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Community-based management of invasive *Prosopis juliflora* in Egypt

A guest article by Usama F.Ghazaly, Elba protectorate ranger, Egypt

ABOVE: Controlling mesquite with local community involvement

LEFT: *Prosopis juliflora* tree in Elba protected area

Mesquite *Prosopis juliflora* is the most serious invader in the south-east corner of Egypt. Introduced to the area by the local community of the Halaib region in the 1980s for agro-forestry and charcoaling purposes, it subsequently spread rapidly, especially after a period of heavy rain in 1996. The success of prosopis species as invaders is largely attributable to the massive number of seeds produced – about 60 million per hectare per year according to some references – and water plays a major role in their dispersal, particularly during floods.

On a more local scale, livestock also disperse the seeds after feeding on the pods. In this case, however, camels moving along the border between Egypt and Sudan helped spread the seeds over more than 1 000 km^2. Within this area there are three main prosopis populations, but most of the invaders are concentrated in the Halaib region.

The area of invasion falls within Egypt's largest and most important protected area, the Elba Protected Area (PA), which encompasses some 35 600 km^2. It contains an enormous variety of habitats and landscape features, ranging from coral reefs to mountain habitats, and supports a rich flora and fauna. There are at least 27 species of mammals, 38 species of reptiles and amphibians, and some 60 species of breeding birds. Furthermore, the region is situated on internationally important migration routes for soaring birds, in particular for birds of prey.

One of the most prominent features of the area is Gebel Elba (Elba Mountain). Due its closeness to the sea and its interception of moisture-laden north-east winds, Gebel Elba enjoys a higher precipitation than other Red Sea Mountains. The summit is a "mist oasis" where much of the precipitation is contributed in the form of dew, mist and clouds, creating a unique and rare ecosystem not found anywhere else in the country. Indeed, Gebel Elba is a "biodiversity hotspot", with a biological diversity unparalleled in any other terrestrial environment in Egypt. The relative abundance of moisture supports a diverse flora of some 458 plant species – almost 25% of plant species recorded for the entire country. Many Afrotropical elements have their northern limits at Gebel Elba, and the dense cover of acacias and other scrubs represents the only natural woodland in Egypt.

Prosopis poses a threat to the Elba PA's biodiversity, and negatively impacts ecosystem functioning and catchment hydrology. It has also had a secondary effect in that the dense thickets have displaced livestock, resulting in more intense grazing pressure in other parts of the protected area. The species has spread into all habitats, from salt marshes on the Red Sea coast in the east to desert plains in the west, and makes up about 40% of the plant community in the Halaib area.

A monitoring programme for prosopis was completed in 2004, after which the Elba PA's rangers embarked on a control programmme with the participation of the local community. To date, only mechanical methods have been used, the trees being felled and the rest of the stem and roots burned. Follow-up work is conducted and GIS techniques are used for continuous monitoring of the area of invasion. These control efforts are seen as a temporary solution, which will at least help conserve natural resources until the best way of exploiting this species within a sustainable and integrated management approach has been identified.