

Newsletter Wet Notes

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The Ministry of Environment's Pakistan Wetlands Programme

The monthly newsletter of the Pakistan Wetlands Programme (PWP) is published to inform donors, scientists, academics, researchers, environmentalists and environmentally concerned individuals of all qualifications and ages about the Programme, its projects and upcoming events while giving insights and updates on research, education, and habitat management activities. The PWP's objective is to conserve the globally important wetlands biodiversity in Pakistan while alleviating poverty. It is a progressive initiative of the Federal Ministry of Environment and is being implemented by the World Wide Fund for Nature, Pakistan (WWF P). It is funded by a consortium of national and international donors including, the Global Environment Facility (GEF), United Nations Development Programme (UNDP), the Royal Netherlands Embassy (RNE), WWF Global Network and the Pakistan Poverty Alleviation Fund (PPAF).

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PWP's Indus River research boat.

"Nothing Slips By"

Programme Updates

» What's up in the Alpine Region?

Visit to Jan Fish Farm in Ghizer District

A team from the Regional Operations Base at the Northern Alpine Wetlands Complex visited the Jan Fish Farm in Singal Village, Ghizer District in late February, 2008. The fish farm is property of the *Sunshine Educational Welfare Society* which is involved in several ventures for the uplift of the local community. Rehmat Jan, Director of SEWS, explained how part of the income generated from the marketing of fish is used to provide education to the needy students of Zameer Public Secondary School in Singal. He said that SEWS supported the efforts of the PWP to conserve the wetlands of the country and offered to work with the Programme in future awareness-raising activities in the area.

Training in Livestock Management

Due to their geographical isolation and lack of access to alternate livelihood options, communities living in the remote mountainous areas of Broghil Valley are heavily dependent on their livestock for income-generation. Recognising this, the NAWC arranged for a training course in basic husbandry practices for the local herders of the Broghil Valley wetlands. This will be followed by a livestock vaccination campaign.

World Water Day celebrated in Ishkoman Valley, Ghizer

To celebrate the World Water Day 2008, a quiz competition was organised by the PWP's Northern Alpine Wetlands Team and *Saving Wetlands Sky-high Project* of WWF-P for the students of selected schools in Ghizer District's Ishkoman Valley.

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Judges at World Water Day Quiz competition.

The objective of this event was to raise awareness about the significance of high-altitude wetlands and highlight the role of the PWP in conserving the biodiversity of these wetlands. In addition, the quiz competition drew attention to the value of access to clean water for human well-being and the importance of ensuring that adequate sanitation facilities are provided to all parts of the region. In the opening ceremony of the quiz competition, Dr. Humaira Khan, the Programme's Regional Wetlands Specialist, introduced the PWP: its aims, objectives and activities. This was followed by the quiz competition which focussed on various environmental issues and wetland-related topics. A total of sixteen students participated in the competition. Sabit Rahim, Head Master of F.G. Boys High School, Mominabad, was the Chief Guest at the occasion.

Training for Eco-guides and Porters

The NAWC organised and presented a fifteen-day training course for the Eco-Guides and Porters of the Broghil Valley Community. The



Guides learn a new technique for descending.

training was conducted by the *Adventure Foundation, Pakistan*, at their training base in Mangal, Mansehra, from February 28th to March 13th, 2008 and a total of eleven trainees from the Broghil Valley participated in the event.

Training on Poverty Alleviation through Micro-Finance

The Social Organiser of the NAWC attended a Training of Trainers Workshop titled *Poverty Alleviation through Micro-finance*, organised



Group photograph of participants.

by the Ministry of Local Government and Rural Development. The workshop was held in Islamabad from March 17th to 20th, 2008 and its



View of the workshop.

aim was to familiarise the participants with alternate livelihood options for the less-privileged members of the community.

Learning the skills of Stove-making and Repair

Last winter, the PWP distributed fuel-efficient stoves to the local inhabitants of the Broghil Community in an attempt to reduce



Youth beats out a new stove.

the pressure on the peat lands that are the principal source of domestic fuel. With the passage of time, these fuel-efficient stoves require some maintenance and repair. To address this problem, meetings were arranged with stove-makers from the local area and it was decided to train the local craftsmen and metal-workers in various techniques of stove manufacture and repair. Training of stove making form will enhance the skills of the local community while providing them an alternate source of income-generation.

SWOT Analysis of the Chiantar Welfare Society of Broghil

The CWSB is doing commendable work for the conservation and management of wetlands and other natural resources in Broghil and for the uplift of the Wakhi Community in general. As a first step towards building the capacity of the organisation, the PWP conducted a detailed analysis of the CWSB's strengths, weaknesses, opportunities and threats to pin point areas that need improvement



Eco-guides on a training expedition.

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and explore opportunities for growth.

Discussing the feasibility of a small Hydro-electric Plant for Broghil

Lack of access to alternate sources of energy is one of the main reasons for the degradation of natural resources in the District of Chitral in general and the Broghil Valley in particular. Local community members in the Broghil Valley usually meet their domestic energy requirements from either peat or what ever little wood may be gleaned from dwindling nearby forests.

In order to reduce this mounting pressure on the natural resources of the area, the PWP is exploring the possibility of establishing a micro-hydro-electric power plant in the Broghil Valley. A meeting was arranged with the *Agha Khan Rural Support Programme* and a private organisation called *Alternative Green Power* to discuss the feasibility of the project. These initial discussions were instrumental in formulating a draft proposal and preparing preliminary budgets for the proposed power station. Besides this, various other areas of mutual co-operation were discussed with the *AKRSP*, including the viability of installing solar water heating systems in the households of Broghil.

What's flowing near Makran coast?

Students Visit Coastal Wetlands Complex

Students from various schools of Gwadar were invited to visit the Makran Coastal Wetlands Complex



Students enjoying their field trip to the coastal wetlands.

Site Office. The purpose of the visit was to apprise the students about the various issues and problems of



Students display their findings from the coast.

coastal wetlands including pollution by coastal inhabitants, over-exploitation of resources, biodiversity loss and so on. The communities inhabiting the Makran Coast are largely dependent on wetland resources for their livelihoods and it is imperative that these resources should be used wisely. The visiting students were provided information about these resources as well as the important animal species that live in and near the ocean. The contribution of the PWP and interventions by the



Students are given a briefing about mangroves.

MCWC Site Office for conservation of coastal and marine life at Makran Coast was also discussed.

Workshop on the Importance of Coral Reefs

Coral reefs are important marine ecosystems, providing a source of food and income for millions of people around the globe. Unfortunately, they are extremely vulnerable to disturbances. In recent years, factors such as environmentally irresponsible fishing, pollution, coastal

development, sedimentation, scuba diving, predator outbreaks, growth of invasive species, epidemic diseases, climate change, etc. have acted synergistically to degrade coral health and induce the so-called bleaching of corals.



Describing the growth of a coral.

To provide basic information about corals and related conservation issues, a workshop was organised by the Programme at Makran Coastal Wetlands Complex (MCWC) Site Office. The workshop was attended by representatives from government departments, NGOs as well as fisher-folk and members of the local communities of Ormara, Jiwani, Pasni, Pishkan and Gwadar.

Abdul Rahim, Site Manager of the MCWC, represented the PWP. He introduced the coral reefs and discussed their importance as a vital ecosystem. He explained the various threats being faced by reefs in general and the reefs off the

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Makran Coast in particular. Interventions introduced by the PWP for coral conservation such as coral-safe anchoring, clean-up operations and research programmes were also elaborated upon.

Asghar Shah was the principal resource person at the workshop. He presented his point of view about the effectiveness of various coral reef conservation strategies. He stressed a joint effort between the neighbouring countries of Pakistan, Oman and Iran for successful implementation of these conservation efforts.



Participants group photograph.

consultations with these local organisations. It was suggested that Village Conservation Committees (VCCs) be constituted in the significant wetland areas and that these institutions would undertake a threat analysis to identify the links between resource use practices and wetlands



Community members sharing ideas.

Bringing the Community together for Conservation

The PWP has initiated a process of social mobilisation targeting the communities living in the vicinity of coastal wetlands. The aim of this part of the Programme is to promote community participation in the sustainable use of fresh-water and marine wetland resources and their associated biodiversity. In this regard, a workshop was organised at Jiwani by the MCWC staff members and was attended by members of the local communities, NGOs, CBOs, and officials from the local district government.

Javaid Sameen, the Social Organiser of MCWC, gave a brief introduction to the significance of the wetlands and the role of the PWP in protecting these unique ecosystems. He emphasised the importance of the local CBOs in wetlands conservation and highlighted that all community level interventions would take place after

degradation. The VCCs, consisting of a network of local Community-based Organisations would be responsible for planning, implementing and managing the sustainable utilisation of wetland resources in their region. Besides this, the VCCs would also address ways of enhancing the income of

the local communities and introducing alternative means of income generation so as to reduce the pressure on the wetlands.

As associate professor of the Karachi University's Zoology Department, Karim Gabol, spoke about the globally significant species of the Jiwani wetlands such as the endangered Green Turtle, Marsh Crocodile, migratory birds, wide range of cetaceans, corals and mangrove forests. Professor Gabol focused his speech on the local population of District Gwadar who are largely dependent on fishing related activities for their livelihoods, making it imperative that they conserve these wetlands resources.

The Union Council Nazim was the chief guest at the workshop. He concluded the seminar by offering his personal support as well as all possible assistance from the District Government for the activities of the PWP. He encouraged members of the local community to become involved in environmental protection and praised the idea of forming Village Conservation Committees.

Involving Academia in Wetlands Conservation

An introductory seminar was organised by the MCWC Site Office for the principals and senior teachers of selected schools in Gwadar. Marriyum Aurangzeb, Co-ordinator Awareness-raising, elaborated on the role of the PWP in protecting the biodiversity of the



Some of the female teachers with Marriyum Aurangzeb.

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Makran Coastal Wetlands and explained that Wetlands Nature Clubs would be established in schools to educate students about the interdependence of humans and wetland resources. This would encourage them to become involved in events and activities for the protection of the environment, especially the wetlands in their vicinity.

Abdul Ghaffar, District Naib Nazim, was the chief guest at the seminar and he applauded the efforts of the PWP for involving the teaching professionals in wetlands conservation. He thanked the PWP for introducing such activities in schools and offered his full co-operation and support.

Involving the Media

Journalists from the print and electronic media were invited to attend an introductory meeting for the formation of a Wetlands Press Club in Gwadar. The meeting was arranged by the MCWC staff at the Gwadar Press Club and was attended by more than twenty-five journalists. Marriyum Aurangzeb, the Programme's Coordinator, Communications and Awareness-raising introduced the aims and activities of the PWP. She praised the efforts of the media in raising environmental awareness and elaborated how they could play a vital role in increasing know-how among the general public about the wise-use of wetland resources. She briefed the participants about the formation of a Wetlands Press Club and its objective of apprising media personnel about current issues related to wetlands in Pakistan. Marriyum also mentioned that the PWP plans to create a wetlands information corner at the Press Club and that the Programme could organise a photographic course for journalists.

World Water Day celebrated at MCWC

The PWP, in collaboration with the *Pakistan Fisher Folk Forum* celebrated the World Water Day on March 22nd at RCDC Gwadar Club by organising a workshop on the global theme for this year:

International Year of Sanitation. The World Water Day is celebrated worldwide to promote activities related to the conservation and wise-use of this life-giving resource. An estimated 1 billion people



Speaking on the significance of water and hygiene. around the world lack access to clean, safe drinking water and more than 2.6 billion lack adequate sanitation facilities. Basic sanitation



Sharing ideas on water management.

some under-privileged communities. Every year thousands of children die from diarrhoea and related waterborne diseases because of the unavailability of safe and clean drinking water.

In Gwadar, rapid industrial growth and developmental activities are exacerbating the problems of



Guests and PWP's team members listening to the speeches.

includes access to facilities for the safe disposal of human waste and the ability to maintain hygienic conditions through services such as garbage collection, industrial or hazardous waste management and waste water disposal. All of the above are issues that affect Pakistan's Coastal Communities in particular.

The workshop organised by the MCWC Site Office discussed the above-mentioned issues with a focus on the problems of Pakistan. Pakistan has the world's 7th largest water reservoirs yet the lack of proper waste management systems and unequal distribution of water resources has resulted in a shortage of water, especially for

pollution, solid waste management and access to clean drinking water. The participants of the workshop discussed ways and means of



Members of the press at World Water Day 2008.

alleviating these problems with support from the government, NGOs and members of the local community.

Technical Innovations ("Cool stuff") Four-Stroke Outboard Motors - The Environmentally Friendly Option

The PWP's field survey activities are currently in full swing. These activities often involve surveying the rivers, lakes, ponds and even marine areas and the open sea by

ago. It was, however, not until the environmental awareness revolution in the 1970's that motor manufacturing companies started to pay more attention towards reducing the negative environmental impact of outboard motors which were typically very inefficient and polluting. Four-stroke outboard motors are inherently more environmentally



The motors that power PWP's Boats.

boat to collect data such as water depth and velocity, water quality, species distribution and abundance. The PWP is dedicated to using environmentally friendly equipment in both its survey programmes and its offices and has therefore selected the most environmentally friendly outboard motors to power its survey boats. The first practical outboard motor was created by Norwegian-American inventor Ole Evinrude in 1909, almost a century

friendly than two-stroke outboard motors. Two-stroke engines run on a mixture of petrol and oil to protect moving parts within the motor, and introduce into the water a wide range of potentially toxic substances. The lubricating oil in four-stroke motors is confined inside the engine and does not mix with the fuel. Two-stroke outboards also emit a smoky exhaust containing unburnt oil, which, in turn pollutes, the water. It has been reported that water bodies where two-stroke

motors are regularly used, receive a high input of un-burnt oil and fuel emitted into the water through drainage points in the motor body. Moreover, the lubricating oils used



Motor mounted on trolley.

in two-stroke outboard motors aggregate in the water column and can produce visible slicks on the surface of water. On the other hand, four-stroke engines, although more expensive than two-strokes, produce less pollution, are less noisy, operate more smoothly and deliver better fuel economy with lower running costs!



Controls of the motor.

Four-stroke outboard motors are now manufactured by all the major outboard motor companies and are the most commonly used type of outboard in the Western World but they are not easily available in many parts of Asia and Africa. With such convincing environmental and cost-effective arguments for using four-stroke motors, however, the PWP has acquired several Yamaha® and Mercury Mariner® four-stroke outboard motors to power the boats. These motors were used very effectively in the recent large-scale Indus Dolphin expeditions on the Indus River and for the numerous Makran Coast and Astola Island surveys conducted during the past year.

When we use four stroke motors to survey Pakistan's wetlands, at least we can be assured, that our presence is not causing any damage to the very waters we are trying to conserve.

By: **Zafar Ali**, Research Officer, PWP

Formulating a National Wetlands Management Policy



Country heads Ali Habib, WWF, and Sohail Malik, IUCN, signing MOU's.

The *Pakistan Wetlands Action* plan, which was formulated in 2000, is considered to be the latest policy instrument dealing with wetlands conservation in the country. Although this document serves a useful interim role, it is wholly inadequate for comprehensive application. In the absence of a pragmatic and living policy framework, the existing national and site-level conservation efforts are likely to have little sustainable impact on the globally important wetlands and their associated biodiversity in Pakistan. It is for this reason that the Government of Pakistan and PWP aim to develop a *National Wetlands Management Policy* and promote training, capacity-building and awareness-raising for protection of the country's wetlands.

The International Union for the Conservation of Nature (IUCN) has formally been assigned the task of developing a *National Wetlands Management Policy*. In this regard, a team of IUCN-Pakistan consultants will undertake orientation visits to the following PWP demonstration sites: Salt Range Wetlands Complex; Central Indus Wetlands Complex; Northern Alpine Wetlands Complex; and Makran Coastal Wetlands Complex. These orientation visits will aim to:

- Enhance understanding about the wetlands in general and PWP's demonstration sites in particular;
- Help in understanding wetland

related problems and issues;

- Provide an opportunity to have formal and informal meetings with various stakeholders; and,
- Generally acquaint the policy team with on-ground realities.

The first among a series of these



Exchange of MOUs.

orientation visits were undertaken to SRWC and MCWC by an IUCN multi-disciplinary team comprising of Inam Ullah Khan, Rafiul Haq, Shehzad Ahmed and Sherazullah Baig.

The team arrived in SRWC on March 5th and remained in the field for two days. Visits were arranged to various wetland sites including Kallar Kahar, Khabbeki Lake, Jahlar Lake, Uchali Lake and Namal Lake. In addition to direct observations and surveys, the team members held meetings with local public sector officials, elected representatives and civil society stakeholders that allowed them to better understand the problems faced by the Salt Range wetlands and the communities.

The visit to MCWC was instrumental in identifying the issues faced by the fisher folk in the areas of Gwadar, Pasni and Jiwani. The communities

of these coastal areas are largely dependent on fishing for their livelihood and thus their activities have a substantial impact on the conservation of estuarine and marine wetland resources. Keeping in view this inter-dependence, the team made some suggestions for alleviating the problems of these important coastal communities and ensuring the wise-use of the wetland resources that they depend on. The IUCN team members also met with officials of the local government administration to understand the role of the local bodies in environmental protection. The recent boom in developmental activities in Gwadar is having a negative environmental impact and in a meeting with the Director General of the Gwadar Development Authority, the IUCN team members discussed ways of minimising this impact.

Intern's Corner



I joined the PWP shortly after my graduation from Punjab University in 2008. I found out about the Internship Programme of the PWP from a friend

and applied for a position in the Finance Department in line with my future ambition of a career in Finance and Accounting. I have been working with the PWP for the past two months and my responsibilities include bank reconciliation, file management, and expense claim verification, etc.

My work at the PWP has been instrumental in enhancing my capabilities and has given me the confidence to begin professional life. Interacting with fellow colleagues and senior staff members, I have not only gained important knowledge about the workings of finance and administrative issues, but also polished my communication and negotiation skills, which will undoubtedly help me in my future endeavours. I am thankful to the PWP for giving me this valuable learning opportunity.

By Omar Nisar

Teacher Training Workshop on Wetlands Awareness and Education



Participants watching a presentation on effective teaching.

As part of its awareness-raising activities, the PWP has taken up the initiative of training school teachers to increase their understanding of the importance of wetlands and their value to local communities.

A two-day teachers' training workshop on "Wetlands Awareness



Teachers discussing ideas as a group.

and Education" was organised at the Gilgit Conservation and Information Centre by the PWP's Regional Operations Base in Gilgit and the Department of National Awareness Raising. The workshop was held on March 25th and March 26th, 2008 and was attended by twenty-five teachers from the government schools of Ghizer, Gilgit, Astore and Skardu Districts. The main objective of the training workshop was to familiarise teachers with the concept of wetlands, the value of wetlands to humans, as well as the negative consequences of mismanaging wetland resources. The second objective was to train a group of teachers in the imparting of education about wetland-related issues to students as well as assist

in implementing future awareness-raising activities of the PWP in their respective schools. The resource persons for the workshop included Babar Khan from the WWF-P, Northern Areas, Dr. Humaira Khan, Regional Wetlands Specialist of the PWP and Darveish Ali, Deputy Director of the Northern Areas Department of Education.

On the first day of the workshop, besides learning about the importance of wetlands and the inter-relationship between healthy wetlands and healthy people, the participants discussed the role of the communities, specially the teachers and students in the protection and management of wetland resources. On the second day of the workshop, Marriyum Aurangzeb, the PWP's Coordinator,

Awareness-raising and Communications presented a slide show about the various wetlands in Pakistan, elaborating on the PWP's interventions in their conservation. Marriyum discussed with the teachers the establishment of Nature Clubs in local schools and their proposed conservation activities for the current year. It was



Chief guest presenting certificates.

decided that each school would conduct various activities at regular intervals throughout the year related to environment, biodiversity and conservation of wetland resources. For our part, the PWP will facilitate these activities and arrange student visits to appropriate locations in Pakistan.

Fida Hussain, Secretary Forests Northern Areas was the Chief Guest at the workshop. In his speech, he thanked the PWP for arranging this training opportunity for school teachers and urged the participating teachers to spread the message of environmental stewardship among students and members of the local community.

By **Dr. Humaira Khan** PWP, Regional Operations Base, Gilgit



Group Photograph of workshop participants.

A bird's-eye view of the Environment



GIS training course.

Training on the Principles and Applications of Conservation GIS

The PWP is in the process of establishing a national level Wetlands Inventory to map the



PWP team and trainers.

extent and characteristics of important wetlands in the country. An advanced level Geographic Information System Laboratory (GIS-Lab) has been setup in the office of the National Council for the Conservation of Wildlife which is part of the Ministry of Environment. The GIS' data inventory will be centrally accessible from this laboratory. A subset of the Pakistan Wetlands GIS will also be deployed at all six provincial and territorial Programme Partners - the government conservation agencies. The PWP aims to establish the use of GIS at the grassroots level, and has initiated a programme of training for selected professional staff members from relevant government and non-governmental conservation agencies in the use and applications of GIS.

Accordingly, a training programme on the *Principles and Applications of Conservation GIS* was held at NCCW GIS Laboratory from February 25th to 29th, 2008. The objective of the training was to coach the participants in the use of GIS, Global Positioning System receivers and remote sensing for the conservation of wildlife and protection of natural habitat. The training involved lectures, hands-on sessions and field exercises. In



Participants at Rawal Park.

addition, emphasis was given to the teaching of computer-aided techniques for data generation, management and analysis.

A total of 23 participants attended the training session. The class included representatives from Sindh Wildlife Department, Sindh Forest Department, Federally Administered Northern Areas Territory Forest, Parks and Wildlife Department, Azad Jammu and Kashmir Wildlife & Fisheries Department, Punjab Wildlife & Parks Department, NWFP Wildlife Department, NWFP Forest Management Centre, IUCN-

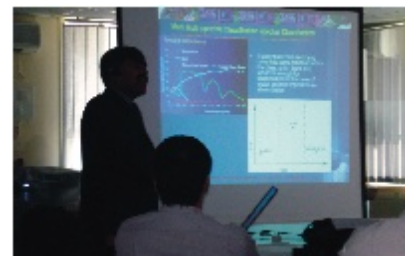
Islamabad, WWF-P and, of course, the Pakistan Wetlands Programme. During the five-day event, participants were trained in a wide range of GIS-related topics such as the basic concepts of GIS, scope and activities of Pakistan's Wetlands GIS, spatial data acquisition and management, digital image processing, forest mapping, and more. Insight was also provided



Fieldwork being conducted by participants.

into remote sensing and the Global Positioning System for satellite-based navigation as these high-tech tools are applied to modern conservation. On the fourth day of the training, a field visit was organised to Rawal Lake where the participants practiced determining their geographical position using GPS receivers – a technique called geo-referencing. They also collected vegetation data at geo-referenced sites for use in comparison with satellite images, a process called *ground truthing*.

By all accounts, the training course was very useful. It was recommended that such instructional sessions be carried out



Training session.

on a regular basis to promote the use of GIS and remote sensing in environmental management and enable capacity-building of professional staff of government and non-governmental environmental organisations.

Partner Pacts



Signing of MOU with CDD .

MoU signed with CDD, Gwadar

The PWP and the *Gwadar Community Development Department* (CDD) signed a Memorandum of Understanding to work hand-in-hand for managing and conserving the wetlands of the Makran Coast and their associated biodiversity.

The CDD has agreed to allocate a room each at Gwadar and Jiwani for

establishing a Wetlands Information Centre. Moreover, they have offered to provide logistical support for the PWP training courses and campaigns as well as to arrange venues for related activities, seminars, workshops, etc.

MoU signed with Oman Beach Restaurant

The Oman Beach Restaurant in Gwadar signed a letter of

agreement to collaborate with the PWP in protecting the wetlands, and stressing their importance to the local communities and visiting tourists.

Under the terms of agreement, the *Oman Beach Restaurant* will allot a particular site at their restaurant for a



Signing of MOU with owner Oman Beach Restaurant .

Wetlands Information Centre and offer necessary support during the events and campaigns of the PWP. In turn, the PWP will provide the relevant resource material for the information centre as well as design and fund all the material used during awareness-raising campaigns such as pamphlets, banners, waste bins, information posters, etc.

Other News

Indus for All Programme endeavours for establishing a strong institutional support basis



Signing of a MOU with L&FD.

Indus for All Programme and Livestock & Fisheries Department (L&FD), Government of Sindh, have signed a Memorandum of Understanding (MoU) for cooperation for natural resource conservation.

The MoU sets out the terms and conditions for the extension of a long-term technical and institutional

support for each other for the natural resource conservation in the Indus ecoregion under the Indus for All Programme. As per the MoU, WWF-P and L&FD will support each other to provide technical, logistic and institutional support in implementation of the activities under the Programme.

GIS Training for Partner Organizations

A training course on forest and natural resource management techniques through remote sensing technology was held at Hyderabad from 11-14 March 2008. The training entitling 'Natural Resource Management using Geographical Information System (GIS) and Satellite

Remote Sensing' was held at the GIS Lab of the Sindh Forest Department, Hyderabad. The course had been arranged jointly by WWF Pakistan/Indus for All Programme and Sindh Forest Department. GIS experts from the Indus for All Programme and WWF-Pakistan Head Office facilitated the training, which was attended by 18 officers from the Sindh Forest Department and WWF-Pakistan.



GIS training course.

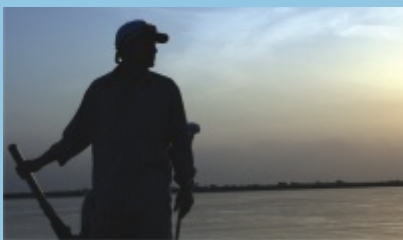
All Eyes on the Blind Indus Dolphins of NWFP



Team members returning with rations.

This spring, the PWP launched a large-scale scientific survey programme in the Central Indus Wetlands Complex in NWFP. The focus of the research was to investigate Indus River dolphin behaviour, habitat and communication with a view to prioritising sites that could become protected areas for the Indus dolphin in the future. The Indus dolphin is an *endemic species* in Indus River System, which is to say that it occurs nowhere else on earth and, sadly, it is one of the world's most threatened mammals. Dependent for its entire existence on the freshwater wetlands of the central Indus River, it is the highest priority species for the PWP's conservation efforts.

From January to March, 2008, the PWP team worked hand-in-hand with the NWFP Wildlife Department in Dera Ismael Khan District. A downstream dolphin survey was conducted from DI Khan to the Punjab border, covering 131 km during which 31 dolphins were



Albert Reichert steers the boat to camp.

sighted. Based on this information, the three sites which had the highest density of dolphins were selected for intensive study. A site near *Spur number 30* was studied

from January 20th to February 12th, one at *Kaheri Bund* from the March 2nd to 15th and finally a site at *Samookiwala* from March 16th to 26th. The expeditions were led by Gill Braulik, a PWP Research Fellow and Researcher from the University of St. Andrews, UK. There were more than 40 different participants



Modified local fishing boat.

throughout the course of the work including Albert Reichert, a river hydrologist and irrigation engineer from UN-Habitat, three District Forest Officers from NWFP Wildlife Department and numerous other wildlife and PWP staff.

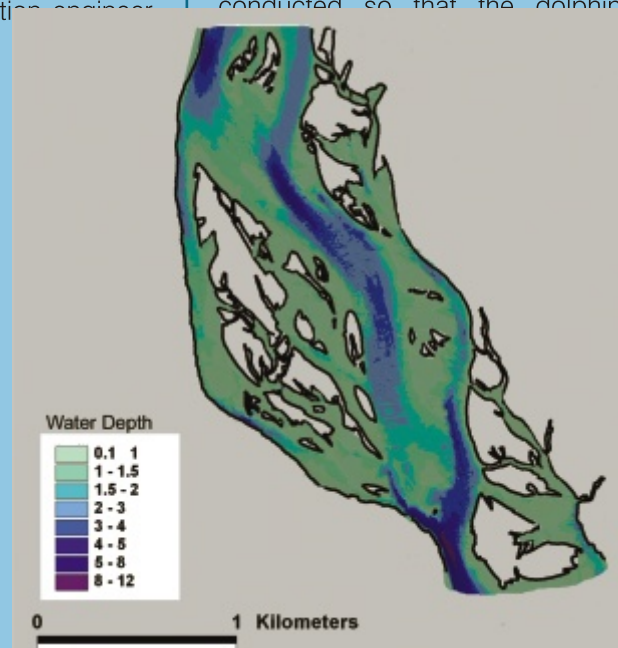
This was one of the most well equipped and technologically advanced expeditions that PWP has ever conducted. PWP and the University of St. Andrews provided several sophisticated instruments to study the dolphins. These included T-PODs that are used for

recording dolphin echolocation clicks, an underwater hydrophone for recording dolphin communication sounds, the Marsh McBirney Flow-Mate for determining water velocity, solar panels for charging equipment and a GPS integrated depth sounder for collecting georeferenced water depths.

Scientific Methods

Indus dolphins are not found evenly distributed throughout the Indus River. Instead they tend to concentrate in certain areas. Why they are found in some places but never in others was a question that we were keen to answer. In an attempt to do this, we conducted a study to understand the hydrological characteristics of preferred dolphin habitat. A very detailed depth map of each site was created by driving the boat and GPS receiver-depth sounder in zigzag transects at 5 m intervals across the site. Banks and islands were mapped on foot using hand-held GPS receiver – an exhausting task! An example of the very detailed depth map created at *Samookiwala* is shown below. A similar map of the current velocity in the river was also created.

Daily dolphin surveys were conducted so that the dolphin



Depth Map of Samookiwala, D.I Khan.

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groups could be located within the mapped area. When groups were sighted, a new method for locating the precise surfacing position of the dolphin was used: two observers sat more than 500 m apart on the river banks adjacent to a dolphin group and, using binoculars with an internal compass, simultaneously recorded the compass bearing to each dolphin surfacing. The Observers were in communication using two-way radios and data were recorded by an independent observer. The location of the observers was recorded by GPS and conventional triangulation was used to plot the 'exact location' of the dolphin onto the depth and velocity map in using a sophisticated software called ArcView®. More than 1,000 such plots of surfacings were carried out and the corresponding depth and velocity of these locations was recorded at Samokiwalla. These data will be



Using the depth sounder to locate Dolphin habitat.

processed and analysed using different multivariate spatial analysis tools to determine the depth and velocity preferences of the Indus dolphins in NWFP's portion of the Indus River.

A second component of the study was to test the reliability of the dolphin counts generated from normal river dolphin surveys. This was done through a variety of different experiments: 1. recording the time spent underwater of dolphin individuals and groups of different sizes; 2. recording the amount of time dolphins spent at the surface; 3. estimating dolphin group-size after observing for different lengths of time; and 4.



PWP team at Samokiwalla.

comparing dolphin counts from moving boats with those from stationary bank-based observation points. This accumulated information will now be integrated to help us understand whether boat-based surveys tend to under- or over-count the abundance of dolphins.



Team heading out for survey

Dolphins use SONAR, also called 'echolocation', for communication between individuals, to find food and to navigate. Two sophisticated and expensive instruments were used to record the underwater clicks that are emitted by the dolphins: the T-POD and a hydrophone. The T-POD has to be anchored securely in the river and it can then be left recording, day and night, for many months. Anchoring the T-POD in a river which has a rapid current, variable flow and which transports large quantities of floating debris is a considerable challenge and the T-PODs were frequently entangled in trees and reeds. Despite these constraints, however, they still managed to record dolphins very effectively.

Preliminary conclusions

These studies generated a significant amount of valuable data on Indus dolphin behaviour and habitat which will be carefully processed and analysed in the coming months. Although the final results will not be available for some time, the preliminary conclusions are as follows:

- Dolphins are rarely found in shallow water that is less than 1.5 m deep or in slow flowing water moving at less than 0.5 m/second.
- Dolphins are commonly seen at river channel confluences, where two or more than two channels of a river meet or at constrictions where the river narrows.
- Dolphins come to the surface for breathing every 30 seconds to 3 minutes and, on average, every 1 minute. Younger animals surface more frequently than adults.
- Dolphins spend less than a second at the surface.



Walking the edge with GPS to mark boundaries

It takes at least 3 minutes of observation to obtain a reliable estimate of the number of dolphins in a group.

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