

A Report on a survey of Terrestrial Mammals and Reptiles of Arzanah

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TERRESTRIAL ENVIRONMENT RESEARCH CENTRE

ENVIRONMENTAL RESEARCH & WILDLIFE
DEVELOPMENT AGENCY
P.O. Box 45553
Abu Dhabi

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| Prepared by: | Drew, C.R. | | |
| Submitted by: | Drew, C.R. | | |
| Approved by: | Newby, J. | | |
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| Team Members | Drew, C.R.// Al Hemiri, A.// Soorae, P.// Khan, S. | | |

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Introduction

During the 2001 survey of Arzanah Island, three species of terrestrial mammals and three species of terrestrial reptiles were recorded.

The mammals species were:

| | |
|-------------|--------------------------|
| Feral Cat | <i>Felis cattus</i> |
| Brown Rat | <i>Rattus norvegicus</i> |
| House Mouse | <i>Mus musculus</i> |

Mice and rats are commensal species, existing on Arzanah because of the food and shelter provided as a result of the human presence on the island. Cats were probably brought over to the island when the oil facility was being developed (although they may have been brought over earlier on pearling or fishing boats). Cats, however, are not dependent on the presence of humans...humans simply facilitated their arrival onto the island whilst birds, mice and reptiles provided their food source.

The three species of reptiles recorded on Arzanah were:

| | |
|---------------------|------------------------------|
| Short-nosed lizard | <i>Mesalina brevirostris</i> |
| Baluch rock gecko | <i>Bunopus tuberculatus</i> |
| Turkish house gecko | <i>Hemidactylus turcicus</i> |

Following the 2001 survey, ERWDA recommended that in order to protect the nesting bird population, especially Terns and Red-billed Tropic Birds, it was important to control and if possible, eradicate the cat population. History has shown that cats have the potential to be responsible for the extinction of some bird species on islands and it was important that this not be allowed to happen on Arzanah.

Further recommendations included:

- Continuation of rodent pest control measures
- Improvement of waste management techniques
- Control of feral pigeons

The 2003 survey was carried out in order to monitor reptile and mammal biodiversity on the Island and to assess the success / failure of the recommendations made in the 2001 report.

Methods

A field visit to Arzanah Island by three staff from the Terrestrial Environment Research Centre, was carried out from 29th September 2003 to 1st October 2003. During this visit a detailed survey of reptiles was carried by visually searching different habitat types during the day and the night. During the search for reptiles, a search for tracks and spoor of mammals was also made.

A second field visit was carried out from 20th October 2003 to 22nd October 2003 with the specific objective of estimating rodent density, as it had been observed during the first visit that rodent tracks were found across the entire Island. Furthermore, the visit was timed to coincide with a routine visit to the Island from the National Hotel Company Pest Control Section.

During the rodent survey 5 sites were surveyed using 30 small mammal traps at each site:

- Site 1 The Police camp
- Site 2 The waste burning area
- Site 3 Abandoned D-camp
- Site 4 A mountain site
- Site 5 A Coastal site

At Sites 1 and 4, traps were deployed in a high density trapping web configuration. I.e. 5 traps were deployed along each of six radial lines emanating from a central point. The angle between each line was 60° and trap spacing along the line was 2 metres.

At site 2, traps were deployed along a U shaped transect with segments of 10metres and traps spacing of 2 metres.

At site 3, traps were deployed strategically throughout the building.

At site 5, traps were deployed along the landward side of a 150 metre stretch of the coastal road. Trap spacing was 5 metres.

The conventional method used by TERC for estimating population density uses a trapping web approach; however, this method was not applicable at all the sites and therefore the methods were modified to allow the estimation of relative population density.

Additionally, traps were set around the heavy equipment garage and workshop, the accommodation block and the water injection plant site offices. At these sites, a combination of baited small mammal traps and baited sticky traps were deployed along suspected runways. The purpose of trapping at these locations was to assess presence/absence of rodents rather than assess population density.

The trapping sites are shown in Figure 1.



Figure 1 Satellite image of Arzanah Island illustrating survey locations

Results and discussion

During the 2003 survey, five reptile and one mammal species were recorded.

1. Reptiles

Surveys were carried out in 6 different habitat types and the results are presented below:

| Habitat type | Bunopus tuberculatus | Mesalina brevirostris | Pristurus rupestris | Cyrtodactylus scaber | Hemidactylus turcicus |
|--------------------------------|----------------------|-----------------------|---------------------|----------------------|-----------------------|
| Accommodation buildings | occasional | Absent | Absent | Common | common |
| Chain / equipment storage yard | Occasional | Absent | Occasional | Absent | Absent |
| Mountain / wadi | Occasional | Occasional | Absent | Absent | Absent |
| Coastline | Common | Common | Absent | Absent | Asbsent |
| Coastal plain | Common | Common | Absent | Absent | Absent |
| Roadside greening areas | Common | Absent | Absent | Common | Absent |

There are two significant observations that can be made from the reptile survey results:

The first is that *Pristurus rupestris*, a small semaphore gecko found throughout rocky and mountainous areas; was not found at all in the mountains. The only site at which it was found was a scrap chain / scrap metal yard. The second observation was that many of the geckos along the coast and almost all the geckos around the accommodation area and within the roadside greening areas had tails that showed evidence of previous damage.

One of the defence mechanisms of lizards is the ability to shed their tail when it is caught by a predator. Essentially the predator seizes the lizard by its tail; the lizard then sheds its tail which continues to writhe about, distracting the predator and giving the lizard time to flee and seek refuge. When the lizard's tail re-grows, it grows back with a different pattern and often, no pattern at all.

The fact that many of the lizards had escaped from predators and that one species was not present within, what should have been, its preferred habitat, was highly suggestive of a high density of predators.

The most common predators of lizards are either larger lizards, avian predators, such as raptors and shrikes, or rodents.

2. Mammals

During the first field visit, the only mammal tracks recorded were those belonging to house mice, *Mus musculus*. Based on these findings, a second visit was scheduled and the results are presented below:

| Site | Number of traps set | Number of animals caught |
|----------------------------|---------------------|--------------------------|
| Site 1, police camp | 30 | 42 |
| Site 2, waste burning area | 30 | 47 |
| Site 3, abandoned D camp | 30 | 1 |
| Site 4, mountain | 30 | 30 |
| Site 5, coast | 30 | 40 |

The number of rodents caught was too high for the estimation of population density using the traps that were chosen. The small mammal traps that were used, Sherman traps, are designed for single captures only. However at all sites except the D-camp site, many traps caught two and sometimes three individuals, suggesting that in some cases one or more animals must have entered a trap simultaneously and the trap was unable to close due to another mouse being present on the trap door, preventing it from closing. If the capture limit of the trapping web has been exceeded it is impossible to derive population density estimates.

Nevertheless, it is clear that the population density of mice is extremely high and that the infestation of mice should be dealt with as a matter of urgency by the pest control contractors. The fact that mice were recorded at such high densities all over the island is alarming for biodiversity conservation. Mice could have a significant impact on the seed bank, could damage or destroy freshly germinated plant seedlings and will also eat young lizards and lizard eggs.

3. Recommendations

The pest control company used to come to Arzanah twice monthly, this has now been increased to weekly visits.

The strategy adopted by the pest control company was to place commercial baited poison pellets around the mice burrows outside the accommodation building and around the Police Camp. Additionally 'sticky traps' (cardboard sheets covered with a non-toxic adhesive) were placed at strategic points inside the accommodation building and within other offices and building throughout the island.

This method works well for controlling mice at extremely low densities, but is not appropriate when there is a severe infestation. In order to control the mouse population an integrated pest control strategy must be developed, involving preventative as well as control measures.

Preventative measures

We highly recommend that certain preventative measures be adopted by the management of Arzanah Island. These include:

1. Instructing the police not to feed the feral pigeons. Currently the police are feeding the feral pigeons around their camp during the day with waste food. This practice must be stopped immediately. The food that is left over by the pigeons is then eaten by the mice at night. Such an abundant source of food has allowed the population to explode to a high density.
2. Waste management is an issue that needs to be addressed at a high level. Currently it would appear that garbage is dumped at a designated site and burned periodically. The unburned garbage provides food, shelter and nesting material for mice. During the site visit, sticky traps as well as live traps were placed around the garbage dump; 47 animals were caught in the live traps and more than 20 individuals were caught on just three sticky traps. The situation with regard to the mice infestation around the garbage dump is of considerable concern.
3. Kitchen waste. Kitchen waste is deposited in a small shed around the side of the kitchen. Improvements to this facility need to be made to prevent access to it by mice. The point of concern with respect to this issue is that it is facilitating the breeding of mice outside the kitchen, which could have hygiene implications.
4. Staff awareness, staff should be made aware that simple preventative measures (covering food, disposing of waste food in appropriate bins) can be adopted to help reduce the rodent population.

Pest Control Measures

With regard to pest control, at the moment it would seem that mice are breeding at a higher rate than they are being exterminated (by the pest control company). Furthermore, because of the food resources made available to the mice, the carrying capacity (for mice) of the island is very high and the growth rate. If there is no competition between individuals for resources (known as intra-specific competition) and no competition with other species for resources (known as inter-specific competition), then the population growth rate will be exponential.

The problem facing the pest control company is that even if they killed 90% of the population, the factors that influence population growth rate – fecundity (of mice), resource availability and absence of competition (intra- and inter-specific) still remain and the population could 'rebound' to the same high levels.

1. A more aggressive, methodical approach needs to be taken, targeting breeding sites. Currently the main breeding areas appear to be the garbage dump and around the police camp. However, there may be other sites – this is something that would require some further investigation. Large numbers of sticky traps should be deployed around the breeding sites and if possible, a member of the National Hotel Company staff should be assigned to check or replace the traps daily. Records should be kept of where traps were deployed and how successful they were – this will facilitate both monitoring of success and identifying problem areas.
2. The pest control company should purchase some pigeon traps (see list of equipment suppliers) and trap the feral pigeons around the police camp. Feral pigeons are closely associated with mice and are considered to be vermin. The live traps recommended in the appendix are non lethal and allow non-target species to be released un-harmed. The pigeons can then be removed and euthanased.
3. Mouse burrows around the date palm trees should be unearthed.
4. Pest control within the accommodation building and other buildings should continue.

Long Term Control Measures

Once the pest problem is under control, consideration may be given to long term control measures.

These should include the maintenance of a higher standard of waste management and high level of awareness.

Background control by the pest control company should continue.

The potential for introducing some natural predators of mice could be considered, clearly re-introduction of cats should not be recommended, but the possibility of releasing native owls (such as little owls or eagle owls) and the construction of nesting boxes could be explored.

List of equipment suppliers

1. Sherman traps www.shermantraps.com

Suppliers of folding live traps. Model LFAHD was used by ERWDA during the surveys of Arzanah.

2. Tomahawk traps www.tomahawklivetrap.com

Suppliers of cage traps. It is recommended that several numbers of Model 502 be purchased for the control of feral pigeons.