internal

report



# **Aboriginal Land Management**

## **Can Scientists Help?**



## Lisa Thurtell (*eriss*), Bob Pidgeon (*eriss*) and Dean Yibarbuk (Bawinanga Aboriginal Corporation)

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## Abstract

The Bawinanga Aboriginal Corporation (BAC) represents outstation communities living near Maningrida in Central Arnhem Land. The BAC is keen to set standards for wetland management by Aboriginal groups in the Top End. They have asked *eriss* to assist their community rangers to assess the ecological status of their wetlands (Djelk wetlands). Based on this and other assessments the BAC will formulate a management plan which reflects the aspirations of their community for future use and protection of those wetlands.

Macroinvertebrate, fish and plant surveys were undertaken in the 1996 and 1997 dry seasons. BAC Community Rangers participated in the surveys, received training in survey work and exchanged knowledge with *eriss* scientists. The information exchange before, during and after the surveys was crucial in the formulation of objectives, site selection and reporting processes, and provided some unparalleled insights into Aboriginal wetland use and management.

The challenge for *eriss* is to focus on the needs of the BAC and to interactively help create an information base for the Djelk wetlands management plan. The challenge for BAC is to make "wise use" of "Balanda" processes to ensure the future of their wetlands.

### Introduction

In 1996 the Northern Land Council (NLC) facilitated Top End Indigenous People's Wetlands Program (TEIPWP) which was initiated to assist Aboriginal communities develop management plans for important wetland sites in the Top End. The program received three years of funding from Environment Australia. It is also reliant on the expert advice and resources of a number of organisations, in particular Environmental Research Institute of the Supervising Scientist (*eriss*), Northern Territory Parks and Wildlife Commission (PWC), Department of Land Planning and Environment (DLPE) and the Northern Territory University (NTU).

The focus for the first year of the TEIPWP was the wetlands of the Bawinanga Aboriginal Corporation (BAC). These were chosen primarily because of the enthusiasm of the local community rangers, the Djelk Community Rangers, and the vision of the Chief Ranger, Mr Dean Yibarbuk. The existence of a functional organisational structure within the BAC also made the area very attractive to the program.

The Djelk Rangers had received basic ranger training through the NLC's Caring-for-Country (CFC) program during 1994 and were seeking assistance in developing a wetland management plan. Consultations with the Djelk Rangers were undertaken in the middle of 1996 to elicit the major issues for the wetlands as well as the Traditional Owner's aspirations for those wetlands. The consultation process was important to ensure that the program belonged to the community and that they had ownership (ie control of planning, research and development agendas) and direct participation.

The BAC invited *eriss* to participate in the development of the Djelk Wetland Management Plan. Following meetings with the BAC and the Community Rangers, *eriss* critically assessed its approach to community consultations. From this assessment *eriss* investigated ways of improving and increasing information exchange with local communities. Changes have included increased community consultation, participation in cross-cultural awareness training, production of plain English summaries of research projects and the appointment of an Aboriginal Liaison Officer.

## The Bawinanga Aboriginal Corporation

The BAC was established in 1973 to service outstation communities in the Maningrida Homelands Region. Outstations are small, mostly permanent communities which are isolated from the larger settlements. The outstation movement grew in strength with the advent of the Aboriginal Land Rights Act (1976) and increasing numbers of Aboriginal people left settlements such as Maningrida to return to their traditional clan estates. BAC, through various funding sources, helps provide housing, water supplies, ablution facilities and other infrastructure to these outstation communities.

The BAC's mission is to maintain and improve outstation life by keeping their land, culture and people strong using traditional and non-traditional ways to care for country. They have identified the special values of their wetlands which in their own country are called Djelk. The word Djelk comes from the local Gurrgoni language and means "land" and "caring for the land". Thus, the word intricately links the land to its care.

The BAC logo identifies key issues for the community (Fig. 1). The fish trap signifies bringing and holding people together for decisions about the land. The water lily links the earth, water

and air, it is a thing of beauty and a source of food. The two stems stand for two laws - traditional and balanda (non-aboriginal). The lily bulbs and roots represent people in the district. The dilly bag holds the important messages for all the people of the Djelk wetlands (BAC 1996).

The strong feeling that the BAC have for the care of the land is formalised through participation in the NLC CFC program. Through this program BAC has been able to train community rangers and put in place feral animal, weed, fire and other wetland programs. The community identifies the most important issues to direct the planning, research and development processes of these programs.

The NLC uses the following protocols to ensure the process is driven and controlled by the Djelk community.

- 1. The community identifies the most important management issues.
- 2. The community has ownership of the planning process and the management outcomes.
- 3. Research and development enterprises are issues directed.
- 4. Identified projects are managed by the community.
- 5. The community actively participates in all projects in collaboration with other relevant organisations and government agencies.
- 6. Education and training are important components of all projects.

The Djelk people recognise two knowledge systems; indigenous and scientific. Meetings were arranged with government and research groups that could contribute to the Djelk Wetland Management Plan. These helped to identify knowledge gaps and training needs.



Figure 1 Bawinanga Aboriginal Corporation Logo

## The Djelk Wetlands

The Djelk Management Plan area is within longitudes 12° to 14° south and latitudes 132° to 134°50′ east. It consists of a diverse series of wetlands covering about 100 000 hectares of Arnhem Land in the Northern Territory (Figure 2). The major river systems within the wetlands are the Liverpool-Tomkinson and the Blyth-Cadell. The Liverpool-Tomkinson River System is the largest of the tidal river systems of northern Arnhem Land (Messel *et al.*, 1979). The Liverpool drains a catchment area of 7250km<sup>2</sup> and the Tomkinson catchment area is about 875km<sup>2</sup> (Messel *et al.*, 1979). The Blyth-Cadell River System drains a catchment of 6200km<sup>2</sup> (Messel *et al.*, 1981). These river systems contain some of the best examples of relatively unmodified coastal floodplains in the Northern Territory (Briggs 1981).

The climate consists of uniformly high temperatures with average daily maximum temperatures above 30°C and average annual temperatures around 27°C. The highest maximum temperatures are generally experienced in November. Average annual rainfall at Maningrida is 1290mm, most of which falls between November and March. Average annual potential evaporation is approximately 2800mm.

The low flat topography of the Top End coastal plains and seasonally wet monsoonal climate produces widespread and prolonged flooding. The duration, depth and extent of flooding on the plains are highly variable. The floodwaters on the coastal plains are derived from three sources; direct inputs from rainfall (precipitation dominated), tidal influence and excess flow from channels (streamflow dominated) (Kingston 1991). The flow balance is complicated as surface slopes, storage changes and infiltration components affect flooding patterns on the coastal floodplains.

The largest human population centre within the wetlands is Maningrida. It is located about 400km east of Darwin and has a population of about 1800 people with the surrounding area supporting outstation communities with a combined population of about 700. Many of the traditional clans utilise resources from wetlands in the Liverpool-Tomkinson Rivers Systems and the Blyth-Cadell Rivers Systems.

## Training

The CFC Ranger Program is a joint project of the BAC and NLC and involves organisations such as Parks Australia North (Environment Australia), NT Parks and Wildlife Commission, NT Department of Primary Industries and Fisheries and the NT Department of Land Planning and the Environment. The Rangers are currently receiving training from NTU through a certificate course in resource management They have also received training in soil conservation, bush fire management, GPS operation, feral animal and weed control.

Training objectives are based on priority issues which have been identified by the community rangers and local community. Weeds, in particular mimosa (*Mimosa pigra*), and wetland mapping that included clan boundaries (to see who was responsible for the land) were seen as major issues by the Djelk. The Rangers also expressed an interest in the commercial utilisation of both animals and plants. From these issues projects have been developed with individual rangers assigned to specific projects. Rangers work alongside visiting researchers or management personnel, a process which facilitates two-way learning that could lead to an amalgam of traditional and scientific ecological knowledge.



Figure 2 Location of Maningrida and Djelk Wetlands

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A need for more information regarding the current health of the wetlands and to detect potential threats or problem areas was also identified. *eriss* offered to assist the BAC with these baseline studies and to become involved in the collation of information relevant to the Djelk Wetland Management Plan. *eriss* staff provided training in the collection of water samples, testing physical and chemical water variables, collecting and live-sorting macroinvertebrates (Figure 3). *eriss* staff also showed fish and plant surveying techniques to accompanying CFC community rangers. Rangers were able to show *eriss* staff appropriate study sites and the indigenous name and use of many of the plants and fish. Other institutions, such as NTU, involved in research in the area have also been assisted by the rangers and have provided the rangers with an insight into their research techniques.

Any studies being undertaken by outside organisations have this training component for the CFC Rangers. This has been developed for a number of reasons. Firstly, knowledge was being taken away by Balandas and not being used to help the community. There is also a need for rangers and/or traditional owners to accompany visitors to make sure they do not go into restricted places or act inappropriately. Rangers are also able to guide visitors to the most suitable sampling locations and obtain the senior land owner's permission for access. There is also the benefit of information exchange where people who know the land well can explain many aspects to those who may have specialised knowledge but may not know the land.

## **On-going Studies**

After a series of consultations between BAC (including the community rangers) and *eriss* an initial macroinvertebrate survey was undertaken in 1996. The information exchange before, during and after the surveys was crucial in the formulation of objectives, site selection and reporting processes.

The aims of the macroinvertebrate survey were to document community structure, identify possible threats or disturbances, train BAC Rangers and share knowledge. The first survey was conducted over a week in both lotic and lentic habitats using MRH methods during the 1996 late dry season. There has been a follow up macroinvertebrate survey in the early dry 1997 and a limited plant survey was undertaken at the same time. A fish survey was also undertaken in the late dry season of 1996.

The macroinvertebrate survey revealed a diverse faunal assemblage typical for many Top End water bodies. The streams are poorly buffered with low nutrient concentrations and low turbidity. The brackish nature of some sites resulted in the collection of animals usually found in the marine environment and, of course, not normally found by *eriss* staff studying the freshwater systems of the Alligator Rivers Region (ARR).

The BAC expressed an interest in exploring the possibility of harvesting wild freshwater fish for the aquarium trade. The first step in this process would be to determine what species occur in the four river systems of the Djelk wetlands, which zones and habitats they inhabit and some idea of their abundance. This information could be used for market research to evaluate the economics of such a venture. Through discussion between landowners, *eriss* staff and other experts, possible procedures for harvesting different fish species in a sustainable manner could be developed. One problem may be that the most valuable species will be those that are, (a) rare and, (b) difficult to breed in captivity.



Figure 3 BAC Rangers with eriss Staff

In an initial survey in November last year Bob Pidgeon and others managed to sample the isolated pools in lowland channels of three rivers. 26 species were recorded. Sampling effort was limited by the lack of a boat and the sighting of crocodiles in some appropriate fish sampling sites. Consequently, this is unlikely to be an adequate inventory of species at this stage. Another survey is planned for October or November 1997 when it is hoped to sample some permanent reaches of the headwaters and larger lowland/floodplain billabongs. Most notable so far was the finding of the threadfin rainbowfish (*Iriatherina werneri*) in the Cadell and Mann Rivers. This was previously recorded in the NT only in 1993 from a tributary of the Goyder River further to the East. It also occurs on Cape York and in New Guinea. It could also be a useful aquarium trade candidate if it is sufficiently abundant.

The BAC are also interested in setting up a field herbarium which would help preserve and document plants in the area which are of use to the traditional owners. Kym Brennan recently visited Maningrida to locate and take specimens of unusual or rare plants and to train two CFC Rangers in procedures associated with documenting and preserving plants.

Other studies include the abundance and distribution of trepang (sea cucumber) and the mapping of crocodile nest distribution using GIS. Both studies are being undertaken by NTU post-graduate students.

## Balanda Knowledge Gaps

It is important to differentiate between Balanda and Djelk knowledge gaps. For Balandas there are large knowledge gaps for the Djelk wetlands. Though bird and crocodile surveys are conducted by PWCNT, other information concerning the vegetation and hydrology of the area is limited. Of course there is extensive indigenous knowledge of the area but some knowledge may have been lost over the years particularly when outstations were less populated. The Djelk people are willing to share their knowledge but only some of their traditional knowledge has been formally documented.

Most of the aquatic research on Top End floodplains and lowlands has focussed on permanent billabongs of the ARR (Pidgeon and Humphrey, 1995) and the Mary River in recent years. Apart from surveys of vegetation and birds, and some partly published work on fish, buffalo and water rats, there has been little work on the seasonal floodplain swamps anywhere in the Top End. As these can be the dominant habitat of the wetlands, this deficiency needs to be redressed. Information on the contribution of the seasonal swamps to the production of economically important fisheries of northern Australia is required. They are undoubtedly important in recruitment processes for many species as well as providing major sources of food for fish (Pidgeon and Humphrey, 1995)

Other knowledge which is essential for the appropriate 'wise use' management of the Djelk wetlands includes feral animal numbers, extent of damage and pest control mechanisms, current and potential weed problems, sustainable harvest procedures and existing degradation. Small bits of this information are currently available but a more complete picture is crucial for the maintenance of the wetland's ecological integrity.

## Problems

The small population base of the Northern Territory makes access to appropriate resources necessary to maintain extensive wetlands difficult. However, as the Top End indigenous population is increasing four times faster than the rest of the country, this too may bring environmental stresses to the wetlands. With increasing external threats, such as feral animals and weeds, and economic pressures, a new approach needs to be adopted to cope with the changing conditions. Traditional owners of the Djelk wetlands want to care for their land but also need to use the wetlands for economic gain. To cope with these changing needs the protection of wetlands requires further funding.

The difficulties faced by scientists are predominantly related to communication and the urge to satisfy research desires sometimes at the cost of not meeting information requirements for management purposes. Many scientists are unfamiliar with the community consultation process and the temptation to promote special research interests, though well intentioned, may be strong. Objectivity and neutrality are essential assets during this process. As is patience.

A description of decision making in Japanese business is probably appropriate for community consultation. SLOW, SLOW, FAST. It proves counter productive to attempt to hasten a response until all parties have had ample time to discuss and develop their positions on particular matters. To try to force an issue too soon sees the planning process grind to a halt and enthusiasm for the project wane. If time is put into the initial consultative process and a consensus can be reached then things can progress rapidly.

Unfortunately the need for outcomes within a particular time frame can seriously limit the amount of time that can be allocated to this initial phase.

There is also the question of information. Can there ever be enough information? Such a vast area to be managed and such little information currently available for the Djelk Wetlands. When is there sufficient information to ensure the adequate management of the wetlands? The management planning process must begin somewhere so all available information, both traditional and scientific, must be used to make sensible management decisions. The management plan must be flexible enough to incorporate new information and, if need be, adjust management strategies.

## **Any Solutions?**

Government funding has financed specific programs such as the TEIPWP and CFC. Both programs have helped focus attention on the wetlands and identified problems and possible solutions. The CFC Ranger Program has been instrumental in helping traditional owners become familiar with feral animal and weed management which are fairly new problems in their wetlands.

The best way for scientists to facilitate community consultation is to LISTEN. The message from the community sometimes is slow to emerge but it is needed. Scientists need to offer advice and perhaps some guidance, but the management plan must be owned by the community if it is to be adopted. It must also be a flexible working document that is accessible to everyone.

Long term secure funding is required. Effective community consultation needs funding which will continue for at least 3 years. In the meantime, BAC becomes increasingly financially independent which will give them the ability to set their own agenda and timetable. The

purchase of earth moving equipment allows the BAC to tender for road improvements in the area, the BAC mud brick factory supplies local housing projects and a crocodile egg harvesting and hatching program is underway. Other opportunities exist such as the Trepang and crocodile harvesting project. However, the management plan needs to be in place to ensure the "wise use" of these resources.

BAC has built a field laboratory within the Djelk wetlands to facilitate research by visiting scientists. In time, it will contain a laboratory, herbarium and accommodation for researchers. The BAC hopes this facility will attract people interested in wetland protection and willing to assist Traditional Owners with management options.

## Where is the management plan now?

A technical review of information was undertaken to determine what information was documented and to elicit gaps in the knowledge base. The document has been produced largely to set the scene for researchers. After the production of the document further consultation will take place with the Djelk Rangers and community in the development of a management plan. In this way the program will still belong to the community. The technical review of information will also help with a possible submission to Ramsar for the listing of the wetlands as Internationally Important.

The information document and a plain English summary will be given to the BAC. Following community consultation and advice from experts in the management of weeds, feral animals, fire, etc., a working draft of the management plan will be put together. This will be a flexible working document which will be designed to change with increasing knowledge and community needs.

## **Concluding Remarks**

The BAC hope to achieve ecological sustainable development to benefit the outstation communities of the Djelk wetlands through the implementation of management strategies formulated through community consultation and expert advice. Ecological sustainable development is the 'wise use' of wetlands for the benefit of the community which is compatible with the maintenance of ecological character of the wetland. Ecological character can be defined as the structure and interactions between the biological, chemical, and physical components of the wetland.

Presently the Djelk wetlands provide a very essential supplementary income for many outstation communities. Without the use of this resource base the lifestyle and nutritional standards of the outstation communities would be reduced. The maintenance of outstation life allows Aboriginal knowledge of country and their culture to be passed from generation to generation.

From an ecological perspective the maintenance of the biological integrity of the Djelk wetlands would assist the protection of water quality and species diversity associated with the area. With correct land management the economic value of the area could increase with the expansion of tourism and the commercial harvest of some of the natural resources.

Detailed studies documenting cultural and economic aspects of the outstation communities have been completed (eg. Chaloupka, 1993, Altman, 1987, Meehan, 1982). These studies have described rock art, the economy of outstations and the types and amount of plants and animals consumed by outstation communities. Ecological surveys and studies of the area are limited and tend to concentrate on single taxa, such as crocodiles, or are a broad overview or classification of Top End wetlands (eg. Messel *et al.*, 1979, Messel *et al.*, 1981, Wilson and Brocklehurst, 1990).

Studies in progress include the distribution and abundance of trepang, and the use of Geographic Information Systems (GIS) to gather information on wetland use and crocodile nest distribution. Limited aquatic macroinvertebrate, fish and plant surveys have been undertaken and will continue.

To address the need of greater understanding of the wetland's processes and characteristics, a field laboratory, overlooking the Liverpool River floodplain, has been built for visiting scientists use. A herbarium is planned for the near future to contain specimens of useful plants, these will include food, medicinal and commercially valuable plants.

The BAC invited *eriss* and other organisations to become involve in the management planning process to help create a sound future for their wetlands. *eriss*' role has been to conduct baseline studies and gather relevant information which will contribute to creating the best possible management plan for the Djelk people and their wetlands. Participation in this process has helped *eriss* focus on providing better communication and more relevant service to major stakeholders in the environment, the Aboriginal people.

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