiting factor mgt.	Captive breeding	Work in local communities	

Notes:

16. Captive management recommendations *If captive breeding recommended in Q15, is it for:*

Species recovery	Education	Reintroduction	Benign introduction
Research	Husbandry	Sustainable use	Preservation of live genome

Notes/other:

17. Do Captive stocks already exist? (Yes)

17A. Names of facilities:

17B. No. in captivity:

Males	Females:	Unsexed:	Total	Not known
0	0	0	0	

17C. Does a coordinated species management program exist for this species? (Yes)

If yes, specify

17D. Is a coordinated Species Management Program recommended for range country(ies)? (Yes)

If yes, specify Yemen

18. Level of captive breeding/cultivation recommended

Initiate ex situ Program within 3 years

19. Are techniques established to propagate the taxon?

Some techniques known for taxon or similar taxon

20. Other Comments Recently referred to Carasobarbus

Part Four

21. Sources: Banister, K.E. & Clarke, M.A. 1977. The freshwater fishes of the Arabian peninsula. Journal of Oman Studies. Special Report: The Scientific Results of the Oman Flora and Fauna Survey 1975: 111-154

Carasobarbus exulatus **None**

Krupp, F. 1983. Freshwater fishes of Saudi Arabia and adjacent regions of the Arabian peninsula.- Fauna of Saudi Arabia 5: 568-636. Basle & Jeddah.

22. Compilers:

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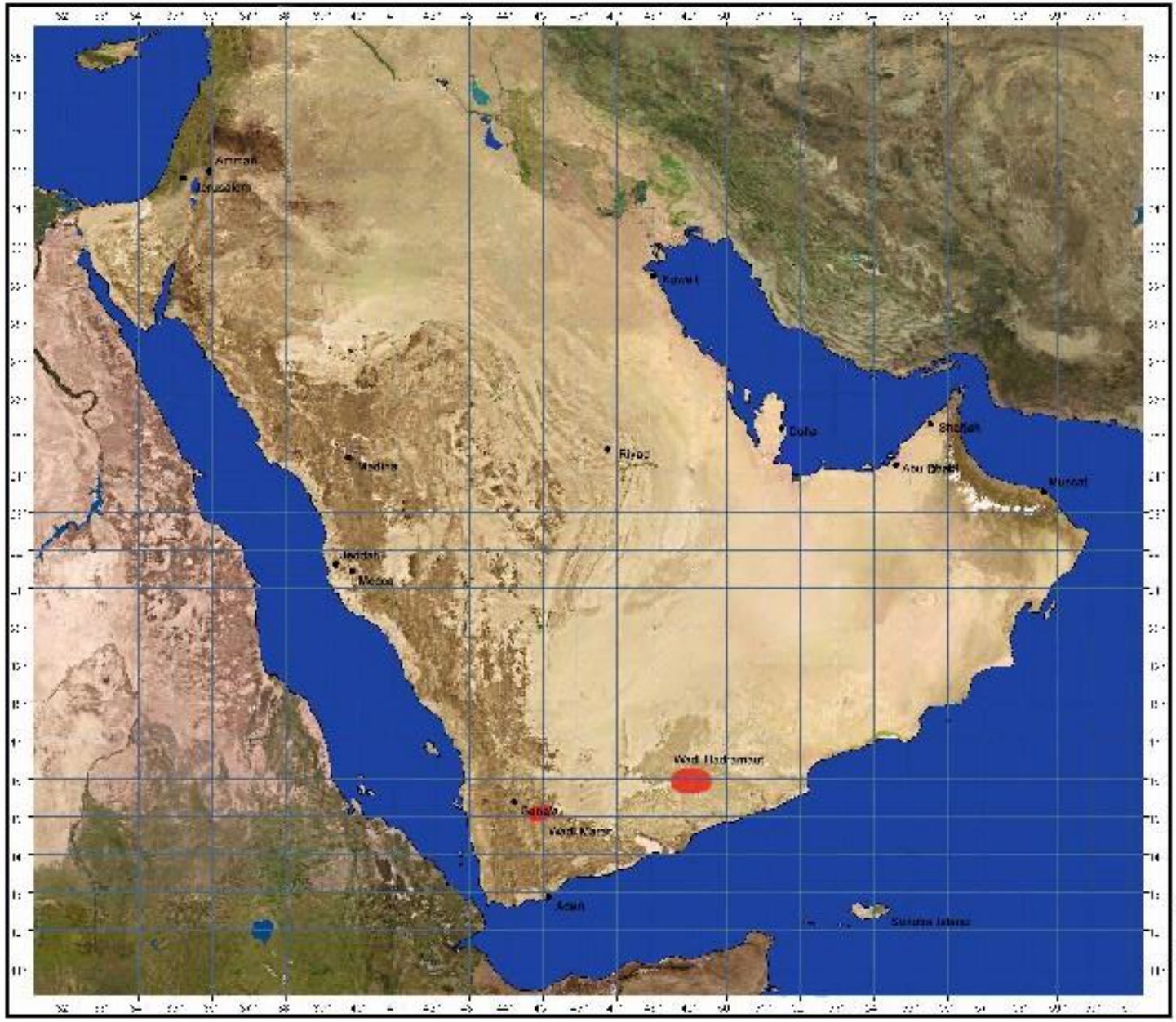
23. Reviews:



Carasobarbus exulatus

0 100 200 300 400 500 Kilometers

Conservation Assessment Management Plan
Taxon Data Sheet

1.Scientific *Cyprinion acinaces* Banister and Clarke, 1977

1A. Synonyms: Scientific synonym / ambiguities | Authority (date)

None

1B. Scientific nomenclature:

FAMILY: Cyprinidae
ORDER: Cypriniformes
CLASS: Actinopterygii

1C. Common Names: None

1D.Taxonomic level: Species

Notes:

2. Distribution of the Taxon **Country (ies)** **Primary (yes)**

2A.Life form (plant):

Yemen
Saudi Arabia

2B. Habitat:

2C. Niche: Habitat specificity: Freshwater wadi, wide range

2D. Historical distrib: Yemen, Saudi Arabia

2E. Current countries: Yemen, Saudi Arabia

2F. Geographic. extent: Yemen: Wadi Hadramaut, Hamdam; Saudi Arabia: Hijaz

2G Migration regions:

3. Approximate Area of Occurrence of the taxon in and around the area of study/ sighting/ collection

(Extent of occurrence is defined as the area contained within the shortest continuous imaginary boundary encompassing all known, inferred or projected sites of present occurrence of the taxon)

Occurrence area: > 20,000 sq km

Notes (Occurrence)

4. Approximate Area of Occupancy of the taxon in and around the area of study/ collection

(Area of occupancy is defined as the area occupied by the taxon within the 'extent of occurrence')

Area of Occupancy: 11-500 sq km

Notes (Occupancy):

5. No. of Locations or Subpopulations in which the taxon is distributed: 4

Is there a continuous declined in subpopulations / locations?

Are there extreme fluctuations in subpopulations/ locations?

Percentage of population that lives in most important sub area:

Notes (sub pops) More than 4 subpopulations possible

6. Habitat status: Fragmented

6A. Is there any change in the habitat where the taxon occurs? (Yes)

If yes, describe: Unknown

6B. If decreasing, what has been the decrease in Habitat area?

Cyprinion acinaces **None**

approximate change (%): < 20% over how many years: 5
Notes on decrease:

6C. If stable or unknown, do you predict a decline in habitat?
approximate change (%): over how many years:

6D. State primary cause of change:

6E. Is there any change in the quality of the habitat where the taxon occurs? (Yes)
If yes, Describe: Unknown

6F. State primary cause of change:

Notes:

7. Threats

	Rank	Present	Future	Lead to decline	Notes on future threats
3. Indirect Effects					
3.9 Other					
3.9 Other					Pumping of water

8. Trade:

8A. Is the taxon in trade? (Yes) Type of trade:: Local Commercial
8B. Parts in Trade: Domestic International

8C. Which form of trade (specified form) is resulting in a perceived or inferred population decline?

9-10. Population numbers and

9A. Avg. age of parents in pop: Years

	Total Pop.	Mature
9B. Global Population:	unknown	

10A. Recent past trends: Unknown Specify: declining, stable, or increasing

Rate of decline (past) For what period (years)

10B. Will population decline?

. Predicted Rate (future) <10% For what period (years) 5

11. Population Data quality

11A. Estimates base on: Census or monitoring, Field study, Informal sightings, Indirect information, Museum records, Literature, Hearsay/belief

Notes:

11B. Qualifiers: *Observed, Inferred, Suspected, Estimated, or Projected*

11C. Uncertainty *95% confidence, Minimum/Maximum values, Range of Opinion; Evidentiary; Precautionary; Subjective; Hypothetical; Point estimate; or Range estimate*

12. Recent Field Studies

Researcher names, Location, Dates, Topics:

Part Two

13. Status

(previous):

13A. IUCN Red List categ; - Global: None National:

13I. IUCN Red List Categ (Current) Least Concern 13J. Criteria basis:

13B. Cites: 13C. Natl wildlife Legislation:

Cyprinion acinaces **None**

13D. Natl Red Data Book: 13E. Intl Red Data Book:

13F. Other legislation:

13G. Protected area presence:

13H. Endorsed protection plan:

Notes:

Part Three

14. Supporting Research Is research recommended for taxon? (Yes)

Specify:	Genetic research	Taxonomic research	Life history
Survey studies	Limiting factor research	Epidemiology	Trade

14A. Is Population and Habitat Viability Assessment recommended? (Yes)

Notes:

15. Management recommendations for the taxon *Specify:*

Habitat management	Wild pop management	Monitoring	Translocation
Sustainable utilization	Public education	Genome Resource Banking	
Limiting factor mgt.	Captive breeding	Work in local communities	

Notes:

16. Captive management recommendations *If captive breeding recommended in Q15, is it for:*

Species recovery	Education	Reintroduction	Benign introduction
Research	Husbandry	Sustainable use	Preservation of live genome

Notes/other:

17. Do Captive stocks already exist? (Yes)

17A. Names of facilities:

17B. No. in captivity:

Males	Females:	Unsexed:	Total	Not known
0	0	0	0	

17C. Does a coordinated species management program exist for this species? (Yes)

If yes, specify

17D. Is a coordinated Species Management Program recommended for range country (ies)? (Yes)

If yes, specify

18. Level of captive breeding/cultivation recommended

No ex situ program recommended

19. Are techniques established to propagate the taxon?

20. Other Comments

Part Four

21. Sources:

Banister, K.E. & Clarke, M.A. 1977. The freshwater fishes of the Arabian Peninsula. Journal of Oman Studies. Special Report: The Scientific Results of the Oman Flora and Fauna Survey 1975: 111-154

Krupp, F. 1983. Freshwater fishes of Saudi Arabia and adjacent regions of the Arabian peninsula.-Fauna of Saudi Arabia 5: 568-636. Basle & Jeddah

Cyprinion acinaces **None**

22. Compilers: Damien Egan
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Essa Faraj
Hatem AL-Yami
Moawia Ahmed Hag Osman
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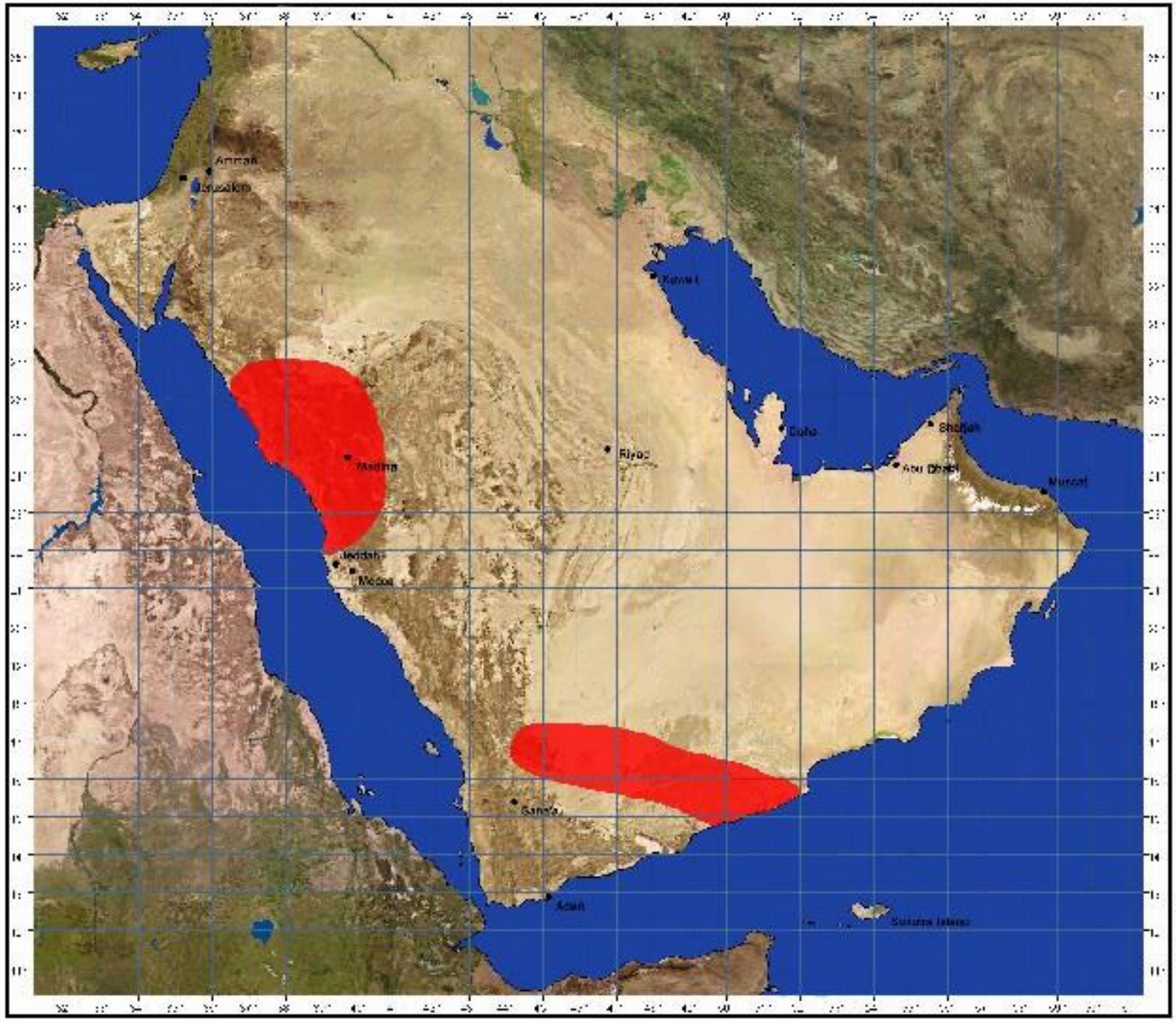
23. Reviews:



Cyprinion acinaces

0 100 200 300 400 500 Kilometers

Conservation Assessment Management Plan
Taxon Data Sheet

Cyprinion mhalensis **none**

1.Scientific *Cyprinion mhalensis* Alkahem & Behnke, 1983

1A. Synonyms: Scientific synonym / ambiguities Authority (date)

1B. Scientific nomenclature:

FAMILY: Cyprinidae
ORDER: Cypriniformes
CLASS: Actinopterygii

1C. Common Names: None

1D.Taxonomic level: Species

Notes:

2. Distribution of the Taxon

2A.Life form (plant):

2B. Habitat:

2C. Niche: Habitat specificity: Wadi; upper reaches of the wadis

2D. Historical distrib: Saudi Arabia

2E. Current countries: Saudi Arabia

2F. Geograph. extent: South Western Saudi Arabia internal drainage

2G Migration regions:

3. Approximate Area of Occurrence of the taxon in and around the area of study/ sighting/ collection

(Extent of occurrence is defined as the area contained within the shortest continuous imaginary boundary encompassing all known, inferred or projected sites of present occurrence of the taxon)

Occurrence area: > 20,000 sq km

Notes (Occurrence)

4. Approximate Area of Occupancy of the taxon in and around the area of study/ collection

(Area of occupancy is defined as the area occupied by the taxon within the 'extent of occurrence')

Area of Occupancy: 11-500 sq km

Notes (Occupancy):

5. No. of Locations or Subpopulations in which the taxon is distributed: 5

Is there a continuous declined in subpopulations / locations?

Are there extreme fluctuations in subpopulations/ locations?

Percentage of population that lives in most important subarea:

Notes (subpops)

6. Habitat status: Fragmented

6A. Is there any change in the habitat where the taxon occurs? (Yes)

If yes, describe: Decrease in Area

6B. If decreasing, what has been the decrease in Habitat area?

Cyprinion mhalensis **none**

approximate change (%): 21% to 50% over how many years: 5
Notes on decrease:

6C. If stable or unknown, do you predict a decline in habitat?
approximate change (%): over how many years:

6D. State primary cause of change: Pumping of water for domestic use

6E. Is there any change in the quality of the habitat where the taxon occurs? (Yes)
If yes, Describe: Unknown

6F. State primary cause of change:

Notes:

7. Threats

	Rank	Present	Future	Lead to decline	Notes on future threats
1. Habitat Loss (Human Induced)					
1.3. Development					
1.3.6 Dams					
3. Indirect Effects					
3.3. Ecological imbalance					
3.3.5 Habitat loss					Pumping of water
4. Natural disasters					
4.2 Drought					
4.2 Drought					

8. Trade:

8A. Is the taxon in trade? (Yes) Type of trade:: Local Commercial
8B. Parts in Trade: Domestic International

8C. Which form of trade (specified form) is resulting in a perceived or inferred population decline?

9-10. Population numbers and

9A. Avg. age of parents in pop: Years

	Total Pop.	Mature
9B. Global Population:	> 10,000	> 10,000

10A. Recent past trends: Declining Specify: declining, stable, or increasing

Rate of decline (past) <10% For what period (years) 5

10B. Will population decline?

. Predicted Rate (future) For what period (years)

11. Population Data quality

11A. Estimates base on: Census or monitoring Field study Informal sightings
Indirect information Museum records Literature
Hearsay/belief

Notes:

11B. Qualifiers: *Observed, Inferred, Suspected, Estimated, or Projected*

11C. Uncertainty *95% confidence, Minimum/Maximum values, Range of Opinion; Evidentiary; Precautionary; Subjective; Hypothetical; Point estimate; or Range estimate*

12. Recent Field Studies

Researcher names, Location, Dates, Topics:

Cyprinion mhalensis **none**

Part Two

13. Status

(previous):

13A. IUCN Red List categ;- Global: none National:

13I. IUCN Red List Categ (Current) Least Concern 13J. Criteria basis:

13B. Cites: 13C. Natl wildlife Legislation:

13D. Natl Red Data Book: 13E. Intl Red Data Book:

13F. Other legislation:

13G. Protected area presence:

13H. Endorsed protection plan:

Notes:

Part Three

14. Supporting Research

Is research recommended for taxon? (Yes)

Specify:

Survey studies	Genetic research	Taxonomic research	Life history
	Limiting factor research	Epidemiology	Trade

14A. Is Population and Habitat Viability Assessment recommended? (Yes)

Notes:

15. Management recommendations for the taxon

Specify:

Habitat management	Wild pop management	Monitoring	Translocation
Sustainable utilization	Public education	Genome Resource Banking	
Limiting factor mgt.	Captive breeding	Work in local communities	

Notes:

16. Captive management recommendations

If captive breeding recommended in Q15, is it for:

Species recovery	Education	Reintroduction	Benign introduction
Research	Husbandry	Sustainable use	Preservation of live genome

Notes/other:

17. Do Captive stocks already exist? (Yes)

17A. Names of facilities: BCEAW

17B. No. in captivity:

Males	Females:	Unsexed:	Total	Not known
		6	6	

17C. Does a coordinated species management program exist for this species? (Yes)

If yes, specify

17D. Is a coordinated Species Management Program recomended for range country(ies)? (Yes)

If yes, specify

18. Level of captive breeding/cultivation recommended

Ongoing ex situ program intensified or increased

19. Are techniques extablished to propagate the taxon?

Techniques known for this taxon or similar taxon

Cyprinion mhalensis **none**

20. Other Comments Level of captive management: keep breeding at present level

Part Four

21. Sources: Alkahem, A.F. and Behnke, R.J. 1983. Freshwater fishes of Saudi Arabia.- Fauna of Saudi Arabia 5: 545-567. Basle & Jeddah.

Krupp, F. 1983. Freshwater fishes of Saudi Arabia and adjacent regions of the Arabian peninsula.- Fauna of Saudi Arabia 5: 568-636. Basle & Jeddah.

22. Compilers: Damien Egan
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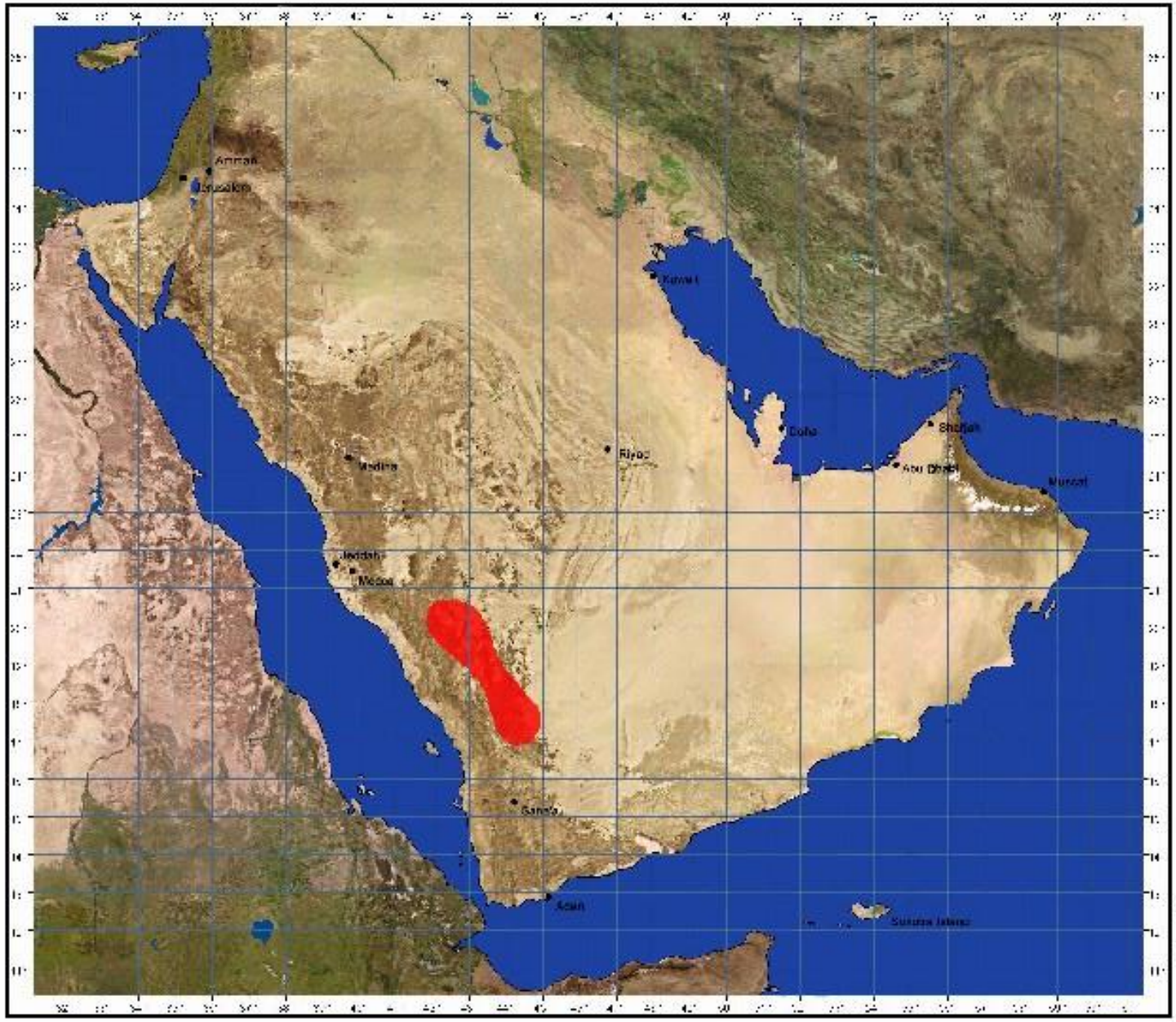
23. Reviews:



Cyprinion mhalensis

0 100 200 300 400 500 Kilometers

Conservation Assessment Management Plan
Taxon Data Sheet

Threatened Fauna of Arabia's Mountain Habitat 11 February 2002

Cyprinion microphthalmum muscatensis Page 1 **None**

1.Scientific *Cyprinion microphthalmum muscatensis* (Boulenger, 1887)

1A. Synonyms: Scientific synonym / ambiguities Authority (date)

Scaphiodon muscatensis Boulenger, 1887

1B. Scientific nomenclature:

FAMILY: Cyprinidae
ORDER: Cypriniformes
CLASS: Actinopterygii

1C. CommonNames: None

1D.Taxonomic level: Subspecies

Notes:

2. Distribution of the Taxon **Country(ies)**

Primary(yes)

2A.Life form (plant): Oman
United Arab Emirates

2B. Habitat:

2C. Niche: Habitat specificity: perenial wadis, wide range of habitats.

2D. Historical distrib: Oman, UAE

2E. Current countries: Oman, UAE

2F. Geograph. extent: Northeastern Oman, Southeastern UAE

2G Migration regions:

3. Approximate Area of Occurrence of the taxon in and around the area of study/ sighting/ collection

(Extent of occurrence is defined as the area contained within the shortest continuous imaginary boundary encompassing all known, inferred or projected sites of present occurrence of the taxon)

Occurrence area: 5,001 - 20,000 sq km

Notes (Occurrence)

4. Approximate Area of Occupancy of the taxon in and around the area of study/ collection

(Area of occupancy is defined as the area occupied by the taxon within the 'extent of occurrence')

Area of Occupancy: 11-500 sq km

Notes (Occupancy):

5. No. of Locations or Subpopulations in which the taxon is distributed: 30

Is there a continuous declined in subpopulations / locations?

Are there extreme fluctuations in subpopulations/ locations?

Percentage of population that lives in most important subarea:

Notes (subpops)

6. Habitat status: Fragmented

6A. Is there any change in the habitat where the taxon occurs? (Yes)

If yes, describe:

6B. If decreasing, what has been the decrease in Habitat area?

approximate change (%): over how many years:

Cyprinion microphthalmum muscatensis **None**

Notes on decrease:

6C. If stable or unknown, do you predict a decline in habitat?
approximate change (%): < 20% over how many years: 5

6E. Is there any change in the quality of the habitat where the taxon occurs? (Yes)
If yes, Describe:

6F. State primary cause of change:

Notes: Due to insecticides for malaria control

7. Threats

	Rank	Present	Future	Lead to decline	Notes on future threats
1. Habitat Loss (Human Induced)					
1.3. Development					
1.3.6 Dams					
2. Direct Loss/Exploitation					
2.3. Accidental mortality					
2.3.5 Poisoning					
3. Indirect Effects					
3.3. Ecological imbalance					
3.3.5. Habitat loss due to exotic plants					
4. Natural disasters					
4.2 Drought					
4.2 Drought					
6. Pollution					
6.1 Chemical					
6.1 Pesticides/chemical pollution					

8. Trade:

8A. Is the taxon in trade? (Yes) Type of trade:: Local Commercial

8B. Parts in Trade: Domestic International

8C. Which form of trade (specified form) is resulting in a perceived or inferred population decline?

9-10. Population numbers and

9A. Avg. age of parents in pop: Years

	Total Pop.	Mature	
9B. Global Population:	> 10,000	> 10,000	
10A. Recent past trends:	Declining	Declining	Specify: declining, stable, or increasing
Rate of decline (past)	<10%		For what period (years)
10B. Will population decline?			
. Predicted Rate (future)			For what period (years)

11. Population Data quality

11A. Estimates base on: Census or monitoring Field study Informal sightings
Indirect information Museum records Literature
Hearsay/belief

Notes:

11B. Qualifiers: *Observed, Inferred, Suspected, Estimated, or Projected*

Cyprinion microphthalmum muscatensis None

11C. Uncertainty — *95% confidence, Minimum/Maximum values, Range of Opinion; Evidentiary; Precautionary; Subjective; Hypothetical; Point estimate; or Range estimate*

12. Recent Field Studies

Researcher names, Location, Dates, Topics:

Part Two

13. Status

(previous):

13A. IUCN Red List categ;- Global: None National:

13I. IUCN Red List Categ (Current) Least Concern 13J. Criteria basis:

13B. Cites: 13C. Natl wildlife Legislation:

13D. Natl Red Data Book: 13E. Intl Red Data Book:

13F. Other legislation:

13G. Protected area presence:

13H. Endorsed protection plan:

Notes:

Part Three

14. Supporting Research Is research recommended for taxon? (Yes)

Specify:	Genetic research	Taxonomic research	Life history
Survey studies	Limiting factor research	Epidemiology	Trade

14A. Is Population and Habitat Viability Assessment recommended? (Yes)

Notes:

15. Management recommendations for the taxon *Specify:*

Habitat management	Wild pop management	Monitoring	Translocation
Sustainable utilization	Public education	Genome Resource Banking	
Limiting factor mgt.	Captive breeding	Work in local communities	

Notes:

16. Captive management recommendations *If captive breeding recommended in Q15, is it for:*

Species recovery	Education	Reintroduction	Benign introduction
Research	Husbandry	Sustainable use	Preservation of live genome

Notes/other:

17. Do Captive stocks already exist? (Yes)

17A. Names of facilities: Breeding Centre for Endangered Arabian Wildlife, Sharjah, UAE; Dubai Pest Control Fund, Dubai, UAE

17B. No. in captivity:

Males	Females:	Unsexed:	Total	Not known
0	0	0	200	

17C. Does a coordinated species management program exist for this species? (Yes)

If yes, specify

Cyprinion microphthalmum muscatensis **None**

17D. Is a coordinated Species Management Program recomended for range country(ies)? (Yes)

If yes, specify

18. Level of captive breeding/cultivation recommended

Ongoing ex situ program intensified or increased :

19. Are techniques established to propagate the taxon?

Techniques known for similar taxon *countries:*

20. Other Comments

Part Four

21. Sources:

Banister, K.E. & Clarke, M.A. 1977. The freshwater fishes of the Arabian peninsula. Journal of Oman Studies. Special Report: The Scientific Results of the Oman Flora and Fauna Survey 1975: 111-154

Feulner, G.R. 1998. Wadi fish of the UAE. Tribulus 8(2): 16-21.

Krupp, F. 1983. Freshwater fishes of Saudi Arabia and adjacent regions of the Arabian peninsula.-Fauna of Saudi Arabia 5: 568-636. Basle & Jeddah.

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23. Reviews:

Cyprinion microphthalmum muscatensis

0 100 200 300 400 500 Kilometers

Conservation Assessment Management Plan
Taxon Data Sheet

1.Scientific *Garra barreimiae* Fowler and Steinitz, 1956

1A. Synonyms: Scientific synonym / ambiguities Authority (date)

1B. Scientific nomenclature:
FAMILY: Cyprinidae
ORDER: Cypriniformes
CLASS: Actinopterygii

1C. Common Names: garra English

1D.Taxonomic level: Species

Notes:

2. Distribution of the Taxon **Country (ies)** **Primary (yes)**

2A.Life form (plant): Oman
United Arab Emirates

2B. Habitat:

2C. Niche: Habitat specificity: Perennial wadi in running water

2D. Historical distrib: Oman, UAE

2E. Current countries: Oman, UAE

2F. Geographic. extent: Eastern UAE, eastern Oman

2G Migration regions:

3. Approximate Area of Occurrence of the taxon in and around the area of study/ sighting/ collection

(Extent of occurrence is defined as the area contained within the shortest continuous imaginary boundary encompassing all known, inferred or projected sites of present occurrence of the taxon)

Occurrence area: 5,001 - 20,000 sq km

Notes (Occurrence)

4. Approximate Area of Occupancy of the taxon in and around the area of study/ collection

(Area of occupancy is defined as the area occupied by the taxon within the 'extent of occurrence')

Area of Occupancy: 11-500 sq km

Notes (Occupancy):

5. No. of Locations or Subpopulations in which the taxon is distributed: 50

Is there a continuous declined in subpopulations / locations?

Are there extreme fluctuations in subpopulations/ locations?

Percentage of population that lives in most important sub area:

Notes (sub pops)

6. Habitat status: Fragmented

6A. Is there any change in the habitat where the taxon occurs? (Yes)
If yes, describe:

6B. If decreasing, what has been the decrease in Habitat area?
approximate change (%): over how many years:
Notes on decrease:

Garra barreimiae **garra**

6C. If stable or unknown, do you predict a decline in habitat?

6D. State primary cause of change:
6E. Is there any change in the quality of the habitat where the taxon occurs? (Yes)
If yes, Describe:
6F. State primary cause of change:
Notes:

7. Threats

	Rank	Present	Future	Lead to decline	Notes on future threats
6. Pollution					
6.1 Chemical					
6.1 Pesticides/chemical pollution					

8. Trade:

8A. Is the taxon in trade? (Yes) Type of trade: Local Commercial
8B. Parts in Trade: Domestic International
8C. Which form of trade (specified form) is resulting in a perceived or inferred population decline?

9-10. Population numbers and

9A. Avg. age of parents in pop: 3 Years

	Total Pop.	Mature	
9B. Global Population:	> 10,000	> 10,000	
10A. Recent past trends:	Stable	Stable	Specify: declining, stable, or increasing
Rate of decline (past)			For what period (years)
10B. Will population decline?			
. Predicted Rate (future)			For what period (years)

11. Population Data quality

11A. Estimates base on: Census or monitoring, Indirect information, Field study, Museum records, Informal sightings, Literature, Hearsay/belief
Notes:

11B. Qualifiers: *Observed, Inferred, Suspected, Estimated, or Projected*

11C. Uncertainty *95% confidence, Minimum/Maximum values, Range of Opinion; Evidentiary; Precautionary; Subjective; Hypothetical; Point estimate; or Range estimate*

12. Recent Field Studies

Researcher names, Location, Dates, Topics:

Part Two
13. Status

(previous):
13A. IUCN Red List categ;- Global: National:
13I. IUCN Red List Categ (Current) Least Concern 13J. Criteria basis:
13B. Cites: 13C. Natl wildlife Legislation:

Garra barreimiae **garra**

13D. Natl Red Data Book: 13E. Intl Red Data Book:

13F. Other legislation:

13G. Protected area presence:

13H. Endorsed protection plan:

Notes:

Part Three

14. Supporting Research Is research recommended for taxon? (Yes)

Specify:	Genetic research	Taxonomic research	Life history
Survey studies	Limiting factor research	Epidemiology	Trade

14A. Is Population and Habitat Viability Assessment recommended? (Yes)

Notes:

15. Management recommendations for the taxon *Specify:*

Habitat management	Wild pop management	Monitoring	Translocation
Sustainable utilization	Public education	Genome Resource Banking	
Limiting factor mgt.	Captive breeding	Work in local communities	

Notes:

16. Captive management recommendations *If captive breeding recommended in Q15, is it for:*

Species recovery	Education	Reintroduction	Benign introduction
Research	Husbandry	Sustainable use	Preservation of live genome

Notes/other:

17. Do Captive stocks already exist? (Yes)

17A. Names of facilities: BCEAW, Sharjah, UAE

17B. No. in captivity:

Males	Females:	Unsexed:	Total	Not known
0	0	1000	1000	

17C. Does a coordinated species management program exist for this species? (Yes)

If yes, specify

17D. Is a coordinated Species Management Program recommended for range country (ies)? (Yes)

If yes, specify

18. Level of captive breeding/cultivation recommended

19. Are techniques established to propagate the taxon?

Techniques known for this taxon or similar taxon

20. Other Comments

Part Four

21. Sources:

Banister, K.E. & Clarke, M.A. 1977. The freshwater fishes of the Arabian Peninsula. Journal of Oman Studies. Special Report: The Scientific Results of the Oman Flora and Fauna Survey 1975: 111-154.

Feulner, G.R. 1998. Wadi fish of the UAE. Tribulus 8(2): 16-21.

Krupp, F. 1983. Freshwater fishes of Saudi Arabia and adjacent regions of the Arabian Peninsula. -Fauna of Saudi Arabia 5: 568-636. Basle & Jeddah.

Krupp, F. 1989. Freshwater fishes of the Wadi Batha drainage.- Journal of Oman Studies. Special Report no. 3: 401-404. Muscat.

22. Compilers: Damien Egan
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Fareed Krupp

23. Reviews:

Garra barreimiae

0 100 200 300 400 500 Kilometers

Conservation Assessment Management Plan
Taxon Data Sheet

1.Scientific *Garra barreimiae* Fowler and Steinitz, 1956

1A. Synonyms: Scientific synonym / ambiguities Authority (date)
Blind Population

1B. Scientific nomenclature:
FAMILY: Cyprinidae
ORDER: Cypriniformes
CLASS: Actinopterygii

1C. Common Names: blind cave fish English
Omani blind fish English

1D.Taxonomic level: Form

Notes: This assessment is for a specific population of this species known from a single cave in Oman.

2. Distribution of the Taxon **Country (ies)** **Primary (yes)**

2A.Life form (plant): Oman

2B. Habitat:

2C. Niche: Habitat specificity: Subterranean fresh water spring, occasionally access wadi during periods of high water.

2D. Historical distrib: Oman, Hoti Cave near Al Hamra

2E. Current countries: Oman, Hoti Cave near Al Hamra

2F. Geographic. extent: Oman, Hoti Cave near Al Hamra

2G Migration regions:

3. Approximate Area of Occurrence of the taxon in and around the area of study/ sighting/ collection
(Extent of occurrence is defined as the area contained within the shortest continuous imaginary boundary encompassing all known, inferred or projected sites of present occurrence of the taxon)

Occurrence area: < 100 sq km

Notes (Occurrence)

4. Approximate Area of Occupancy of the taxon in and around the area of study/ collection
(Area of occupancy is defined as the area occupied by the taxon within the 'extent of occurrence')

Area of Occupancy: < 10 sq km

Notes (Occupancy):

5. No. of Locations or Subpopulations in which the taxon is distributed: 1

Is there a continuous declined in subpopulations / locations?

Are there extreme fluctuations in subpopulations/ locations?

Percentage of population that lives in most important sub area:

Notes (sub pops)

6. Habitat status: Continuous

6A. Is there any change in the habitat where the taxon occurs? (Yes)

Garra barreimiae **Omani blind fish**

6B. If decreasing, what has been the decrease in Habitat area?
If yes, describe: approximate change (%): over how many years:
Notes on decrease:
6C. If stable or unknown, do you predict a decline in habitat?
approximate change (%): over how many years:
6D. State primary cause of change:
6E. Is there any change in the quality of the habitat where the taxon occurs? (Yes)
If yes, Describe:
6F. State primary cause of change:
Notes:

7. Threats

	Rank	Present	Future	Lead to decline	Notes on future threats

8. Trade:

8A. Is the taxon in trade? (Yes) Type of trade:: Local Commercial
8B. Parts in Trade: Domestic International
8C. Which form of trade (specified form) is resulting in a perceived or inferred population decline?

9-10. Population numbers and

9A. Avg. age of parents in pop: Years

	Total Pop.	Mature
9B. Global Population:	< 10,000	

10A. Recent past trends: Stable Specify: declining, stable, or increasing
Rate of decline (past) For what period (years)
10B. Will population decline?
. Predicted Rate (future) For what period (years)

11. Population Data quality

11A. Estimates base on: Census or monitoring Field study Informal sightings
Indirect information Museum records Literature
Notes: Hearsay/belief

11B. Qualifiers: *Observed, Inferred, Suspected, Estimated, or Projected*

11C. Uncertainty *95% confidence, Minimum/Maximum values, Range of Opinion; Evidentiary; Precautionary; Subjective; Hypothetical; Point estimate; or Range estimate*

12. Recent Field Studies

Researcher names, Location, Dates, Topics:

Part Two

13. Status

(previous):
13A. IUCN Red List categ;- Global: Vulnerable National:
13I. IUCN Red List Categ (Current) Critically endangered 13J. Criteria basis: B2a
13B. Cites: 13C. Natl wildlife Legislation:

Garra barreimiae **Omani blind fish**

13D. Natl Red Data Book: 13E. Intl Red Data Book:

13F. Other legislation:

13G. Protected area presence:

13H. Endorsed protection plan:

Notes:

Part Three

14. Supporting Research Is research recommended for taxon? (Yes)

Specify:	Genetic research	Taxonomic research	Life history
Survey studies	Limiting factor research	Epidemiology	Trade

14A. Is Population and Habitat Viability Assessment recommended? (Yes)

Notes:

15. Management recommendations for the taxon *Specify:*

Habitat management	Wild pop management	Monitoring	Translocation
Sustainable utilization	Public education	Genome Resource Banking	
Limiting factor mgt.	Captive breeding	Work in local communities	

Notes:

16. Captive management recommendations *If captive breeding recommended in Q15, is it for:*

Species recovery	Education	Reintroduction	Benign introduction
Research	Husbandry	Sustainable use	Preservation of live genome

Notes/other:

17. Do Captive stocks already exist? (Yes)

17A. Names of facilities: Chester Zoo, U.K.; BCEAW, Sharjah, UAE; National Zoo, South Africa; Hamburg University, Germany
Less than 1000 total.

17B. No. in captivity:

Males	Females:	Unsexed:	Total	Not known
0	0	1000	1000	

17C. Does a coordinated species management program exist for this species? (Yes)

If yes, specify

17D. Is a coordinated Species Management Program recommended for range country (ies)? (Yes)

If yes, specify

18. Level of captive breeding/cultivation recommended

Ongoing ex situ program intensified or increased

19. Are techniques established to propagate the taxon?

Techniques known for this taxon or similar taxon

20. Other Comments

Part Four

21. Sources:

Banister, K.E. 1984. A subterranean population of Garra barreimiae (Teleostei: Cyprinidae) from Oman, with comments on the concept of regressive evolution. Journal of Natural History 18: 927-938

Banister, K.E., Bell, J. & Crumpler, M. 1992. Omani blind cave fish. Aquarist and Pond Keeper (1992): 38-40.

22. Compilers: Damien Egan
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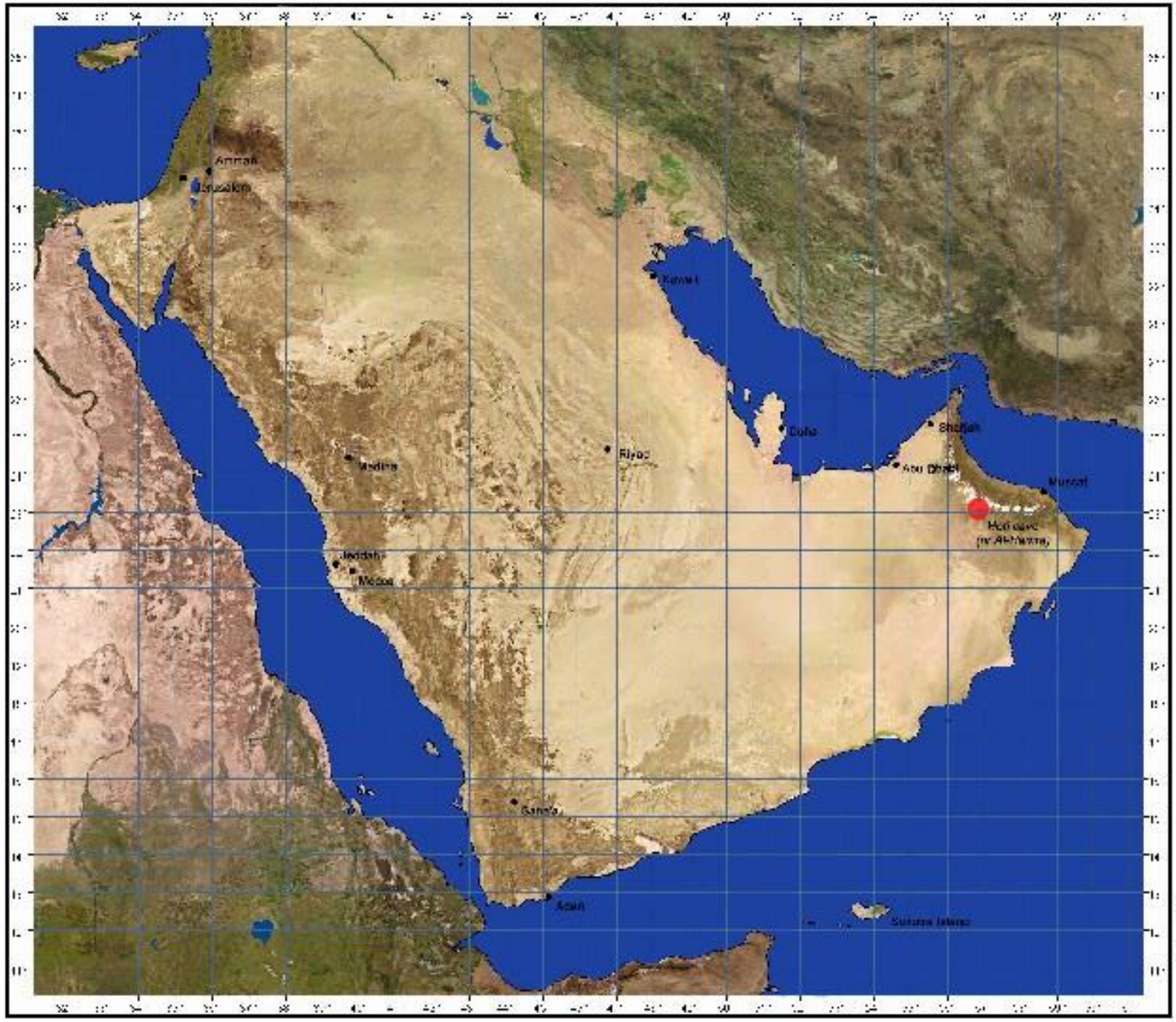
Moawia Ahmed Hag Osman
Nashat A. Hamidan
Fareed Krupp
John Balfour
Majid Makky Taher

23. Reviews:



Garra barreimiae
(blind population)

0 100 200 300 400 500 Kilometers

Conservation Assessment Management Plan
Taxon Data Sheet

Garra buettikeri **None**

1.Scientific *Garra buettikeri* Krupp, 1983

1A. Synonyms: Scientific synonym / ambiguities Authority (date)

1B. Scientific nomenclature:

FAMILY: Cyprinidae
ORDER: Cypriniformes
CLASS: Actinopterygii

1C. CommonNames: None

1D.Taxonomic level: Species

Notes:

2. Distribution of the Taxon **Country(ies)**
Primary(yes)

2A.Life form (plant): Saudi Arabia

2B. Habitat:

2C. Niche: Habitat specificity: Wadi, upper reaches.

2D. Historical distrib:

2E. Current countries: Saudi Arabia

2F. Geograph. extent: Saudi Arabia

2G Migration regions: Southwestern Saudi Arabia

3. Approximate Area of Occurrence of the taxon in and around the area of study/ sighting/ collection

(Extent of occurrence is defined as the area contained within the shortest continuous imaginary boundary encompassing all known, inferred or projected sites of present occurrence of the taxon)

Occurrence area: > 20,000 sq km

Notes (Occurrence)

4. Approximate Area of Occupancy of the taxon in and around the area of study/ collection

(Area of occupancy is defined as the area occupied by the taxon within the 'extent of occurrence')

Area of Occupancy: 11-500 sq km

Notes (Occupancy):

5. No. of Locations or Subpopulations in which the taxon is distributed: 6

Is there a continuous declined in subpopulations / locations?

Are there extreme fluctuations in subpopulations/ locations?

Percentage of population that lives in most important subarea:

Notes (subpops)

6. Habitat status: Fragmented

6A. Is there any change in the habitat where the taxon occurs? (Yes)

If yes, describe: Decrease in Area

6B. If decreasing, what has been the decrease in Habitat area?

Garra buettikeri **None**

approximate change (%): 21% to 50% over how many years: 5
Notes on decrease:

6C. If stable or unknown, do you predict a decline in habitat?
approximate change (%): over how many years:

6D. State primary cause of change: Pumping of water

6E. Is there any change in the quality of the habitat where the taxon occurs? (Yes)
If yes, Describe:

6F. State primary cause of change:

Notes:

7. Threats

	Rank	Present	Future	Lead to decline	Notes on future threats
1. Habitat Loss (Human Induced)					
1.3. Development					
1.3.6 Dams					
3. Indirect Effects					
3.3. Ecological imbalance					
3.3.5 Habitat loss					
3.9 Other					
3.9 Other					Pumping of water
4. Natural disasters					
4.2 Drought					
4.2 Drought					

8. Trade:

8A. Is the taxon in trade? (Yes) Type of trade:: Local Commercial
8B. Parts in Trade: Domestic International

8C. Which form of trade (specified form) is resulting in a perceived or inferred population decline?

9-10. Population numbers and

9A. Avg. age of parents in pop: 2 Years

	Total Pop.	Mature	
9B. Global Population:	> 10,000	> 10,000	
10A. Recent past trends:	Declining	Declining	Specify: declining, stable, or increasing
Rate of decline (past)			For what period (years)
10B. Will population decline?			
. Predicted Rate (future)			For what period (years)

11. Population Data quality

11A. Estimates base on: Census or monitoring, Indirect information, Field study, Museum records, Informal sightings, Literature, Hearsay/belief

Notes:

11B. Qualifiers: *Observed, Infeerred, Suspected, Estimated, or Projected*

11C. Uncertainty *95% confidence, Minimum/Maximum values, Range of Opinion; Evidentiary; Precautionary; Subjective; Hypothetical; Point estimate; or Range estimate*

12. Recent Field Studies

Garra buettikeri **None**

Researcher names, Location, Dates, Topics:

Part Two

13. Status

(previous):

13A. IUCN Red List categ;- Global: National:

13I. IUCN Red List Categ (Current) Least Concern 13J. Criteria basis:

13B. Cites: 13C. Natl wildlife Legislation:

13D. Natl Red Data Book: 13E. Intl Red Data Book:

13F. Other legislation:

13G. Protected area presence:

13H. Endorsed protection plan:

Notes:

Part Three

14. Supporting Research Is research recommended for taxon? (Yes)

Specify:	Genetic research	Taxonomic research	Life history
Survey studies	Limiting factor research	Epidemiology	Trade

14A. Is Population and Habitat Viability Assessment recommended? (Yes)

Notes:

15. Management recommendations for the taxon *Specify:*

Habitat management	Wild pop management	Monitoring	Translocation
Sustainable utilization	Public education	Genome Resource Banking	
Limiting factor mgt.	Captive breeding	Work in local communities	

Notes:

16. Captive management recommendations *If captive breeding recommended in Q15, is it for:*

Species recovery	Education	Reintroduction	Benign introduction
Research	Husbandry	Sustainable use	Preservation of live genome

Notes/other:

17. Do Captive stocks already exist? (Yes)

17A. Names of facilities: Breeding Centre for Endangered Arabian Wildlife, Sharjah, UAE

17B. No. in captivity:

Males	Females:	Unsexed:	Total	Not known
0	0	15	15	

17C. Does a coordinated species management program exist for this species? (Yes)

If yes, specify

17D. Is a coordinated Species Management Program recomended for range country(ies)? (Yes)

If yes, specify

18. Level of captive breeding/cultivation recommended

Ongoing ex situ program intensified or increased

19. Are techniques extablished to propagate the taxon?

Garra buettikeri **None**

Techniques known for this taxon or similar taxon

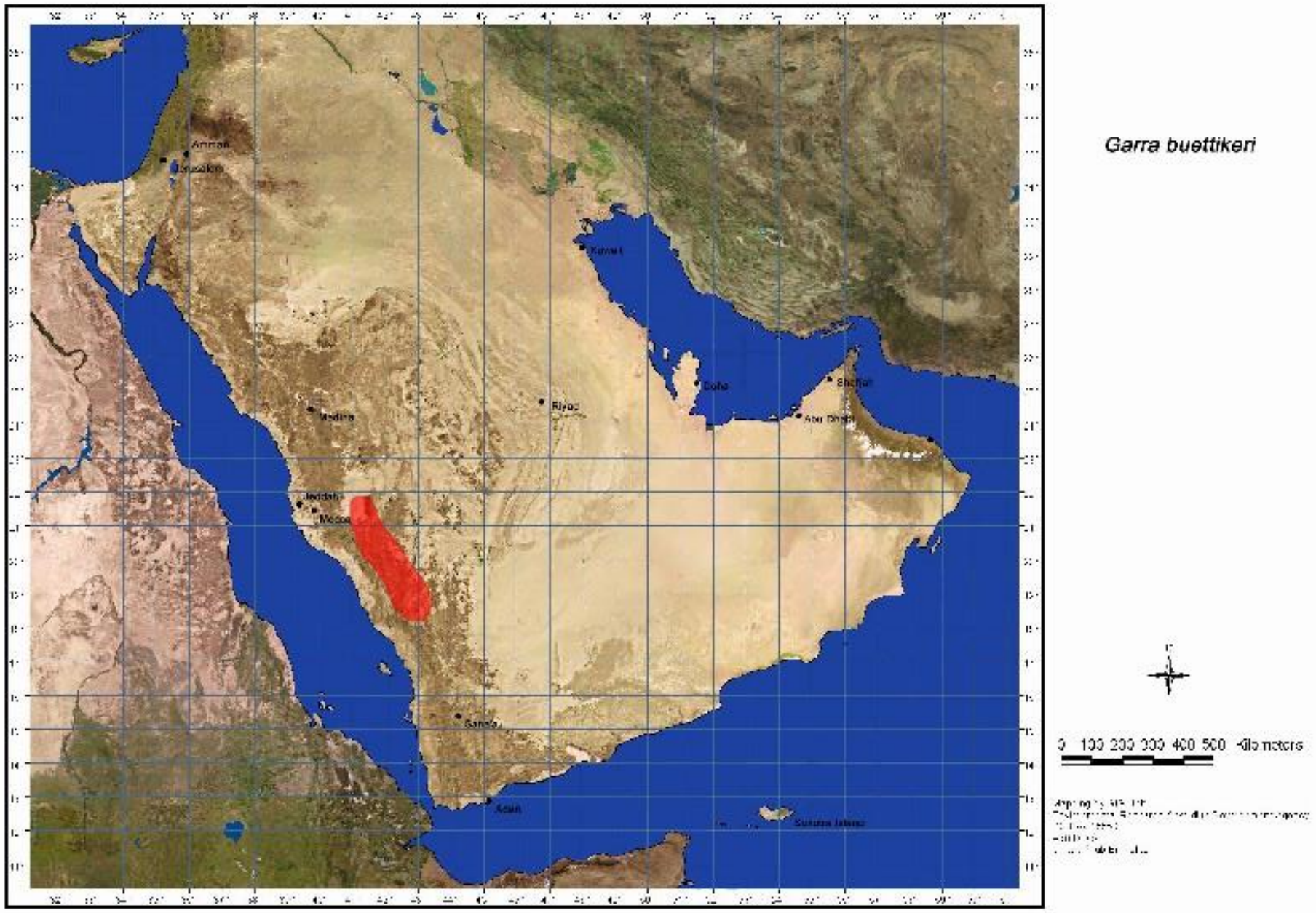
20. Other Comments

Part Four

21. Sources: Krupp, F. 1983. Freshwater fishes of Saudi Arabia and adjacent regions of the Arabian peninsula.- Fauna of Saudi Arabia 5: 568-636. Basle & Jeddah.

22. Compilers:
Damien Egan
Kais Yamour Mansoor
Pritpal Soorae
Gary Feulner
Catherine Tsagarakis
Essa Faraj
Hatem AL-Yami
Moawia Ahmed Hag Osman
Nashat A. Hamidan
Fareed Krupp
John Balfour
Majid Makky Taher
Nasser Sultan AL-Muraikhi
Mohammed Mahmoud AL Marzouqi
Naser Mohammed Obaid

23. Reviews:


Garra buettikeri
Amman
Jerusalem
Kuwait
Doha
Riyadh
Medina
Jeddah
Mecca
Sanaa
Aden
0 100 200 300 400 500 Kilometers

Conservation Assessment Management Plan
Taxon Data Sheet

1.Scientific *Garra dunsirei* Banister, 1987

1A. Synonyms: Scientific synonym / ambiguities | Authority (date)

None

1B. Scientific nomenclature:

FAMILY: Cyprinidae
ORDER: Cypriniformes
CLASS: Actinopterygii

1C. Common Names: None

1D.Taxonomic level: Species

Notes:

2. Distribution of the Taxon **Country (ies)** **Primary (yes)**

2A.Life form (plant): Oman

2B. Habitat:

2C. Niche: Habitat specificity: Pool in sinkhole, 200m deep

2D. Historical distrib: Oman

2E. Current countries: Oman

2F. Geographic. extent: Oman: Dhofar: Jabal Qara

2G Migration regions:

3. Approximate Area of Occurrence of the taxon in and around the area of study/ sighting/ collection

(Extent of occurrence is defined as the area contained within the shortest continuous imaginary boundary encompassing all known, inferred or projected sites of present occurrence of the taxon)

Occurrence area: < 100 sq km

Notes (Occurrence)

4. Approximate Area of Occupancy of the taxon in and around the area of study/ collection

(Area of occupancy is defined as the area occupied by the taxon within the 'extent of occurrence')

Area of Occupancy: < 10 sq km

Notes (Occupancy):

5. No. of Locations or Subpopulations in which the taxon is distributed: 1

Is there a continuous declined in subpopulations / locations?

Are there extreme fluctuations in subpopulations/ locations?

Percentage of population that lives in most important sub area:

Notes (sub pops)

6. Habitat status: Continuous

6A. Is there any change in the habitat where the taxon occurs? (Yes)

If yes, describe:

6B. If decreasing, what has been the decrease in Habitat area?

approximate change (%): over how many years:

Notes on decrease:

Garra dunsirei **None**

6C. If stable or unknown, do you predict a decline in habitat?

6D. State primary cause of change:
6E. Is there any change in the quality of the habitat where the taxon occurs? (Yes)
If yes, Describe:
6F. State primary cause of change:
Notes:

7. Threats

	Rank	Present	Future	Lead to decline	Notes on future threats

8. Trade:

8A. Is the taxon in trade? (Yes) Type of trade: Local Commercial
8B. Parts in Trade: Domestic International
8C. Which form of trade (specified form) is resulting in a perceived or inferred population decline?

9-10. Population numbers and

9A. Avg. age of parents in pop: Years

	Total Pop.	Mature
9B. Global Population:	unknown	< 250

10A. Recent past trends: Specify: declining, stable, or increasing
Rate of decline (past) For what period (years)
10B. Will population decline?
. Predicted Rate (future) For what period (years)

11. Population Data quality

11A. Estimates base on: Census or monitoring, Indirect information, Field study, Museum records, Informal sightings, Literature, Hearsay/belief
Notes:

11B. Qualifiers: *Observed, Inferred, Suspected, Estimated, or Projected*

11C. Uncertainty *95% confidence, Minimum/Maximum values, Range of Opinion; Evidentiary; Precautionary; Subjective; Hypothetical; Point estimate; or Range estimate*

12. Recent Field Studies

Researcher names, Location, Dates, Topics:
None

Part Two

13. Status

	(previous):	
13A. IUCN Red List categ;- Global:	Vulnerable	National:
13I. IUCN Red List Categ (Current)	Endangered	13J. Criteria basis: D

13B. Cites: 13C. Natl wildlife Legislation:
13D. Natl Red Data Book: 13E. Intl Red Data Book:
13F. Other legislation:
13G. Protected area presence:

Garra dunsirei **None**

13H. Endorsed protection plan:

Notes:

Part Three

14. Supporting Research Is research recommended for taxon? (Yes)

Specify:	Genetic research	Taxonomic research	Life history
Survey studies	Limiting factor research	Epidemiology	Trade

14A. Is Population and Habitat Viability Assessment recommended? (Yes)

Notes:

15. Management recommendations for the taxon *Specify:*

Habitat management	Wild pop management	Monitoring	Translocation
Sustainable utilization	Public education	Genome Resource Banking	
Limiting factor mgt.	Captive breeding	Work in local communities	

Notes:

16. Captive management recommendations *If captive breeding recommended in Q15, is it for:*

Species recovery	Education	Reintroduction	Benign introduction
Research	Husbandry	Sustainable use	Preservation of live genome

Notes/other:

17. Do Captive stocks already exist? (Yes)

17A. Names of facilities:

17B. No. in captivity:

Males	Females:	Unsexed:	Total	Not known
0	0	0	0	

17C. Does a coordinated species management program exist for this species? (Yes)

If yes, specify

17D. Is a coordinated Species Management Program recommended for range country (ies)? (Yes)

If yes, specify

18. Level of captive breeding/cultivation recommended

Initiate ex situ Program within 3 years

19. Are techniques established to propagate the taxon?

Techniques known for this taxon or similar taxon

20. Other Comments Species occurs in very isolated locality

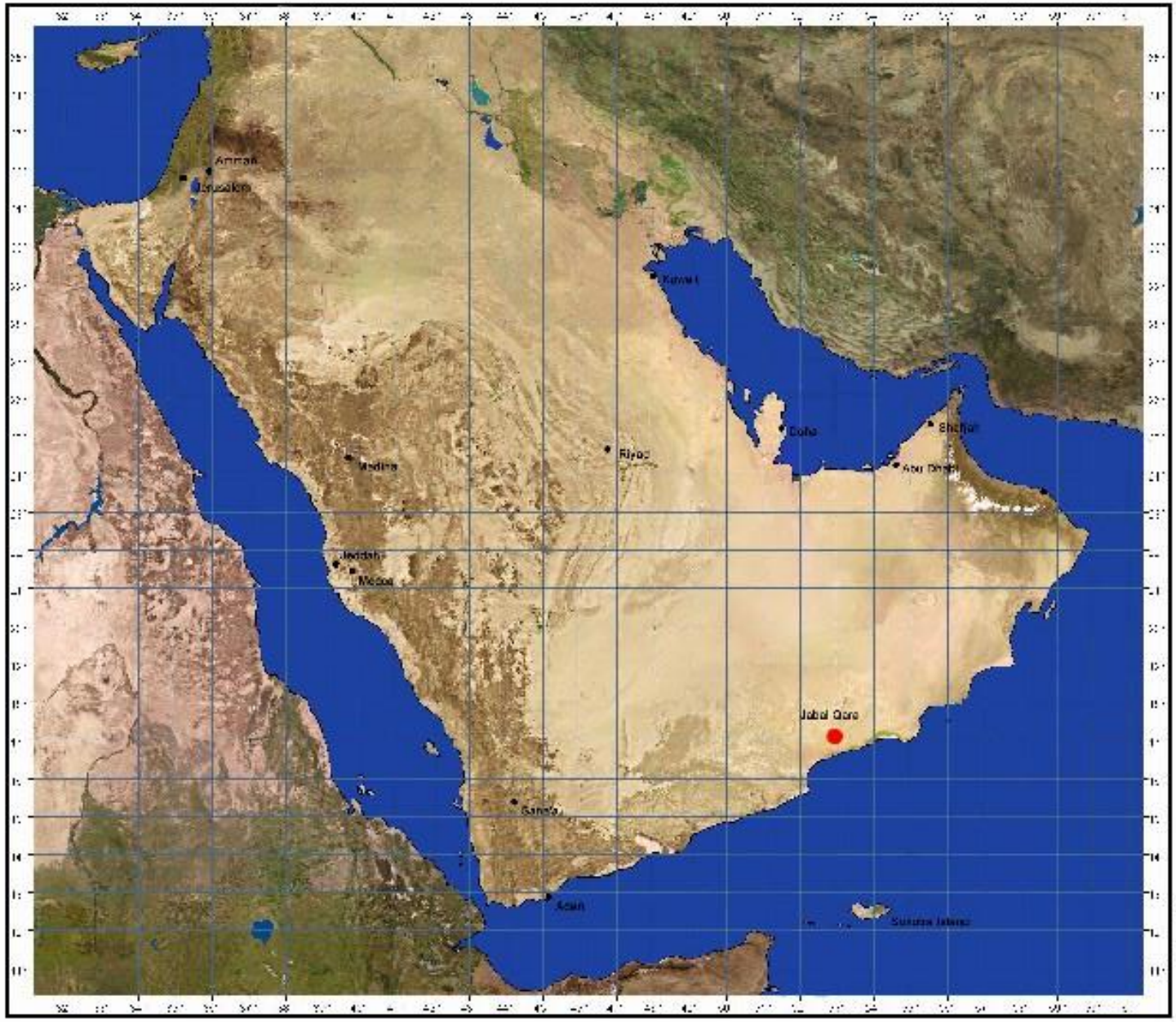
Part Four

21. Sources: Baniser, K.E. 1987. Two new species of Garra (Teleostei - Cyprinidae) from the Arabian Peninsula. Bulletin of the British Museum (Natural History) 52(1): 59 - 70.

22. Compilers: Damien Egan
Kais Yamour Mansoor
Pritpal Soorae
Gary Feulner
Catherine Tsagarakis
Essa Faraj
Hatem AL-Yami
Moawia Ahmed Hag Osman

Garra dunsirei **None**

23. Reviews:	Nashat A. Hamidan Fareed Krupp John Balfour Majid Makky Taher Nasser Sultan AL-Muraikhi Mohammed Mahmoud AL Marzouqi



Garra dunsirei

0 100 200 300 400 500 Kilometers

Conservation Assessment Management Plan
Taxon Data Sheet

Garra ghorensis **None**

1.Scientific *Garra ghorensis* Krupp, 1982

1A. Synonyms: Scientific synonym / ambiguities — Authority (date)

Garra tibanica ghorensis Krupp, 1982

1B. Scientific nomenclature:

FAMILY: Cyprinidae
ORDER: Cypriniformes
CLASS: Actinopterygii

1C. Common Names: None

1D.Taxonomic level: Species

Notes:

2. Distribution of the Taxon **Country (ies)** **Primary (yes)**

2A.Life form (plant): Jordan

2B. Habitat:

2C. Niche: Habitat specificity: Spring and wadis, Dead Sea Valley, Level of the Dead Sea, 300m below sea level.

2D. Historical distrib: 1) Ain Al-Haditha 2) Wadi Al-Hasa 3) West of the Dead Sea in Palestine

2E. Current countries: Probably only in Ain Al-Haditha, Jordan (August 2001)

2F. Geographic. extent: Probably only in Ain Al-Haditha

2G Migration regions:

3. Approximate Area of Occurrence of the taxon in and around the area of study/ sighting/ collection

(Extent of occurrence is defined as the area contained within the shortest continuous imaginary boundary encompassing all known, inferred or projected sites of present occurrence of the taxon)

Occurrence area: < 100 sq km

Notes (Occurrence)

4. Approximate Area of Occupancy of the taxon in and around the area of study/ collection

(Area of occupancy is defined as the area occupied by the taxon within the 'extent of occurrence')

Area of Occupancy: < 10 sq km

Notes (Occupancy):

5. No. of Locations or Subpopulations in which the taxon is distributed: 1

Is there a continuous declined in subpopulations / locations?

Are there extreme fluctuations in subpopulations/ locations?

Percentage of population that lives in most important sub area:

Notes (sub pops)

6. Habitat status: Not known

6A. Is there any change in the habitat where the taxon occurs? (Yes)

If yes, describe: Decrease in Area

Garra ghorensis **None**

approximate change (%): >80% over how many years: 1-2 years
Notes on decrease:

6B. If decreasing, what has been the decrease in Habitat area? 6C. If stable or unknown, do you predict a decline in habitat?

approximate change (%): over how many years:

6D. State primary cause of change: Pumping of Water, Pollution, Concrete Canal

6E. Is there any change in the quality of the habitat where the taxon occurs? (Yes)

If yes, Describe: Decrease in quality

6F. State primary cause of change:

Notes:

7. Threats

	Rank	Present	Future	Lead to decline	Notes on future threats
1. Habitat Loss (Human Induced)					
1.3. Development					
1.3.6 Dams					
1.4. Unspecified causes					
1.4.1 Fragmentation					
3. Indirect Effects					
3.2. Alien invasive species					
3.2.5 Habitat loss					
4. Natural disasters					
4.2 Drought					
4.2 Drought					
6. Pollution					
6.1 Chemical					
6.1 Pesticides/chemical pollution					
6.2 Industrial					
6.2 Industrial pollution					

8. Trade:

8A. Is the taxon in trade? (Yes) Type of trade: Local Commercial
8B. Parts in Trade: Domestic International

8C. Which form of trade (specified form) is resulting in a perceived or inferred population decline?

9-10. Population numbers and

9A. Avg. age of parents in pop: 2 Years

	Total Pop.	Mature	
9B. Global Population:	1000		
10A. Recent past trends:	Declining		Specify: declining, stable, or increasing
Rate of decline (past)	80% or more		For what period (years) 2
10B. Will population decline?			
. Predicted Rate (future)			For what period (years)

11. Population Data quality

11A. Estimates base on: Census or monitoring, Field study, Informal sightings, Indirect information, Museum records, Literature, Hearsay/belief

Notes:

Garra ghorensis **None**

11B. Qualifiers: *Observed, Inferred, Suspected, Estimated, or Projected*

12. Recent Field Studies

Researcher names, Location, Dates, Topics:

Part Two

13. Status

	(previous):		
13A. IUCN Red List categ;- Global:	None	National:	
13I. IUCN Red List Categ (Current)	Critically endangered	13J. Criteria basis:	A(i), B1a, b(i); B2a,b (February, 2000)

13B. Cites: 13C. Natl wildlife Legislation:

13D. Natl Red Data Book: 13E. Intl Red Data Book:

13F. Other legislation:

13G. Protected area presence:

13H. Endorsed protection plan:

Notes:

Part Three

14. Supporting Research Is research recommended for taxon? (Yes)

Specify:			
Survey studies	Genetic research	Taxonomic research	Life history
	Limiting factor research	Epidemiology	Trade

14A. Is Population and Habitat Viability Assessment recommended? (Yes)

Notes:

15. Management recommendations for the taxon *Specify:*

Habitat management	Wild pop management	Monitoring	Translocation
Sustainable utilization	Public education	Genome Resource Banking	
Limiting factor mgt.	Captive breeding	Work in local communities	

Notes:

16. Captive management recommendations *If captive breeding recommended in Q15, is it for:*

Species recovery	Education	Reintroduction	Benign introduction
Research	Husbandry	Sustainable use	Preservation of live genome

Notes/other:

17. Do Captive stocks already exist? (Yes)

17A. Names of facilities:

17B. No. in captivity:

Males	Females:	Unsexed:	Total	Not known
0	0	0	0	

Garra ghorensis **None**

17C. Does a coordinated species management program exist for this species? (Yes)

If yes, specify

17D. Is a coordinated Species Management Program recommended for range country (ies)? :(Yes)

If yes, specify Jordan

18. Level of captive breeding/cultivation recommended

Initiate ex situ Program within 3 years

19. Are techniques established to propagate the taxon?

Techniques known for this taxon or similar taxon

20. Other Comments Urgent need for initiation of ex situ Program within 3 years. This species may Already have disappeared. Immediate action required!

Part Four

21. Sources:

Krupp, F. 1982. Garra tibanica ghorensis subsp. nov. (Pisces: Cyprinidae), an African element in the cyprinid fauna of the Levant.-Hydrobiologia 88: 319-324. Den Haag.

Krupp, F.1983. Freshwater fishes of Saudi Arabia and adjacent regions of the Arabian Peninsula.- Fauna of Saudi Arabia 5: 568-636. Basle & Jeddah.

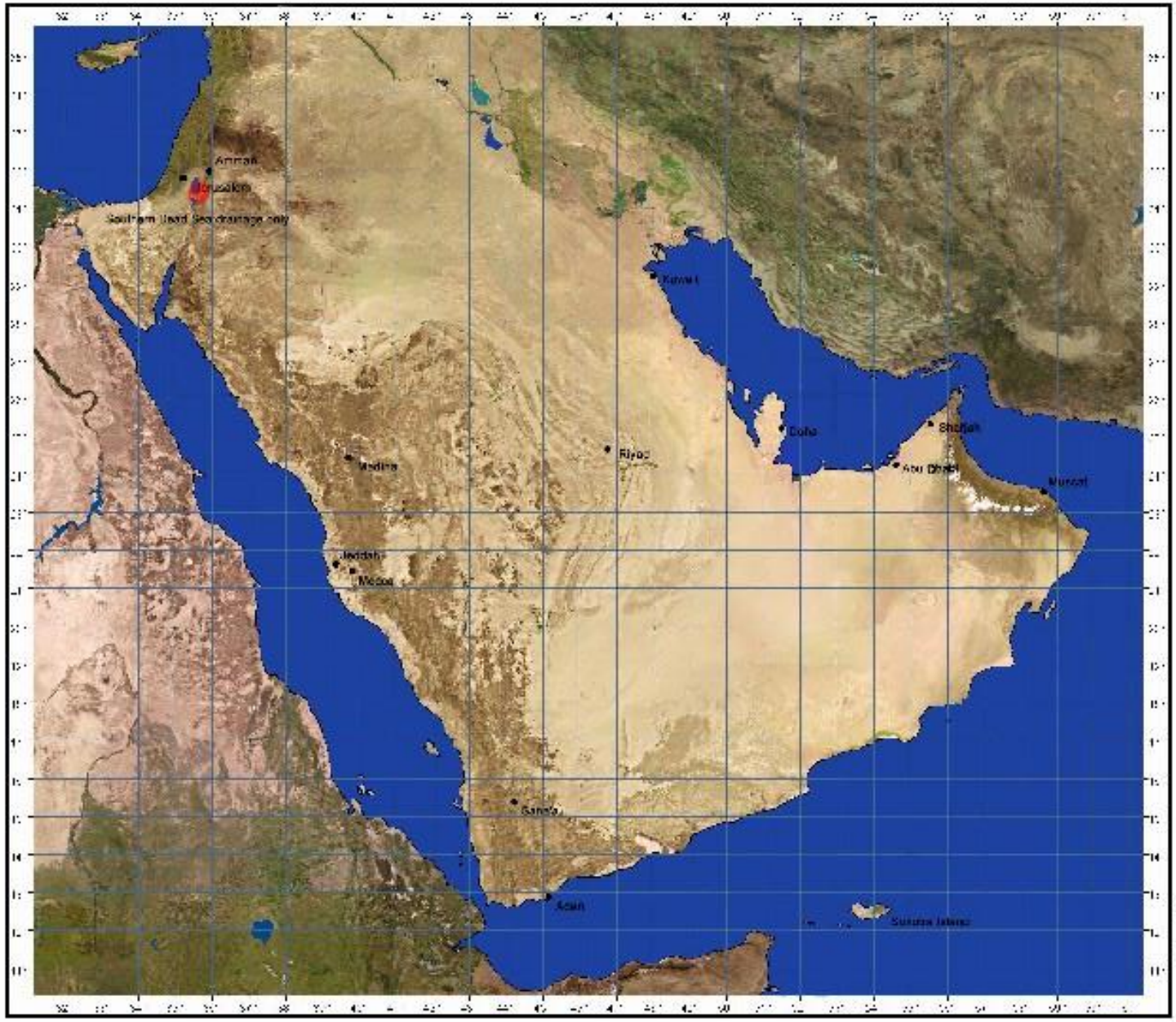
Krupp, F. & Schneider, W. 1989. The fishes of the Jordan River drainage basin and Ezra Oasis.- Fauna of Saudi Arabia 10: 347-416. Basle & Riyadh.

22. Compilers: Damien Egan, Kais Yamour Mansoor, Pritpal Soorae, Gary Feulner, Catherine Tsagarakis,

Essa Faraj, Hatem Al-Yami, Moawia Ahmed Hag Osman, Nashat A. Hamidan, Fareed Krupp,

John Balfour, Majid Makki Taher, Nasser Sultan Al-Muraikhi, Mohammed Mahmoud Al Marzouqi, Nasser Mohammed Obaid

23. Reviews:



Garra ghorensis

Conservation Assessment Management Plan
Taxon Data Sheet

1.Scientific *Garra lautior* Banister, 1987

1A. Synonyms: Scientific synonym / ambiguities Authority (date)

None

1B. Scientific nomenclature:

FAMILY: Cyprinidae
ORDER: Cypriniformes
CLASS: Actinopterygii

1C. Common Names: None

1D.Taxonomic level: Species

Notes:

2. Distribution of the Taxon **Country (ies)** **Primary (yes)**

2A.Life form (plant): Yemen

2B. Habitat:

2C. Niche: Habitat specificity: Wadi, niche unknown

2D. Historical distrib: Yemen

2E. Current countries: Yemen

2F. Geographic. extent: Wadi Hadramaut, Hadramaut Province

2G Migration regions:

3. Approximate Area of Occurrence of the taxon in and around the area of study/ sighting/ collection

(Extent of occurrence is defined as the area contained within the shortest continuous imaginary boundary encompassing all known, inferred or projected sites of present occurrence of the taxon)

Occurrence area: 5,001 - 20,000 sq km

Notes (Occurrence)

4. Approximate Area of Occupancy of the taxon in and around the area of study/ collection

(Area of occupancy is defined as the area occupied by the taxon within the 'extent of occurrence')

Area of Occupancy: < 10 sq km

Notes (Occupancy):

5. No. of Locations or Subpopulations in which the taxon is distributed: 1

Is there a continuous declined in subpopulations / locations?

Are there extreme fluctuations in subpopulations/ locations?

Percentage of population that lives in most important sub area:

Notes (sub pops)

6. Habitat status: Continuous

6A. Is there any change in the habitat where the taxon occurs? (Yes)

If yes, describe: Unknown

6B. If decreasing, what has been the decrease in Habitat area?

Garra lautior **None**

approximate change (%): over how many years:
Notes on decrease:

6C. If stable or unknown, do you predict a decline in habitat?
approximate change (%): < 20% over how many years: 5

6D. State primary cause of change: Pumping of water

6E. Is there any change in the quality of the habitat where the taxon occurs? (Yes)
If yes, Describe: Unknown

6F. State primary cause of change:
Notes:

7. Threats

	Rank	Present	Future	Lead to decline	Notes on future threats
3. Indirect Effects					
3.3. Ecological imbalance					
3.3.5 Habitat loss					loss of habitat because of pumping of water

8. Trade:

8A. Is the taxon in trade? (Yes) Type of trade: Local Commercial
8B. Parts in Trade: Domestic International

8C. Which form of trade (specified form) is resulting in a perceived or inferred population decline?

9-10. Population numbers and

9A. Avg. age of parents in pop: Years

	Total Pop.	Mature
9B. Global Population:	unknown	

10A. Recent past trends: Unknown Specify: declining, stable, or increasing
Rate of decline (past) For what period (years)
10B. Will population decline?
. Predicted Rate (future) <10% For what period (years) 5

11. Population Data quality

11A. Estimates base on: Census or monitoring, Indirect information, Field study, Museum records, Informal sightings, Literature, Hearsay/belief
Notes:

11B. Qualifiers: *Observed, Inferred, Suspected, Estimated, or Projected*

11C. Uncertainty *95% confidence, Minimum/Maximum values, Range of Opinion; Evidentiary; Precautionary; Subjective; Hypothetical; Point estimate; or Range estimate*

12. Recent Field Studies

Researcher names, Location, Dates, Topics:
None

Part Two

13. Status

(previous):
13A. IUCN Red List categ;- Global: None National:
13I. IUCN Red List Categ (Current) Vulnerable 13J. Criteria basis: B1a,b; B2a,b

Garra lautior **None**

13B. Cites:
13C. Natl wildlife Legislation:
13D. Natl Red Data Book:
13E. Intl Red Data Book:
13F. Other legislation:
13G. Protected area presence:
13H. Endorsed protection plan:
Notes:

Part Three

14. Supporting Research Is research recommended for taxon? (Yes)

Specify:	Genetic research	Taxonomic research	Life history
Survey studies	Limiting factor research	Epidemiology	Trade

14A. Is Population and Habitat Viability Assessment recommended? (Yes)

Notes:

15. Management recommendations for the taxon *Specify:*

Habitat management	Wild pop management	Monitoring	Translocation
Sustainable utilization	Public education	Genome Resource Banking	
Limiting factor mgt.	Captive breeding	Work in local communities	

Notes:

16. Captive management recommendations *If captive breeding recommended in Q15, is it for:*

Species recovery	Education	Reintroduction	Benign introduction
Research	Husbandry	Sustainable use	Preservation of live genome

Notes/other:

17. Do Captive stocks already exist? (Yes)

17A. Names of facilities:

17B. No. in captivity:

Males	Females:	Unsexed:	Total	Not known
0	0	0	0	

17C. Does a coordinated species management program exist for this species? (Yes)

If yes, specify

17D. Is a coordinated Species Management Program recommended for range country (ies)? (Yes)

If yes, specify

18. Level of captive breeding/cultivation recommended

No ex situ program recommended

19. Are techniques established to propagate the taxon?

Techniques known for this taxon or similar taxon

20. Other Comments

Part Four

21. Sources:

Banister, K.E. 1987. Two new species of Garra (Teleostei - Cyprinidae) from the Arabian Peninsula. Bulletin of the British Museum (Natural History) 52: 59-70.

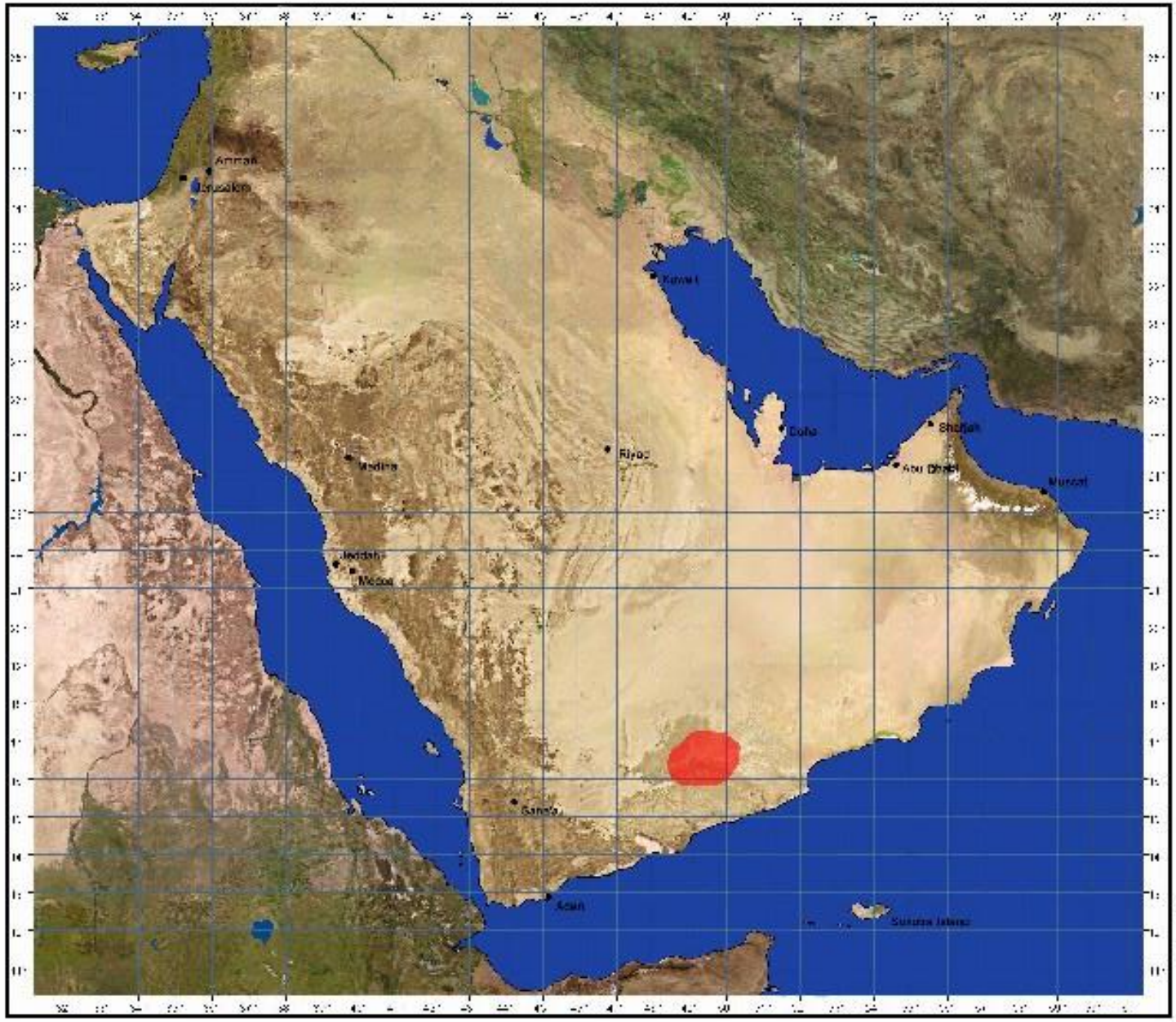
Krupp, F. 1983. Freshwater fishes of Saudi Arabia and adjacent regions of the Arabian

Garra lautior **None**

Peninsula.- Fauna of Saudi Arabia 5: 568-636. Basle & Jeddah.

22. Compilers: Damien Egan
Kais Yamour Mansoor
Pritpal Soorae
Gary Feulner
Catherine Tsagarakis
Essa Faraj
Hatem AL-Yami
Moawia Ahmed Hag Osman
Nashat A. Hamidan
Fareed Krupp
John Balfour
Majid Makky Taher

23. Reviews:



Garra lautior

0 100 200 300 400 500 Kilometers

Conservation Assessment Management Plan
Taxon Data Sheet

Garra longipinnis **None**

1.Scientific *Garra longipinnis* Banister and Clarke, 1977

1A. Synonyms: Scientific synonym / ambiguities Authority (date)

1B. Scientific nomenclature:

FAMILY: Cyprinidae
ORDER: Cypriniformes
CLASS: Actinopterygii

1C. Common Names: None

1D.Taxonomic level: Species

Notes:

2. Distribution of the Taxon

2A.Life form (plant):

2B. Habitat:

2C. Niche: Habitat specificity: Wadi (freshwater)

2D. Historical distrib: Oman

2E. Current countries: Oman

2F. Geographic. extent: Jabal Akhdar, near Saiq

2G Migration regions:

3. Approximate Area of Occurrence of the taxon in and around the area of study/ sighting/ collection

(Extent of occurrence is defined as the area contained within the shortest continuous imaginary boundary encompassing all known, inferred or projected sites of present occurrence of the taxon)

Occurrence area: < 100 sq km

Notes (Occurrence)

4. Approximate Area of Occupancy of the taxon in and around the area of study/ collection

(Area of occupancy is defined as the area occupied by the taxon within the 'extent of occurrence')

Area of Occupancy: < 10 sq km

Notes (Occupancy):

5. No. of Locations or Subpopulations in which the taxon is distributed: 1

Is there a continuous declined in subpopulations / locations?

Are there extreme fluctuations in subpopulations/ locations?

Percentage of population that lives in most important sub area:

Notes (sub pops)

6. Habitat status: Continuous

6A. Is there any change in the habitat where the taxon occurs? (Yes)

If yes, describe: Unknown

6B. If decreasing, what has been the decrease in Habitat area?

Garra longipinnis **None**

approximate change (%): over how many years:
Notes on decrease:

6C. If stable or unknown, do you predict a decline in habitat?
approximate change (%): unknown over how many years:

6D. State primary cause of change:

6E. Is there any change in the quality of the habitat where the taxon occurs? (Yes)
If yes, Describe: Unknown

6F. State primary cause of change:

Notes:

7. Threats

	Rank	Present	Future	Lead to decline	Notes on future threats

8. Trade:

8A. Is the taxon in trade? (Yes) Type of trade: Local Commercial
8B. Parts in Trade: Domestic International
8C. Which form of trade (specified form) is resulting in a perceived or inferred population decline?

9-10. Population numbers and

9A. Avg. age of parents in pop: Years

	Total Pop.	Mature
9B. Global Population:	unknown	unknown

10A. Recent past trends: Unknown Specify: declining, stable, or increasing
Rate of decline (past) For what period (years)
10B. Will population decline?
. Predicted Rate (future) For what period (years)

11. Population Data quality

11A. Estimates base on: Census or monitoring Field study Informal sightings
Indirect information Museum records Literature
Notes: Hearsay/belief

11B. Qualifiers: *Observed, Inferred, Suspected, Estimated, or Projected*

11C. Uncertainty *95% confidence, Minimum/Maximum values, Range of Opinion; Evidentiary; Precautionary; Subjective; Hypothetical; Point estimate; or Range estimate*

12. Recent Field Studies

Researcher names, Location, Dates, Topics:

Part Two
13. Status

(previous):
13A. IUCN Red List categ;- Global: Vulnerable National:
13I. IUCN Red List Categ (Current) Critically endangered 13J. Criteria basis: B1a, B2a
13B. Cites: 13C. Natl wildlife Legislation:
13D. Natl Red Data Book: 13E. Intl Red Data Book:
13F. Other legislation:

Garra longipinnis **None**

13G. Protected area presence:

13H. Endorsed protection plan:

Notes: A Long time has elapsed since the last record of the taxon.

Part Three

14. Supporting Research Is research recommended for taxon? (Yes)

Specify:	Genetic research	Taxonomic research	Life history
Survey studies	Limiting factor research	Epidemiology	Trade

14A. Is Population and Habitat Viability Assessment recommended? (Yes)

Notes:

15. Management recommendations for the taxon *Specify:*

Habitat management	Wild pop management	Monitoring	Translocation
Sustainable utilization	Public education	Genome Resource Banking	
Limiting factor mgt.	Captive breeding	Work in local communities	

Notes:

16. Captive management recommendations *If captive breeding recommended in Q15, is it for:*

Species recovery	Education	Reintroduction	Benign introduction
Research	Husbandry	Sustainable use	Preservation of live genome

Notes/other:

17. Do Captive stocks already exist? (Yes)

17A. Names of facilities:

17B. No. in captivity:

Males	Females:	Unsexed:	Total	Not known
0	0	0	0	

17C. Does a coordinated species management program exist for this species? (Yes)

If yes, specify

17D. Is a coordinated Species Management Program recommended for range country (ies)? (Yes)

If yes, specify Oman

18. Level of captive breeding/cultivation recommended

Initiate ex situ Program within 3 years

19. Are techniques established to propagate the taxon?

Techniques known for this taxon or similar taxon

20. Other Comments Species only known from type specimens, not observed or collected since 1968.

Part Four

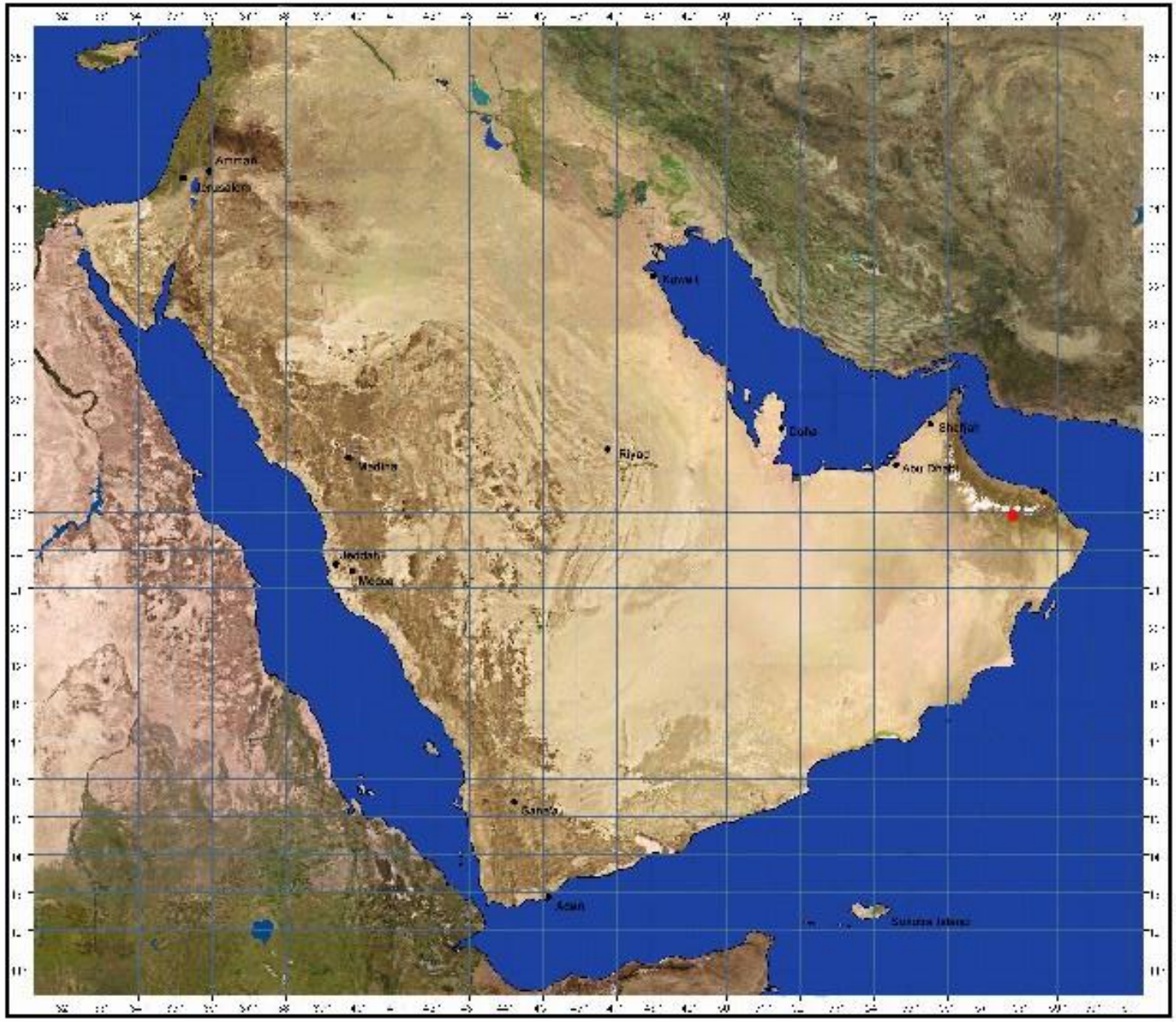
21. Sources: Banister, K.E. & Clarke, M.A. 1977. The freshwater fishes of the Arabian Peninsula. Journal of Oman Studies. Special Report: The Scientific Results of the Oman Flora and Fauna Survey 1975: 111-154

22. Compilers: Damien Egan
Kais Yamour Mansoor
Pritpal Soorae
Gary Feulner
Catherine Tsagarakis

Garra longipinnis **None**

Essa Faraj
Hatem AL-Yami
Moawia Ahmed Hag Osman
Nashat A. Hamidan
Fareed Krupp
John Balfour
Majid Makky Taher

23. Reviews: Nasser Sultan AL-Muraikhi



Garra longipinnis

0 100 200 300 400 500 Kilometers

Conservation Assessment Management Plan
Taxon Data Sheet

1.Scientific *Garra mamshuqa* Krupp, 1983

1A. Synonyms: Scientific synonym / ambiguities Authority (date)

none

1B. Scientific nomenclature:

FAMILY: Cyprinidae
ORDER: Cypriniformes
CLASS: Actinopterygii

1C. Common Names: None

1D.Taxonomic level: Species

Notes:

2. Distribution of the Taxon

2A.Life form (plant):

2B. Habitat:

2C. Niche: Habitat specificity: Wadi, habitat specificity unknown

2D. Historical distrib: Yemen

2E. Current countries: Yemen

2F. Geographic. extent: Wadi Hadramaut, Hadramaut Province

2G Migration regions:

3. Approximate Area of Occurrence of the taxon in and around the area of study/ sighting/ collection

(Extent of occurrence is defined as the area contained within the shortest continuous imaginary boundary encompassing all known, inferred or projected sites of present occurrence of the taxon)

Occurrence area: 101-5,000 sq km

Notes (Occurrence)

4. Approximate Area of Occupancy of the taxon in and around the area of study/ collection

(Area of occupancy is defined as the area occupied by the taxon within the 'extent of occurrence')

Area of Occupancy: < 10 sq km

Notes (Occupancy):

5. No. of Locations or Subpopulations in which the taxon is distributed: 1

Is there a continuous declined in subpopulations / locations?

Are there extreme fluctuations in subpopulations/ locations?

Percentage of population that lives in most important sub area:

Notes (sub pops)

6. Habitat status: Continuous

6A. Is there any change in the habitat where the taxon occurs? (Yes)

If yes, describe: Unknown

6B. If decreasing, what has been the decrease in Habitat area?

Garra mamshuqa **None**

approximate change (%): over how many years:
Notes on decrease:

6C. If stable or unknown, do you predict a decline in habitat?
approximate change (%): < 20% over how many years: 5

6D. State primary cause of change: Pumping of Water

6E. Is there any change in the quality of the habitat where the taxon occurs? (Yes)
If yes, Describe: Unknown

6F. State primary cause of change:
Notes:

7. Threats

	Rank	Present	Future	Lead to decline	Notes on future threats
3. Indirect Effects					
3.2. Alien invasive species					
3.2.5 Habitat loss					Loss of habitat due to pumping of water

8. Trade:

8A. Is the taxon in trade? (Yes) Type of trade: Local Commercial
8B. Parts in Trade: Domestic International

8C. Which form of trade (specified form) is resulting in a perceived or inferred population decline?

9-10. Population numbers and

9A. Avg. age of parents in pop: Years

	Total Pop.	Mature
9B. Global Population:	unknown	unknown

10A. Recent past trends: Unknown Specify: declining, stable, or increasing
Rate of decline (past) For what period (years)
10B. Will population decline?
. Predicted Rate (future) <10% For what period (years) 5

11. Population Data quality

11A. Estimates base on: Census or monitoring, Field study, Informal sightings, Indirect information, Museum records, Literature, Hearsay/belief
Notes:

11B. Qualifiers: *Observed, Inferred, Suspected, Estimated, or Projected*

11C. Uncertainty *95% confidence, Minimum/Maximum values, Range of Opinion; Evidentiary; Precautionary; Subjective; Hypothetical; Point estimate; or Range estimate*

12. Recent Field Studies

Researcher names, Location, Dates, Topics:

Part Two

13. Status

(previous):
13A. IUCN Red List categ;- Global: none National:
13I. IUCN Red List Categ (Current) Vulnerable 13J. Criteria basis: B1a,b; B2a,b

Garra mamshuqa **None**

13B. Cites:
13C. Natl wildlife Legislation:
13D. Natl Red Data Book:
13E. Intl Red Data Book:
13F. Other legislation:
13G. Protected area presence:
13H. Endorsed protection plan:
Notes:

Part Three

14. Supporting Research Is research recommended for taxon? (Yes)

Specify:	Genetic research	Taxonomic research	Life history
Survey studies	Limiting factor research	Epidemiology	Trade

14A. Is Population and Habitat Viability Assessment recommended? (Yes)

Notes:

15. Management recommendations for the taxon *Specify:*

Habitat management	Wild pop management	Monitoring	Translocation
Sustainable utilization	Public education	Genome Resource Banking	
Limiting factor mgt.	Captive breeding	Work in local communities	

Notes:

16. Captive management recommendations *If captive breeding recommended in Q15, is it for:*

Species recovery	Education	Reintroduction	Benign introduction
Research	Husbandry	Sustainable use	Preservation of live genome

Notes/other:

17. Do Captive stocks already exist? (Yes)

17A. Names of facilities:

17B. No. in captivity:

Males	Females:	Unsexed:	Total	Not known
0	0	0	0	

17C. Does a coordinated species management program exist for this species? (Yes)

If yes, specify

17D. Is a coordinated Species Management Program recommended for range country (ies)? (Yes)

If yes, specify

18. Level of captive breeding/cultivation recommended

No ex situ program recommended

19. Are techniques established to propagate the taxon?

Techniques known for this taxon or similar taxon

20. Other Comments

Part Four

21. Sources:

Krupp, F. 1983. Freshwater fishes of Saudi Arabia and adjacent regions of the Arabian Peninsula.-Fauna of Saudi Arabia 5: 568-636. Basle & Jeddah.

Garra mamshuqa **None**

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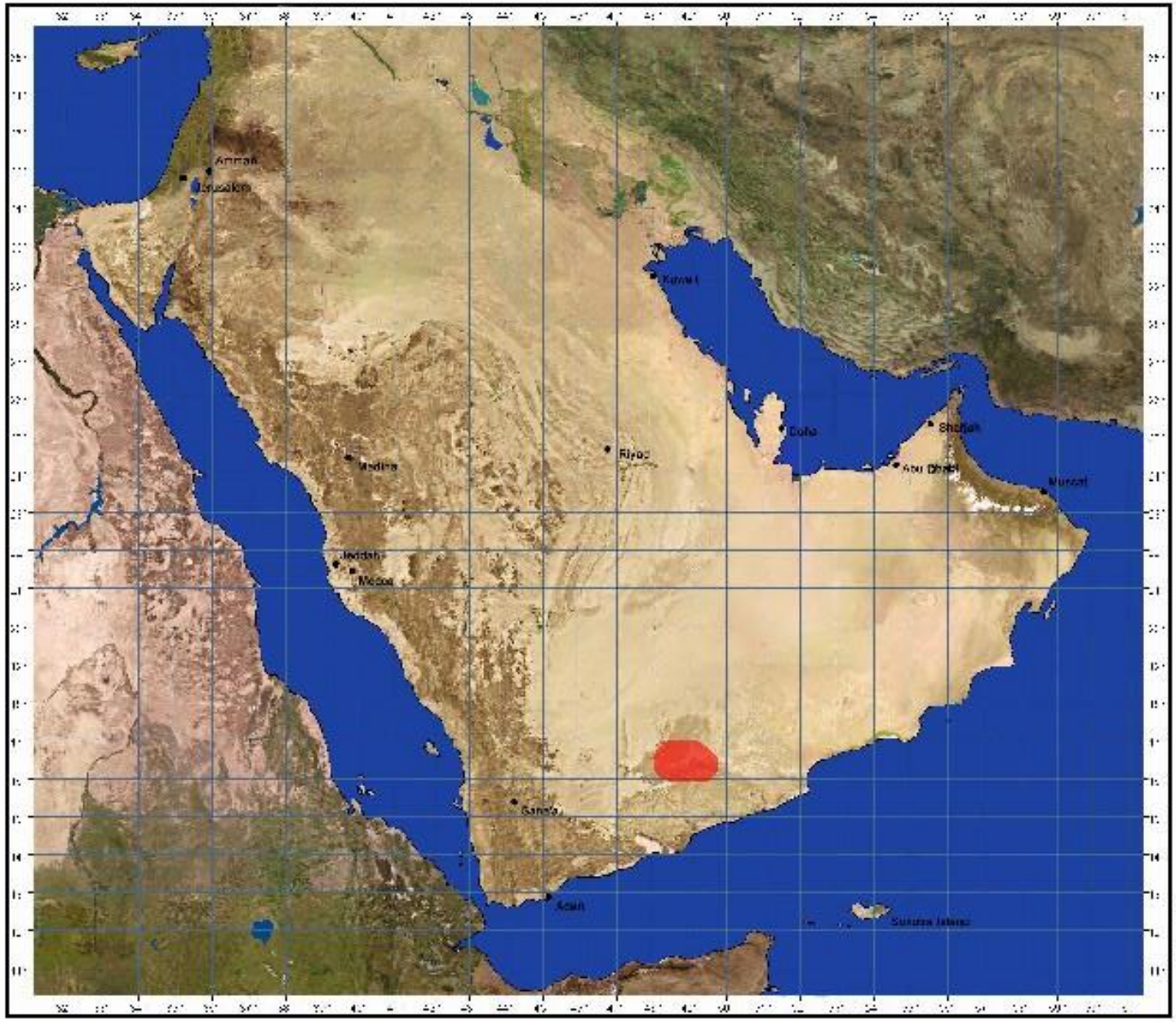

Garra mamshuqa

0 100 200 300 400 500 Kilometers

Conservation Assessment Management Plan
Taxon Data Sheet

1.Scientific *Garra sahilia* Krupp, 1983

1A. Synonyms: Scientific synonym / ambiguities Authority (date)

1B. Scientific nomenclature:
FAMILY: Cyprinidae
ORDER: Cypriniformes
CLASS: Actinopterygii

1C. Common Names: None

1D.Taxonomic level: Species

Notes:

2. Distribution of the Taxon **Country (ies)** **Primary (yes)**

2A.Life form (plant): Saudi Arabia
Yemen

2B. Habitat:

2C. Niche: Habitat specificity: wadi, wide range

2D. Historical distrib: Yemen, Saudi Arabia

2E. Current countries: Yemen, Saudi Arabia

2F. Geographic. extent: Gulf of Aden and Red Sea drainage of Yemen, Red Sea drainage of Saudi Arabia

2G Migration regions:

3. Approximate Area of Occurrence of the taxon in and around the area of study/ sighting/ collection

(Extent of occurrence is defined as the area contained within the shortest continuous imaginary boundary encompassing all known, inferred or projected sites of present occurrence of the taxon)

Occurrence area: > 20,000 sq km

Notes (Occurrence)

4. Approximate Area of Occupancy of the taxon in and around the area of study/ collection

(Area of occupancy is defined as the area occupied by the taxon within the 'extent of occurrence')

Area of Occupancy: 11-500 sq km

Notes (Occupancy):

5. No. of Locations or Subpopulations in which the taxon is distributed: 10

Is there a continuous declined in subpopulations / locations?

Are there extreme fluctuations in subpopulations/ locations?

Percentage of population that lives in most important subarea:

Notes (subpops)

6. Habitat status: Fragmented

6A. Is there any change in the habitat where the taxon occurs? (Yes)
If yes, describe:

6B. If decreasing, what has been the decrease in Habitat area?
approximate change (%): over how many years:
Notes on decrease:

Garra sahilia **None**

6C. If stable or unknown, do you predict a decline in habitat?
approximate change (%): < 20% over how many years:
6D. State primary cause of change: Pumping of water
6E. Is there any change in the quality of the habitat where the taxon occurs? (Yes)
If yes, Describe:
6F. State primary cause of change:
Notes: Status of and changes in habitat are unknown

7. Threats

	Rank	Present	Future	Lead to decline	Notes on future threats
3. Indirect Effects					
3.3. Ecological imbalance					
3.3.5 Habitat loss					Due to water pumping

8. Trade:
8A. Is the taxon in trade? (Yes) Type of trade:: Local Commercial
8B. Parts in Trade: Domestic International
8C. Which form of trade (specified form) is resulting in a perceived or inferred population decline?

9-10. Population numbers and
9A. Avg. age of parents in pop: 2 Years

	Total Pop.	Mature
9B. Global Population:	> 10,000	> 10,000

10A. Recent past trends: Specify: declining, stable, or increasing
Rate of decline (past) For what period (years)
10B. Will population decline?
. Predicted Rate (future) 20% or more For what period (years) 5

11. Population Data quality
11A. Estimates base on: Census or monitoring, Field study, Informal sightings, Indirect information, Museum records, Literature, Hearsay/belief
Notes:
11B. Qualifiers: *Observed, Infeerred, Suspected, Estimated, or Projected*
11C. Uncertainty *95% confidence, Minimum/Maximum values, Range of Opinion; Evidentiary; Precautionary; Subjective; Hypothetical; Point estimate; or Range estimate*

12. Recent Field Studies
Researcher names, Location, Dates, Topics:

Part Two
13. Status
(previous):
13A. IUCN Red List categ;- Global: National:
13I. IUCN Red List Categ (Current) Least Concern 13J. Criteria basis:
13B. Cites: 13C. Natl wildlife Legislation:
13D. Natl Red Data Book: 13E. Intl Red Data Book:

Garra sahilia **None**

13F. Other legislation:

13G. Protected area presence:

13H. Endorsed protection plan:

Notes:

Part Three

14. Supporting Research Is research recommended for taxon? (Yes)

Specify:	Genetic research	Taxonomic research	Life history
Survey studies	Limiting factor research	Epidemiology	Trade

14A. Is Population and Habitat Viability Assessment recommended? (Yes)

Notes:

15. Management recommendations for the taxon *Specify:*

Habitat management	Wild pop management	Monitoring	Translocation
Sustainable utilization	Public education	Genome Resource Banking	
Limiting factor mgt.	Captive breeding	Work in local communities	

Notes:

16. Captive management recommendations *If captive breeding recommended in Q15, is it for:*

Species recovery	Education	Reintroduction	Benign introduction
Research	Husbandry	Sustainable use	Preservation of live genome

Notes/other:

17. Do Captive stocks already exist? (Yes)

17A. Names of facilities:

17B. No. in captivity:

Males	Females:	Unsexed:	Total	Not known
0	0	0	0	

17C. Does a coordinated species management program exist for this species? (Yes)

If yes, specify

17D. Is a coordinated Species Management Program recomended for range country(ies)? (Yes)

If yes, specify

18. Level of captive breeding/cultivation recommended

No ex situ program recommended

19. Are techniques extablished to propagate the taxon?

Techniques known for this taxon or similar taxon

20. Other Comments

Part Four

21. Sources: Krupp, F. 1983. Freshwater fishes of Saudi Arabia and adjacent regions of the Arabian peninsula.- Fauna of Saudi Arabia 5: 568-636. Basle & Jeddah.

22. Compilers: Damien Egan
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Garra sahilia **None**

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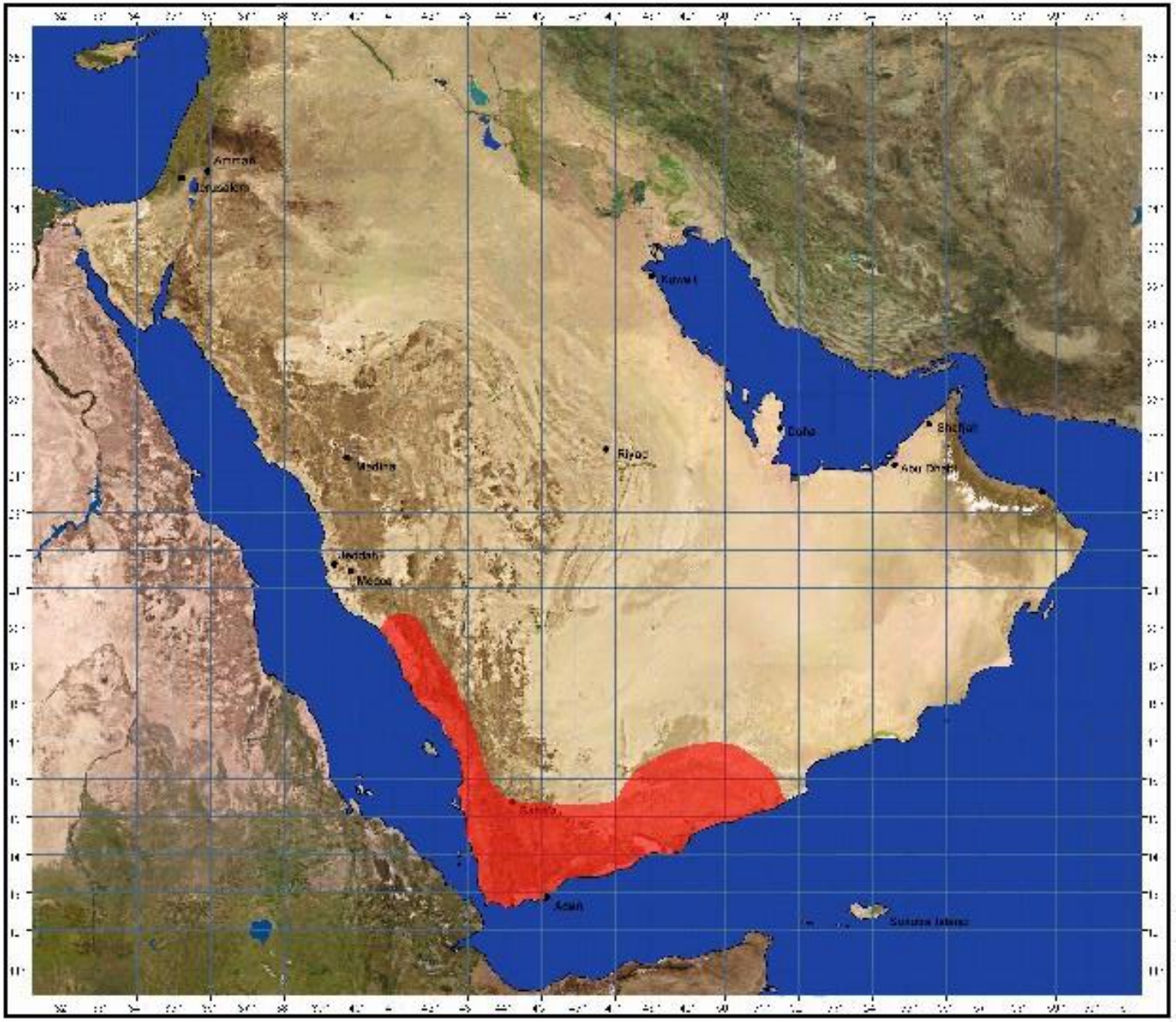

Garra sahilia

0 100 200 300 400 500 Kilometers

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Conservation Assessment and Management Plan Workshop 2002

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