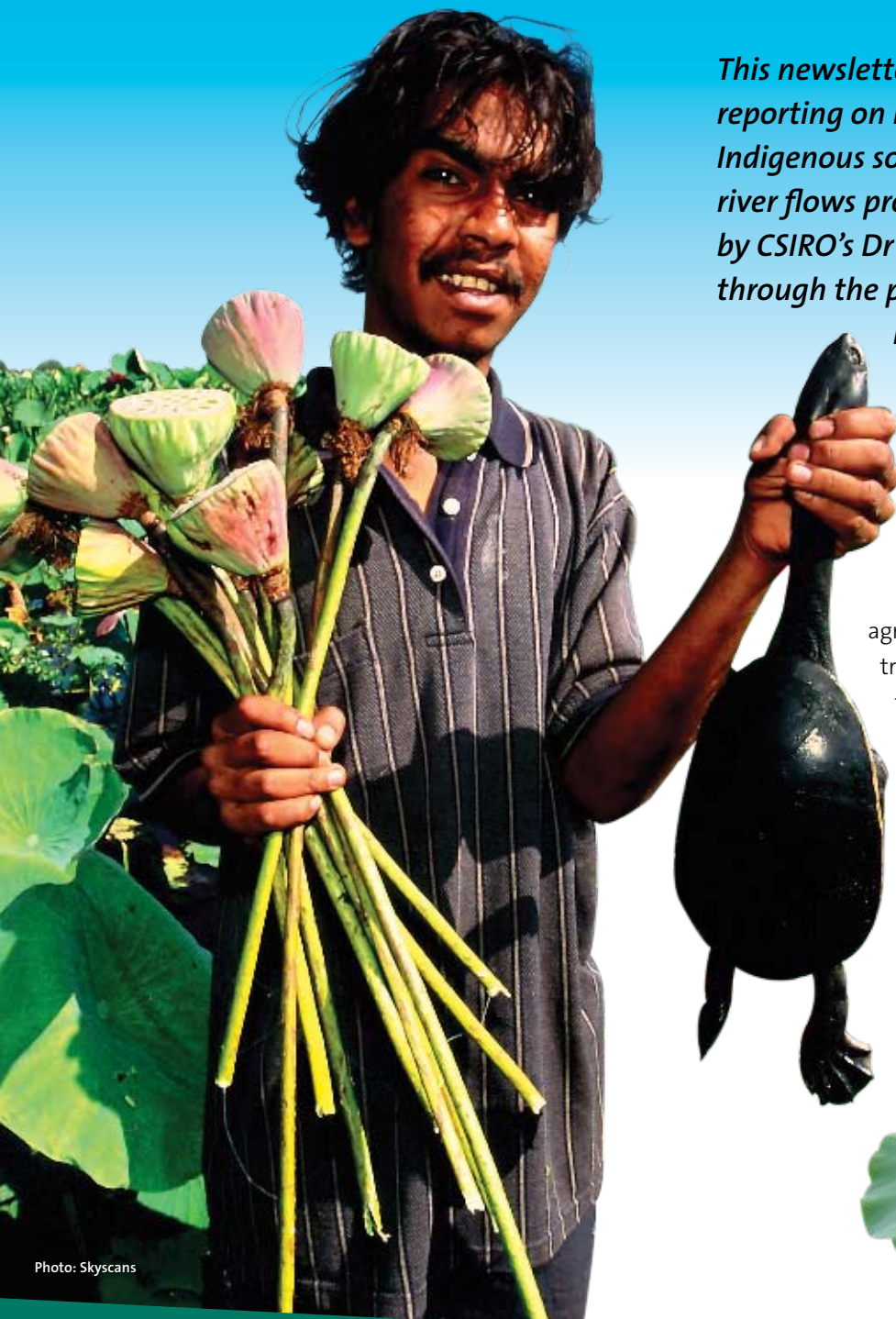


# Indigenous socio-economic values and river flows

Project 2.2 – Newsletter no. 1 | August 2009



*This newsletter is the first in a series reporting on research progress in the TRaCK Indigenous socio-economic values and river flows project. The research team, led by CSIRO's Dr Sue Jackson, is now half way through the project and has the following results to present.*

Australia's tropical rivers account for about 70% of Australia's total runoff. With water becoming an increasingly valuable resource in southern Australia, there is growing interest in water in the north, particularly for irrigated agriculture. There is also recognition that tropical river systems sustain important fisheries, and underpin other natural and cultural assets valued by society. If we are to ensure that greater use of water in north Australia is sustainable, then water planners and land managers will need good information on our tropical river systems – how they work and how people value and use them.



Photo: Skyscans



Australian Government  
Department of the Environment,  
Water, Heritage and the Arts  
Land & Water Australia  
National Water Commission



**TRaCK – Research to support river and estuary management in northern Australia**

TRaCK brings together leading tropical river researchers and managers from Charles Darwin University, Griffith University, University of Western Australia, CSIRO, James Cook University, Australian National University, Geoscience Australia, Environmental Research Institute of the Supervising Scientist, Australian Institute of Marine Science, North Australia Indigenous Land and Sea Management Alliance, and the Governments of Queensland, Northern Territory and Western Australia.

Indigenous people value rivers in a number of inter-related ways; they provide bush foods and medicines, they are part of a culturally significant landscape and have the potential to sustain future water-related businesses and employment. Currently, Indigenous values associated with rivers tend to be poorly understood by decision-makers, and some are difficult to relate explicitly to particular river flow patterns and to address in water allocation decisions.

The research team is recording Indigenous knowledge relating to water and quantifying the economic benefit to Indigenous people from water-dependent resource use in two TRaCK focal catchments – the Daly (NT) and Fitzroy (WA).

Development of a participatory monitoring program with Indigenous communities in the Daly and Fitzroy is underway and will

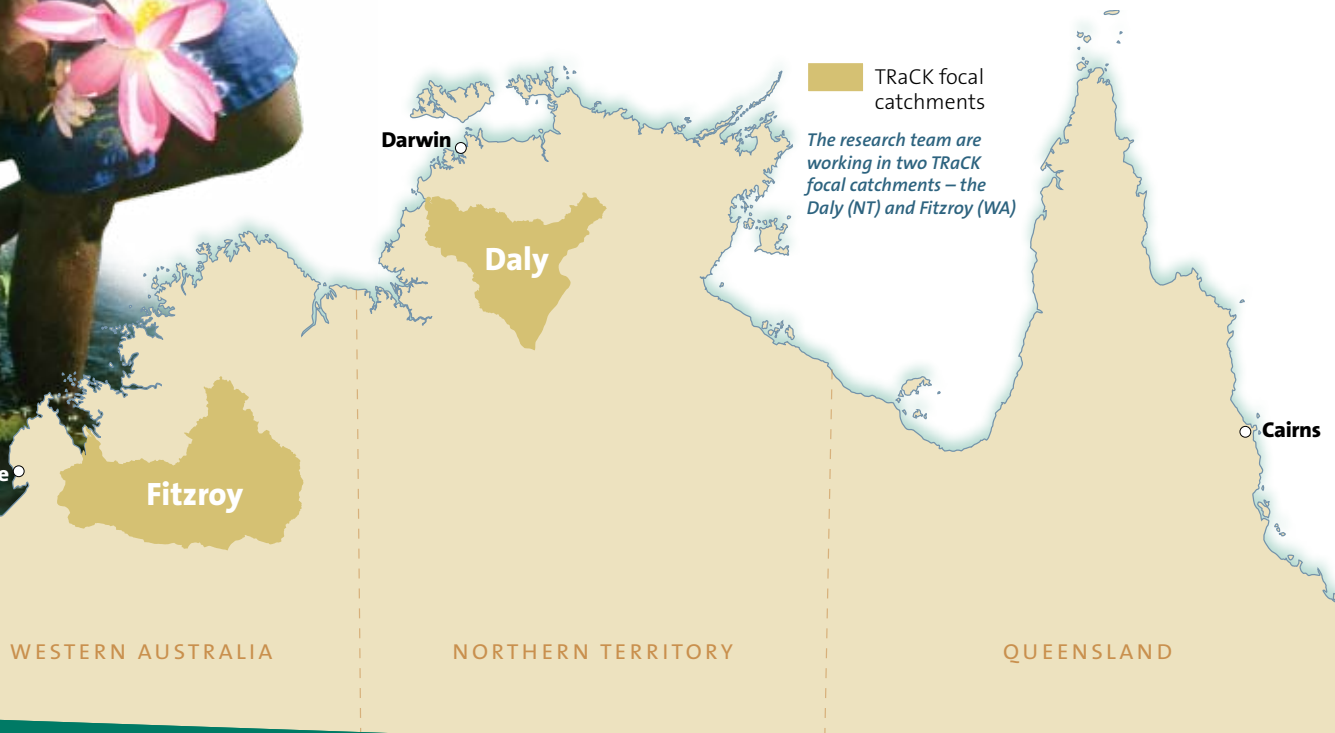
develop indicators to monitor outcomes for water management plans. In the latter stages of the project, the research team, in collaboration with other TRaCK researchers, will assess the impacts of altered flow regimes on patterns of Indigenous resource use and recommend ways of maintaining valued patterns and relationships to tropical river systems. The project will finish in 2010.

### Project aims

1. Document the significance of water and river systems (including groundwater) to Indigenous communities, particularly to Indigenous belief systems and environmental philosophy.
2. Quantify the direct economic value derived from Indigenous use of wild resources found in or reliant upon rivers and wetlands.
3. Assess the impacts of changes to flow regime on Indigenous communities, and
4. Collaborate with Indigenous land management agencies to develop and trial a participatory monitoring program for flow regime changes and wild resource use.



Photo: Skyscans



## How are we doing this research?

The project has a number of stages that, when combined, will generate results useful to water managers. Approaches that were attractive to Indigenous research participants were selected. The methods and stages are shown in the diagram below:

### Stage 1: Resource and values assessment

- Culture mapping
- Qualitative social research
- Household surveys

(Year 1-2)

### Stage 2: Economic valuation

- Quantification of harvest (# and weight)
- Calculation of replacement value

(Year 2-3)

### Stage 3: Impact assessment

- Modelling of flow regimes, and potential flow alterations
- Assessment of impact and cost to Indigenous livelihood
- Social and cultural impacts of flow alteration

(Year 3)

The project is currently between Stage 1 – Resource and Values Assessment and Stage 2 – Economic Valuation.

These two stages have seen us undertake the following activities:

#### 1. River use mapping that gathers data on the spatial and temporal distribution of Aboriginal resource use today and in the past

This information is gathered using Participatory Rural Appraisal (PRA) sessions with groups of a practical size. Information collected during the PRA process is being used to:

- construct seasonal calendars that record Indigenous ecological knowledge on seasonal change and assists researchers understand when specific species are available or are targeted by Indigenous people; and
- create maps of the spatial distribution of resource use to help understand which habitats are most commonly used and how river flows (particularly flooding and drying cycles) might affect those habitats. This will be important to Stage 3 – Impact Assessment.

*Fitzroy River, Western Australia*



## 2. Household surveys that quantify the harvest and consumption of aquatic resources.

Surveys are implemented during a semi-structured interview, with participants being asked to recall a period of hunting activity over the preceding 2 weeks. Interviews are repeated twice in a month to allow for longer temporal coverage (i.e. 1 month) while reducing the overall recall period (i.e. 2 weeks). The monthly surveys are being conducted quarterly for 2 years to provide information on the seasonal and inter-annual variability of resource use.

The quantitative component of this project focuses on the direct-use of water dependant resources (i.e. the harvest and use of plants and animals for bush foods). While the direct use of water dependant species is the easiest value to quantify, it is a lower bound value and needs to be placed in the context of cultural and social importance and relationships with water. The social research we are conducting will contribute to wider understanding of this context to the rest of the TRaCK program, land and water managers and the wider public.

## 3. Social and cultural studies of Indigenous values

In collaboration with participating communities in the Daly and Fitzroy regions we have identified a range of research activities and methodologies to reveal the social and cultural value of river systems. These include documentation of local social histories and cultural knowledge, community artworks, seasonal calendars, river mapping, and a photography project with school children and community members that will culminate in a photo exhibition. This effort will contribute to a fuller understanding of the social impact of water use changes.

Once we have completed the assessment and valuation phases (by mid-2010), we will turn to the last stage of the project: assessing the Indigenous socio-economic impacts of altered flow regimes.

From October, the project team will commence a year long trial of a monitoring program to generate and test some Indigenous indicators of healthy river country. Indigenous partners in our research have expressed a strong interest in being involved in monitoring of the health of their country. However, scientific indicators of river and wetland health are not always readily aligned with Indigenous



*CSIRO's Emma Woodward (right) collecting food resources with Molly Yawulminy in the Daly River region*



relationships to water, so this component will generate a list of indicators in partnership with participants. Support will then be provided to construct a 12 month monitoring program using these indicators. The monitoring trial will inform approaches to including Indigenous people and their values in water plan monitoring and evaluation.



*Daly Wetland, Northern Territory*

## Who are we working with?

In the Daly River region the project team is working with the communities of Kybrook Farm & Pine Creek and Nauiyu Nambiyu (Daly River). In the Fitzroy Valley of the Kimberley, residents from the communities of Bayulu, Bungardi, Darlgunya, Junjuwa, Ngurtuwarta, Muladja and Noonkanbah have been engaged along the Fitzroy River. Representatives from a number of language groups are involved in the research and include Ngan'gi, Malak Malak and Wagiman speakers from the Daly region and Bunuba, Gooniyandi, Walmajarri and Nyikina-Mangala speakers from the Fitzroy region.

We work closely with our project Steering Committee which includes representatives and specialists from the Northern Territory's Department of Natural Resources, Environment, the Arts and Sport, the Western Australian Department of Water, the Australian National University, the University of Western Australia and CSIRO, and seek to keep our local and regional stakeholders regularly updated through our e-newsletters.



*CSIRO's Emma Woodward with Helen Malo (at the table) and residents of the Muladja community in the Kimberley*



*CSIRO's Marcus Finn working with Roderick Andrews from the Junjuwa community in the Kimberley*



## What have we found so far?

### Economic surveys

Of the eight household surveys planned in each of the study catchments, three have been completed in the Daly River catchment and two have been completed in the Fitzroy River catchment. Although a full year of



data has not been gathered in either catchment, preliminary analysis suggests different habitats are targeted for harvesting at different times of the year (**Figures 1 & 2**).

### Daly River Catchment

In the Daly River catchment, billabongs were most often visited in the late Dry Season 2008, before effort shifted to flooded creeks and other floodwaters in the late Wet Season. In the mid dry season effort was relatively well spread across the main river channel, billabongs and creeks (**Figure 1**).

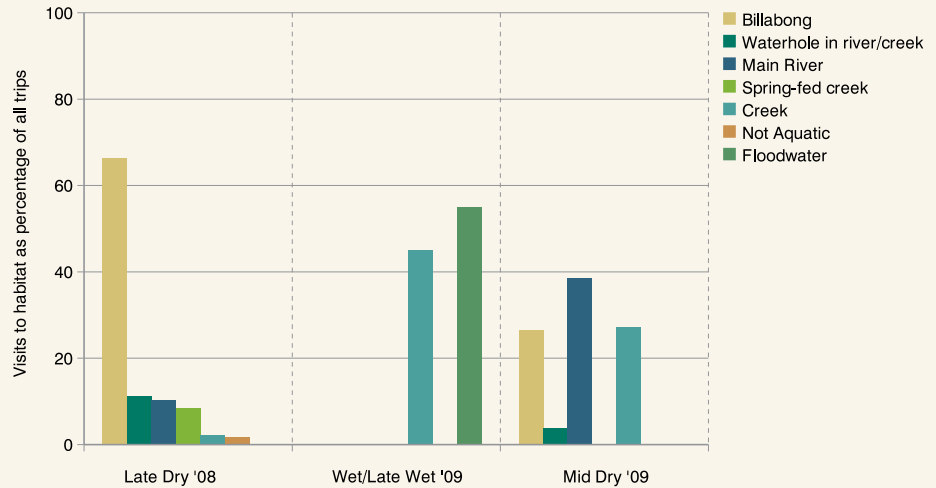
### Fitzroy River Catchment

Habitat use was more consistent in the Fitzroy River catchment, with the main river channel and billabongs dominating use in the late Wet Season and mid Dry Season 2009. Creeks and river-creek junctions became less utilised in the mid Dry Season as these habitats began to dry (**Figure 2**).

Knowledge of the main habitats being used may help identify flows that will ensure Indigenous access to these habitats is maintained.



**Figure 1:** Habitats visited – as a percentage of all trips undertaken by Aboriginal people in the Daly River catchment, NT



**Figure 2:** Habitats visited – as a percentage of all trips undertaken by Aboriginal people in the Fitzroy River catchment, WA.

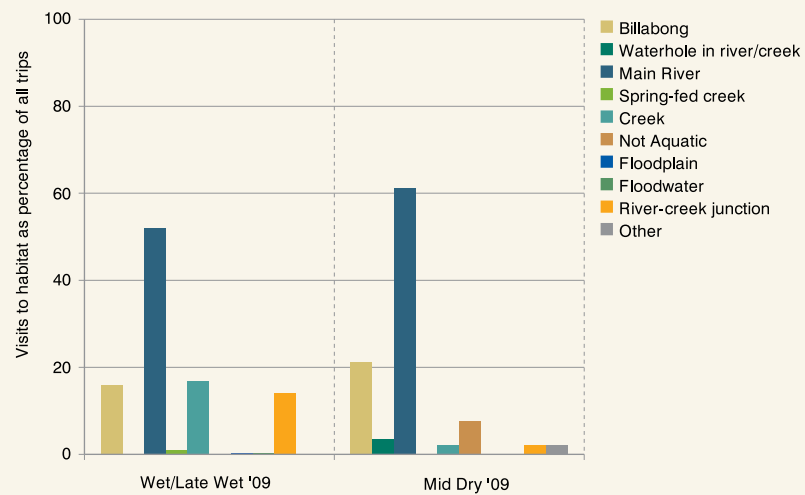
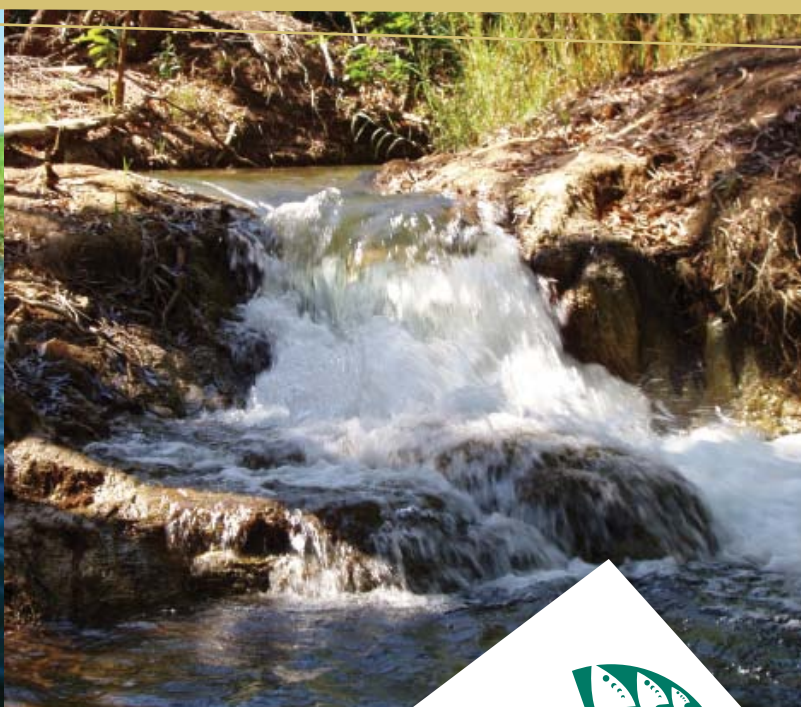


Photo: Skyscans



## What's being harvested?

The plant and animal species being harvested in the greatest numbers is different between the two study catchments.

## Results from the late Dry Season 2008

### **Black Bream**

were caught on 13% of food gathering trips

### **Barramundi**

were caught on 6% of food gathering trips

### **Magpie Geese**

were collected on 33% of food gathering trips

### **Long-necked Turtles**

were caught on 24% of food gathering trips

### **Lotus Lilies**

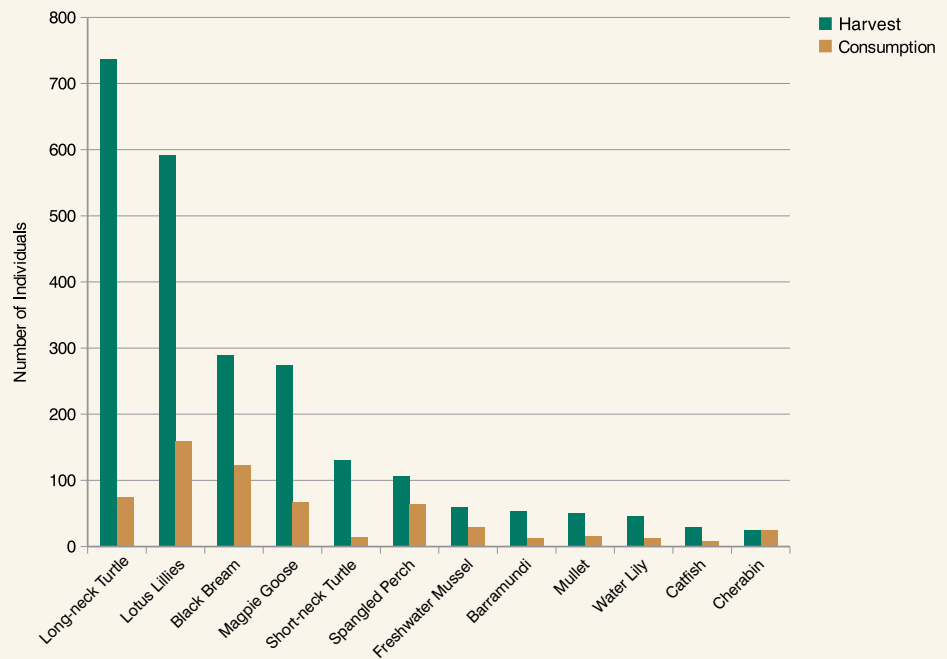
were collected on 24% of food gathering trips





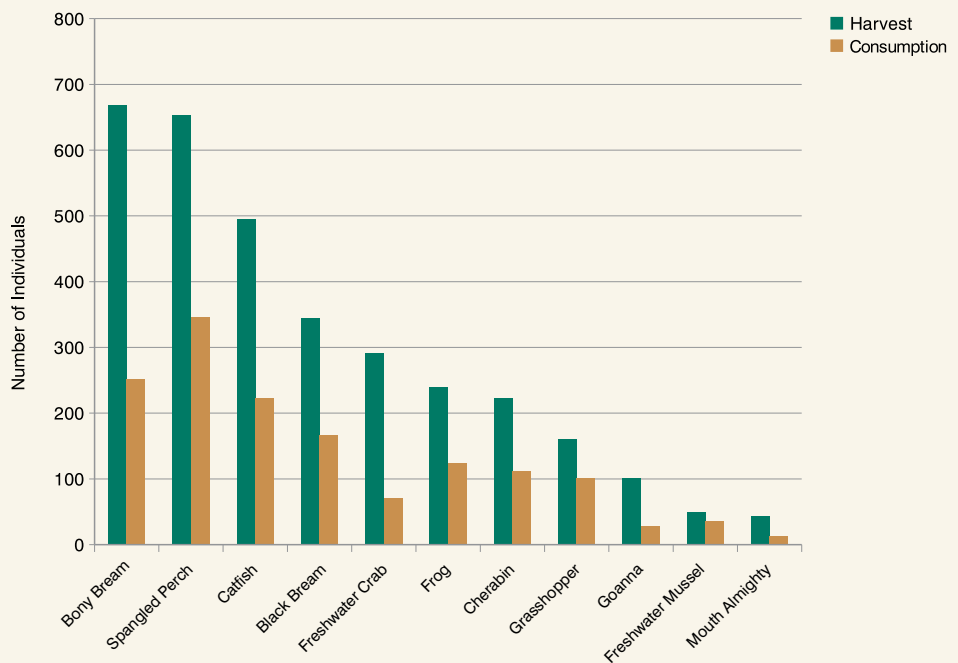
**Figure 3:** Total number of individual plant and animals harvested on trips attended by survey households, and number of individuals consumed by survey households in the Daly River catchment, NT.

In the Daly River, Long-neck Turtles (*Macrochelodina rugosa*), Lotus Lilies (*Nelumbo nucifera*), Black Bream (*Hephaestus fuliginosus*), Magpie Geese (*Anseranas semipalmata*) and Short-neck Turtles (*Emydura* spp.) are the five species harvested in the greatest numbers.



**Figure 4:** Total number of individual plant and animals harvested on trips attended by survey households and number of individuals consumed by survey households in the Fitzroy River catchment, WA.

In the Fitzroy River, Bony Bream (*Nematalosa erebi*), Spangled Perch (*Leiopotherapon unicolor*), Catfish (*Arius* spp.), Black Bream and Freshwater Crabs (*Holthusiana transversa*) are the species harvested in the greatest numbers.



Household consumption of these species follows a similar pattern but is substantially lower than the number of individuals being harvested.

Consumption of plants and animals by survey households is lower than production because a number of families often participate in harvesting trips and share the catch amongst themselves and other families. In particular, Magpie Geese (*A. semipalmata*) and Long-neck Turtles (*M. rugosa*) are harvested by a smaller number of households and shared or traded extensively with family, friends and others in surrounding communities.

Knowledge of the species most commonly harvested and consumed by Indigenous people may answer the question: is there a different list of “important” species to those understood to be important by other riverine stakeholders. If so, we will then be in a position to focus research attention on the potential list of species that will require maintenance flows to ensure their populations do not decline should there be changes to water use and flow in the future.

## Recording Indigenous knowledge

The project team has been working intensively with the Nauiyu community within the Daly River. Intensive discussions about fishing and hunting with

expert members of this community resulted in the compilation and production of the Ngan’gi language seasonal calendar. The product emerged as a result of the desire by members of the group to see Ngan’gi ecological knowledge recorded in a way that might act as an educational tool for young children.

The poster contains information about 13 different seasons, the resources collected from rivers and billabongs at different times of the year, and the ecological indicators that are used to determine the optimal time for seeking specific plants and animals. The poster was launched at the 2009 Merrepen Arts festival in May at Daly River and will be displayed and used at local schools and education institutions.

The research team has also started the process of developing seasonal calendars with two other language groups; Malak Malak (Daly River) and Gooniyandi (Fitzroy River). Stories about the Daly River have been collected from Malak Malak, Ngna’gi and Wagiman speakers and show a rich and diverse history of river use, while detailed river and resource use mapping, conducted with over 50 participants in the Daly and Fitzroy River regions, has shown a very detailed and localised knowledge of place, including that related to cultural and spiritual connection to water, resource use, flow characteristics and spatial and temporal change.



Daly River, Northern Territory



CSIRO’s Emma Woodward working on the Ngan’gi Seasonal Calendar at Nauiyu Nambiyu.



The Naiyu – Daly River seasonal calendar was distributed as A1 and A2 posters at the Merrepen Arts Festival. A large format vinyl banner was also produced (below).



## Where to from here?

Two community art projects involving traditional owners, residents, schools, and the Merrepen arts centre at Nauiyu (Daly River) are planned for 2010.

1. Using photography to identify social and cultural values attributed to the Daly River and to then hold a photography exhibition.
2. Facilitating the exchange of traditional ecological knowledge and western scientific knowledge of river ecology, habitats and river flows through a community art project that brings together elders, school children and TRaCK researchers.

The household economic surveys will continue throughout this year and 2010. The research team are currently finalising the monitoring program, which will start in October, with a number of Aboriginal groups, including the Wagiman Rangers, Malak Malak Rangers, groups from Noonkanbah and upstream communities in the Fitzroy Valley in the Kimberley.



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