

What's in a Wetland?

By LAURINDA KEYS LONG

It had been 22 years since Beth Middleton, an American wetlands specialist, had been in Keoladeo National Park at Bharatpur in Rajasthan, not since she spent four years there researching her Ph.D. dissertation. This April, she was back, with friends from the Keoladeo Naturalist's Association and the Tourism and Wildlife Association of India. Middleton was apprehensive that several years of drought had caused biodiversity losses.

But she made two discoveries which indicate that Indian wetlands can be preserved with help from those who live nearby and use them, and even the most sensitive native plants can withstand harsh conditions and still cling to life. Middleton said her short visits and observations are not enough on which to draw conclusions, and more monitoring and record-keeping are needed to determine whether changes in water supply to Keoladeo and other Indian wetlands are having irreversible effects. But she was mildly hopeful about her two serendipitous discoveries: a temple and a tiny flower.

Middleton had returned to India in 1991 as a Fulbright scholar studying ecology at G.B. Pant University, then in Uttar Pradesh, but had not visited Keoladeo since 1987. In April, she saw a lot of differences, some really positive. For example, the WWF has enlisted residents of nearby villages to rid the park of an invasive genus called *Prosopis* or mesquite, a hardwood, sugar producing tree that thrives in the arid soil from

For more information:

Water snowflake

<http://plants.usda.gov/java/profile?symbol=NYIN>

United States-India Educational Foundation

<http://www.usief.org.in/>

Keoladeo National Park

<http://whc.unesco.org/en/list/340>



Beth Middleton in Keoladeo examining mat sedge, used to make sleeping mats.

Mexico to South America. "When I was there in the '80s," Middleton said, "it had taken over many of the savanna areas and it was so thickly infested that I never went into these areas. It was simply impenetrable."

But she learned that villagers are now removing the trees in return for free wood to burn or sell. "What really struck me was when I went into the main gate and a little way down the road I

Many of these species have the ability to survive dry periods.



Nymphoides indica or water snowflake found in a pond at Keoladeo National Park.

said, 'What is that temple? Was there a new temple recently built?' They said it had been there for a long time, but I never knew it, nor did a lot of the Indians. Now there was a completely cleared path through the *Prosopis* to get to it. And as for the savanna, after they removed the *Prosopis*, it turns out that underneath this thick thatch of shrubs there are other native shrubs. So immediately they started to grow quickly, they are flowering, setting seeds, some of the grasses that are still there have been stimulated to grow."

The *Prosopis* have strong, deep roots. And

when they grow again, it will be awhile before their wood is attractive to the villagers. What then? That's the challenge for those in charge of India's national parks and biodiversity resources, she says. Maybe villagers would have to be paid to do the shrub removal. But she also noted that preservation of wetlands is in their interest. Wetlands not only provide water, and animal and plant life used for food and shelter, but organisms in wetland soil help to leach out pollutants, keeping it fertile.

Yet, Middleton says, the main problem for wetlands is not invasive species but hydrologic changes. A tropical, dry wetland like Bharatpur is meant to adapt to changes in water levels, she notes. But when large amounts of water are diverted for other uses the ecology becomes much more dependent on rain. After several years of drought, it rained this year. This was one of the reasons the Keoladeo Naturalist's Association wanted Middleton to come back "to get my advice about what species were still there and where." Many of these species have the ability to survive dry periods "so I looked back at my old notes and we went through block by block all over the place and noted where we had found species before."

And? "We found *Nymphoides indica*. It's called water snowflake, but it looks like a water lily, very small. It was encouraging because... I view it as being kind of a biodiversity indicator. It's one of the species that's always been a little bit rare. When local people who are accustomed to seeing it are saying, 'We are not seeing it, we are seeing species change in the park, can somebody come and help us figure out what's going on,' then it becomes a concern." 