Historical Research Center, Reference Division, Maxwell Air Force Base, Microfilm reel 32958.
Panama Canal Department. 1947. Galapagos. USAF Historical Research Center, Reference Division, Maxwell Air Force Base, Microfilm reel 32958.
Roosevelt, F.D. 1942. Letter of 4 March from Dr. Waldo LaSalle Schmitt. Franklin D. Roosevelt Library, Box OF 4017: Galápagos Islands.
Roosevelt, F.D. 1944. Memorandum of 1 April to the Secretary of State. Franklin D. Roosevelt Library, Box OF 4017: Galápagos Islands.
Schmitt, W.L. 1942. Diary. Smithsonian Institution Archives, Record Unit 7231: Waldo LaSalle Schmitt Papers, Box 100, Folder 8.
Wetmore, A. 1942a. Letter of 5 June to Dr. Waldo LaSalle Schmitt. Smithsonian Institution Archives, Record Unit 7006: Alexander Wetmore Papers (unprocessed) Box 90.
Wetmore, A. 1942b. Letter of 7 July from Dr. W.L. Schmitt. Smithsonian Institution Archives, Record Unit 7006: Alexander Wetmore Papers (unprocessed) Box 90.
Wetmore, A. 1942c. Memorandum of 20 November to Mr. M.L. Leap, Department of State. Smithsonian Institution Archives, Record Unit 7006: Alexander Wetmore Papers (unprocessed) Box 90.
Wetmore, A. 1942d. Letter of 25 August from Dr. W.L. Schmitt. Smithsonian Institution Archives, Record Unit 7006: Alexander Wetmore Papers (unprocessed) Box 90.
Wetmore, A. 1942e. Letter of 10 December to Mr. M.L. Leap. Smithsonian Institution Archives, Record Unit 7006: Alexander Wetmore Papers (unprocessed) Box 90.
Wetmore, A. 1942f. Letter of 17 December from Mr. M.L. Leap. Smithsonian Institution Archives, Record Unit 7006: Alexander Wetmore Papers (unprocessed) Box 90.

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A 25-YEAR MANAGEMENT PROGRAM PAYS OFF: REPATRIATED TORTOISES ON ESPAÑOLA REPRODUCE

By: Cruz Márquez, German Morillo, and Linda J. Cayot

The first indisputable evidence of successful reproduction by repatriated Galápagos tortoises (*Geochelone spp.*) was recorded on Isla Española on 30 November 1990. Two hatchlings were found approximately 90 m north of El Caco (one of the two release sites). Both were approximately 1 month old and had been eaten by hawks. Female No. 57 was observed completing a nest (0930), and female No. 61 showed evidence of recent nesting activity (dried mud covering her posterior region). The females were also located within 80-100 m of El Caco.

A total of four nests were found and were estimated at 1, 2, 5, and 8-10 days old. All were located within 100 m to the northwest of El Caco. Attempts at nesting (scrapes or holes in the soil) were found in the area surrounding El Caco, encompassing approximately 800 m to the north, 500 m to both the east and west, and 200 m to the south. Nest attempts were also seen in the region above Las Tunas (alternate release site). C. Márquez and T. Fritts had noted similar scrapes resembling nesting attempts on Española in December 1985 but now the evidence that the repatriated tortoises were reproducing is irrefutable.

Española tortoises (*G. hoodensis*) are the only race bred in captivity at the Charles Darwin Research Station (CDRS) as part of the breeding and rearing program run jointly by the CDRS and the Galápagos National Park Service (GNPS; MacFarland et al. 1974a, Márquez et al. 1990). Tortoises from other Islands are reared in the program, but using young extracted from natural nests. By the mid-1960s, the native population was too low for successful reproduction (MacFarland et al. 1974b). Beginning in August 1963, all tortoises found on Española were transferred to the breeding center at the CDRS. A third male, returned to the CDRS from the San Diego Zoo in July 1977, augmented the breeding population of 12 females and 2 males (Bacon 1978, Fritts 1978).

The first successful reproduction by Española tor-

toises in captivity was in 1970-71. The first hatchlings reared in the center were repatriated to Española (at El Caco) in 1975 (Fig. 1). Thus the oldest repatriates were nearly 20 years old in November 1990. The two females that showed evidence of having nested (Nos. 57 and 61) are both from the 1973-74 cohort, and were repatriated to El Caco in March 1978. They were nearly 17 years old when they nested. Whether or not their nests are successful will be determined at the end of the incubation season. Based on the November 1990 observations, Española tortoises first reproduce between the ages of 16 and 19 years.

Figure 1. Tortoise no. 27, one of the tortoises hatched in captivity in 1971 and returned to Española at the age of four, moves across the rock terrain in 1985 as a young adult male tortoise. *Tortuga no. 27, una de las tortugas criadas en cautiverio en 1971 y devuelta a Española a los cuatro años de edad, aparece aquí en 1985 en terreno rocoso como un macho subadulto.*

The breeding, rearing, and repatriation program of the GNPS and the CDRS has been very successful in increasing the threatened tortoise populations to a level of security. However, until the repatriated tortoises begin to successfully reproduce on their islands of origin, the ultimate success of the program is not assured. Although the only hatchlings found had been eaten by hawks, their appearance on Española is a major indicator of the ultimate success of this long-term program and the possibility exists that other young have escaped the notice of hawks and scientists alike.

LITERATURE CITED

Bacon, J.P. 1978. A tortoise goes home. ZooNooz 51(2):4-7.

Fritts, T.H. 1978. Española tortoise returns to Galápagos. Noticias de Galápagos 28:17-18.

MacFarland, C.G., J. Villa, and B. Toro. 1974a. The Galápagos giant tortoises (*Geochelone elephantopus*) part II: conservation methods. Biological Conservation 6:198-212.

MacFarland, C.G., J. Villa, and B. Toro. 1974b. The Galápagos giant tortoises (*Geochelone elephantopus*) part I: status of the surviving populations. Biological Conservation 6:118-133.

Márquez, C., S. Rea, and F. Llerena. 1990. Reproduction and rearing of giant tortoises and land iguanas in captivity. Pp.71-75 *in* CDRS Annual Report 1986-87.

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REVIEW: PORTRAITS OF GALAPAGOS

Authored By: Tui De Roy and Mark Jones
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Reviewed By: Gay Ver Steeg

This new "coffee-table" volume of photographs of the animals of Galápagos is a sensitive effort by Tui De Roy and Mark Jones, both permanent residents of Galápagos. It is primarily a photographic collection of close-ups by species of the most common land animals (various birds, giant tortoises, land iguanas, and lizards) and sea animals (marine iguanas, sea lions, fur seals, sperm whales, hammerhead