THE FIRE OF 1994 AND HERPETOFAUNA OF SOUTHERN ISABELA

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(Translated by K. Thalia East)

Between February and June 1994, Isabela Island experienced its fourth wild fire this century. Approximately 3,500 to 4,500 ha on the southwestern slopes of Sierra Negra Volcano were burned. From conversations with various inhabitants of Isabela it is known that the fire was started on 12 April by hunters who forgot to extinguish their cooking fires. Winds then spread the flames.

The tragic event alarmed biologists, ecologists and natural resource managers from national and international institutions alike. Through mass efforts by personnel of the Galápagos National Park Service (GNPS), the National Institute of Galápagos (INGALA), the Ecuadorian Forestry Institute of Natural Areas and Wildlife (INEFAN), the Municipality of Isabela, the Ecuadorian Army, the Charles Darwin Research Station (CDRS), and the Civil Defense, and in part, due to an increase in precipitation, the fire was finally put out on 7 June.

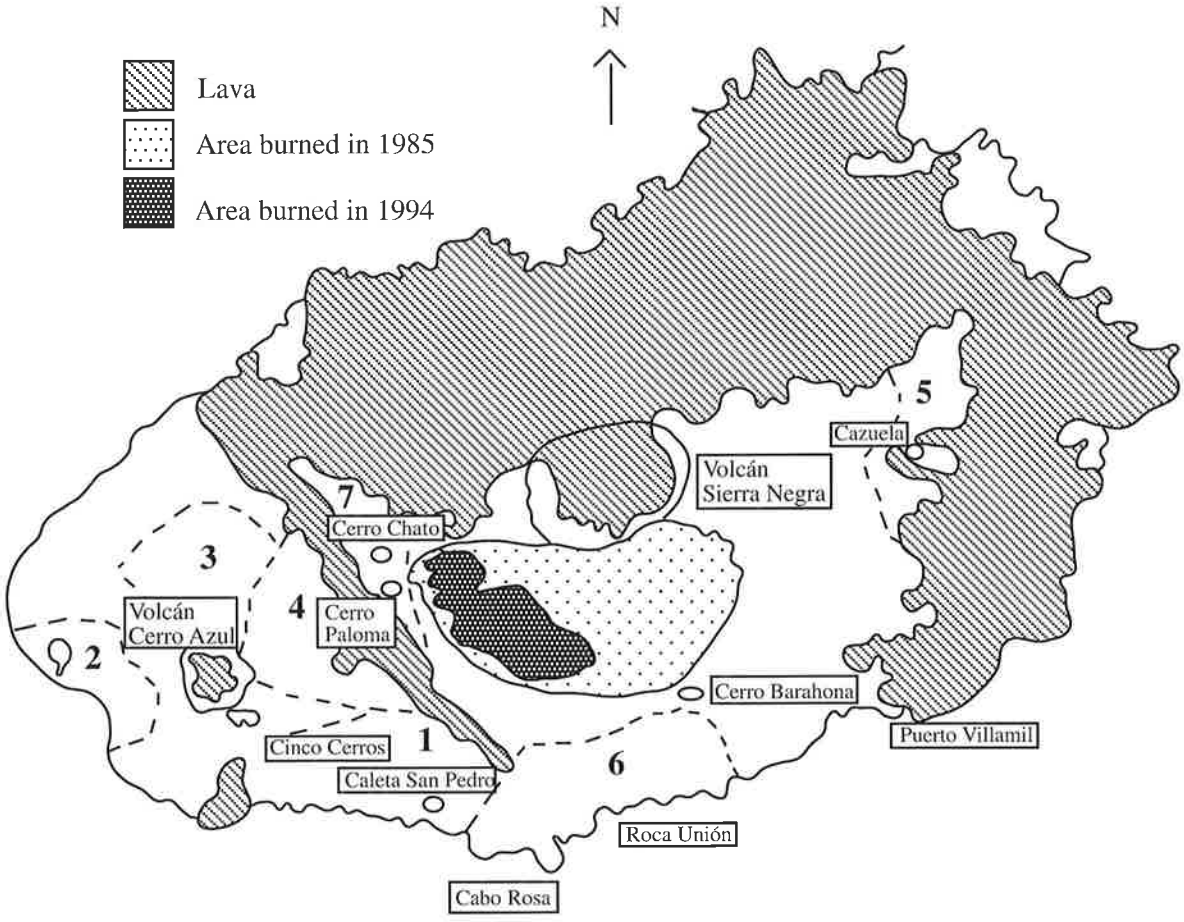
Fortunately the fire was only about one fifth the strength of Isabela's last wild fire which occurred in 1985. That fire burned 20,000 ha in the same area, in the same months, and under similar climatic conditions (Márquez, 1987). While in 1985 the fire never endangered the tortoises of Cerro Paloma and Roca Unión, due to the potential threat, preventative measures were taken and some individuals were evacuated to enclosures constructed at Roca Unión and Caleta San Pedro.

THE REPTILES

In the past, the herpetofauna of southern Isabela and particularly that of Sierra Negra has continuously been decimated by introduced feral mammals such as pigs, dogs and cats and even by humans themselves, but never by any of the known wild fires. During the 16th to 19th centuries Galápagos was a refuge for buccaneers and whalers (Slevin, 1931; Townsend, 1925). They decimated tortoise populations for food throughout the archipelago and in particular on southern Isabela. However, the intermediate-sized tortoise, *Geochelone guntheri,* remained abundant in the grasslands of Sierra Negra up until the first decades of this century (Slevin, 1959; Van Denburgh, 1914; Beck, 1903). Human population growth in Isabela, beginning about 1897, drastically diminished the tortoise population until the defenseless animals became virtually extinct. A few individuals survived in the lower, semi-arid zones of Sierra Negra and a small colony survived in sympatry with a population of its relative, *G. vicina,* in Cinco Cerros on Cerro Azul (Fig. 1). However, even today colonists continue to threaten the survival of the populations in Cerro Paloma, Cerro Cazuela, Cabo Rosa-Roca Unión and Cincos Cerros, by killing and eating the tortoises.

On 23 April, while the fire burned, we visited the tortoises of Roca Unión. We found that while the fire did not threaten the tortoises in this zone, humans continued to endanger them. We found eight tortoise carapaces, whose plastron had been separated from the carapace with a machete; the limbs were dismembered and missing. The animals had been sacrificed for their meat.

Between 28 April and 2 May we visited the tortoises of Cerro Paloma to look for and evacuate tortoises to the Breeding Center in Puerto Villamil. We did not find any evidence of recent poaching, only the carapaces of tortoises killed in 1988 (Snell, 1988). However we did see the same type of machete cuts on the cacti along the tortoise trails as those we had observed along the trails in Roca Unión. This suggests that the same group of men that were eating tortoise meat on Roca Unión may also have been searching for tortoises at Cerro Paloma.



Tortoise Zones

Cerro Azul
1. Cinco Cerros
2. Las Tablas
3. Los Gavilanes
4. Los Cráteres

Sierra Negra
5. Cerro Cazuela
6. Cabo Rosa and Roca Unión
7. Cerro Paloma

Figure 1. Map of southern Isabela Island showing locations of tortoise populations (Zones 1-7) and the areas burned in 1985 and 1994.

EVACUATION STRATEGIES

During the 1994 fire, the staff of GNPS, CDRS, the Civil Defense and the Ecuadorian Military surveyed the burned area on foot and by air. No charred remains of lava lizards (*Microlophus* =*Tropidurus albemarlensis*), geckos (*Phyllodactylus galapagoensis*), snakes (*Phylodryas* or *Alsophis* sp.), land iguanas (*Conolophus subcristatus*) or giant tortoises (*Geochelone guntheri* or *G. vicina*) were found. Nonetheless, the absence of copses and bones does not prove that reptiles were not killed in the fire. Furthermore, uncontrollable fires on Isabela had previously destroyed tortoise habitat at both Cerro Paloma and Roca Unión. Given the potential danger of the 1994 fire to tortoise populations, the following strategies for evac-

uating tortoises from the two critical areas were developed:

Tortoises at Roca Unión and San Pedro

1) The tortoises would be evacuated if the fire advanced to about 1 km either from Cerro Barahona or the southern most extremity of the lava flow.
2) The tortoises would be transferred to the two evacuation enclosures constructed in 1985, one at 0.5 km from the coast at Roca Unión and the other only 8 m from the coast at Caleta San Pedro.
3) The tortoises nearest to the enclosures would be chosen for transfer.
4) Park wardens would be stationed at the enclosures to feed and care for the tortoises.
5) Prior to transferring the tortoises, they would be marked with white paint on the fourth dorsal plate with the initials of the sector from which they were taken.

Tortoises at Cerro Paloma

1) Tortoises would be evacuated if the fire advanced towards Cerro Chato.
2) Tortoises would be moved directly to the Breeding Center in Puerto Villamil; the smaller individuals would be transported by burro and the larger by helicopter.

EVACUATION OF THE TORTOISES IN 1994

Considering the real threat of poaching and the potential threat of the forest fire on the tortoises, the transfer of individuals to the Breeding Center was considered the only way to recover the populations of tortoises at Cerro Paloma and Cerro Cazuela (a tortoise area far from the fire but with a high level of poaching). Due to the fire fighting activities, two helicopters of the Ecuadorian Army were available to evacuate the larger adult tortoises.

In the first week of May, after four days of searching for tortoises around Cerro Paloma, five individuals were captured. Of these, two (a juvenile and a male) were transported out by burro, and the other three (two males and a juvenile) were evacuated by helicopter. In the weeks that followed, five more tortoises were evacuated (a male, a female and three juveniles). These tortoises will be kept in the Breeding Center in hopes of establishing a reproductive group and producing young tortoises to repopulate the slopes of Sierra Negra. These initial efforts must be continued so that the survival of the tortoise populations of southern Isabela will be assured.

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