

MOVEMENTS OF A PELAGIC-PHASE WRECKFISH, *POLYPRION AMERICANUS* (SCHNEIDER, 1801), AS INDICATED BY TAG AND RECAPTURE

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Pelagic juvenile wreckfish, *Polyprion americanus* (Schneider, 1801) were tagged in the surface waters around the Central Group of the Azores. One wreckfish was recaptured three months after tagging, and 217 km from its release point. It had settled to the bottom in 254 m of water. The recapture of this specimen suggests that wreckfish take up a demersal life at a total length of about 50 cm.

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Vários chernes juvenis, *Polyprion americanus* (Schneider, 1801) foram capturados à superfície da água e marcados em vários locais próximos das ilhas do Grupo Central dos Açores. Um dos exemplares foi recapturado 3 meses depois ter sido marcado, a 217 km do local onde tinha sido libertado e a uma profundidade de 254 m. A recaptura deste espécime indica que o cherne passa para uma vida demersal quando atinge um comprimento total de cerca de 50 cm.

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INTRODUCTION

The wreckfish, *Polyprion americanus* (Schneider, 1801), is globally distributed in temperate rocky-bottom habitats on insular and continental slopes. In the western Atlantic Ocean, wreckfish are found from about 45°N to 45°S. The wreckfish is a large demersal species, and adults in the western North Atlantic are known only from rocky bottom and coral pinnacles on the Blake Plateau and Great and Little Bahama Banks, in depths from 450 to 600

m (SEDBERRY et al. 1994; SEDBERRY et al. 1996). Spawning occurs on the Blake Plateau, primarily in February and March (D. Wyanski pers. comm.). While large demersal wreckfish have a limited distribution in the western Atlantic, pelagic juveniles are found north of Cape Hatteras, and into Canadian waters, and are abundant in the eastern North Atlantic. Juvenile wreckfish live at the surface to a length of at least 30 cm, where they associate with floating objects (ROBERTS 1989). Wreckfish are recruited to the Blake Plateau at age four, which corresponds to a mean

total length of 68 cm (G. SEDBERRY et al. unpubl.). Wreckfish smaller than 65 cm total length have not been observed in fishery landings, by research vessel, or from submersible on the Blake Plateau, and fish less than 85 cm are very rare there (SEDBERRY et al. 1996).

The fishery for wreckfish in the southeastern United States developed in the mid-1980s, and the species formerly had been considered rare in the western North Atlantic (ROBINS & RAY 1986). Because of its perceived rarity and very specific habitat requirements, the wreckfish has been managed conservatively. SEDBERRY et al. (1994) reviewed development of the fishery from its establishment through the first management plans. Management measures in the U.S. now include a total allowable catch, individual transferable quotas, gear restrictions (no longlines) and a spawning season closure of the fishery. The management plan assumed a single stock of wreckfish in the North Atlantic, which has since been confirmed with mtDNA analyses (SEDBERRY et al. 1996). However, little is known about recruitment of wreckfish to the Blake Plateau fishing grounds, or when or where pelagic juveniles from Blake Plateau spawning descend to their adult benthic habitat. A single genetic stock of wreckfish extends from the only documented North Atlantic spawning grounds off South Carolina to the Madeira archipelago and Mediterranean Sea (SEDBERRY et al. 1996). Mechanisms for maintaining gene flow, and the patterns of recruitment of juveniles and adults are poorly understood, but some active adult migration or drifting of pelagic juvenile phases must be involved (SEDBERRY et al. 1996).

American wreckfish are often caught on the Blake Plateau fishing grounds with fish hooks, already in their mouths and guts, which are of a type not used by American fishermen. SEDBERRY et al. (1996) speculated that these hooks, which are used by European fishermen, are acquired by demersal wreckfish in the eastern Atlantic from bottom longlines, before migrating to the Blake Plateau.

To explain distribution of mtDNA haplotypes in the North Atlantic and to corroborate the circumstantial evidence about recruitment patterns derived from fish hooks (SEDBERRY et

al. 1996), we began tagging pelagic juvenile wreckfish in the eastern Atlantic, around the Azores and Madeira archipelagos. Here we report the recapture of a tagged juvenile wreckfish.

MATERIAL AND METHODS

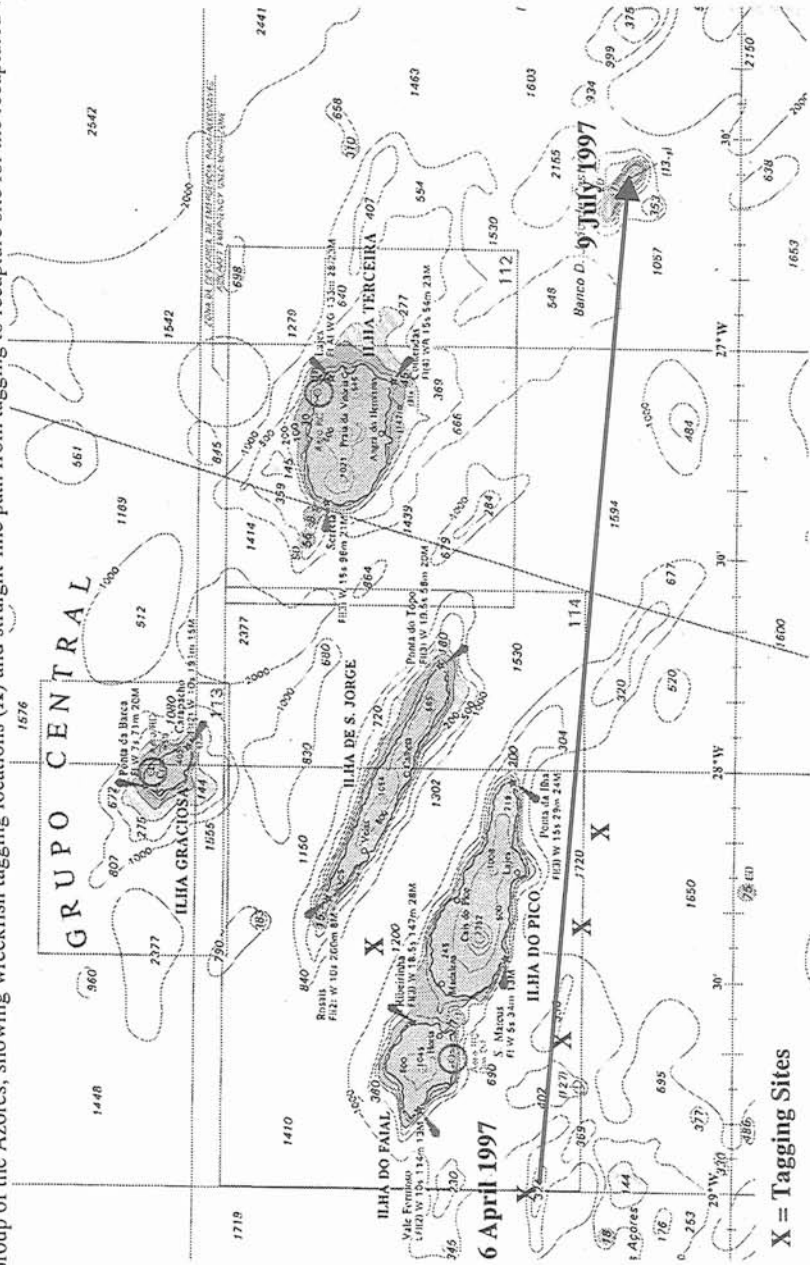
Wreckfish (n=20) were tagged with nylon dart tags (Hallprint 146 mm) inserted with a canula between the pterygiophores of the first dorsal fin. Five fish were double-tagged with an internal anchor tag (Floy 0.5 x 1.9 cm oval anchor; 7.6 cm streamer) in addition to the dart. Tagging took place in waters adjacent to the Central Group of islands of the Azores archipelago (Fig. 1). Tags were printed with identification numbers and the word "reward" and "mail to" in English, French, Portuguese and Spanish. The return address of the senior author's laboratory was printed on the tag. Posters describing the tagging program and advertising a reward (in the four languages) were distributed among the major fishing ports in the Azores, Madeira, Canary islands and Majorca, with instructions to contact either of the authors' laboratories. The tagging program was publicised in the southeastern U.S. with posters and press releases.

Epipelagic juvenile wreckfish for tagging were located by spotting floating debris and dipnetting or angling fishes associated with the debris. Tagging took place in June 1996 (n=1), and in April (n=14) and July (n=5) 1997.

RESULTS AND DISCUSSION

Floating objects with which wreckfish were found consisted primarily of plastic debris, including sheeting, packaging, shopping bags, buckets, jugs, buoys and polypropylene line; styrofoam floats; sealed metal cans; glass bottles; and vegetable matter such as woody plants and branches, lumber, and (rarely) coconuts. Juvenile wreckfish were most commonly associated with floating plastic buckets and boxes with some barnacle encrustation, and would only venture out to take bait when other small fish species were present. These species were most commonly grey triggerfish, *Balistes capricus*; and oceanic horse mackerel, *Trachurus picturatus*. Other species encountered with floating objects included

Fig. 1
 Central Group of the Azores, showing wreckfish tagging locations (X) and straight-line path from tagging to recapture site for the recaptured wreckfish



pompano, *Trachinotus ovatus*; the centrolophid *Schedophilus ovalis*; and pilotfish, *Naucrates ductor*. Juvenile loggerhead turtles, *Caretta caretta*, were often observed when looking for debris. Occasionally, presumed predators of juvenile wreckfish (dolphin fish, *Coryphaena hippurus*; sharks, *Isurus* sp. and *Sphyrna* sp.) were encountered beneath windrows and near debris, and no wreckfish or other small fishes were encountered when large predators were present.

One wreckfish we tagged at the surface, near a floating tree, in approximately 1000 m of water near Condor de Fora Seamount, 38 km southwest of Horta on Faial Island (tagging location: 38°22'N, 29°00'W), was later recaptured. This fish was 49.0 cm total length when tagged on 6 April 1997, and it was recaptured on 9 July 1997 by a commercial fisherman using bottom longline in 254 m depth. The specimen was caught 217 km east-southeast of its release point, at a location 0.9 km east of Banco D. João de Castro (at 38°13.6'N, 26°33.9'W). The wreckfish weighed 2.85 kg when recaptured, which indicates a total length of 50.1 cm, according to the length-weight regression provided by SEDBERRY et al. (1994).

The wreckfish congener *Polyprion oxygeneios* also lives at the surface as a juvenile, and switches from pelagic to the demersal habitat at around 50 cm TL and 3-4 years old (M. Francis pers. comm.). Wreckfish also apparently take up the demersal habitat at about 50 cm. We have not aged wreckfish this small, but data from *P. oxygeneios* suggest that these fish may be over one year old, and theoretical and back-calculated wreckfish lengths at age indicate that these fish may be two years old or older (G. SEDBERRY et al. unpubl.).

This change in size and depth from tagging to recapture is consistent with known and surmised life history, and this is the first documentation of wreckfish completing a transition from the

epipelagic to benthic habitat. Additional tag recoveries should further elucidate the timing and nature of the transition for the North Atlantic population.

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REFERENCES

- ROBERTS, C.D. 1989. Reproductive mode in the percomorph fish genus *Polyprion* Oken. *Journal of Fish Biology* 34: 1-9.
- ROBINS, C. R. & G. C. RAY. 1986. *A field guide to Atlantic coast fishes of North America*. Houghton Mifflin Co, Boston, Massachusetts. 354 pp.
- SEDBERRY, G.R., G.F. ULRICH & A.J. APPLIGATE. 1994. Development and status of the fishery for wreckfish (*Polyprion americanus*) in the southeastern United States. *Proceedings of the Gulf and Caribbean Fisheries Institute* 43: 168-192.
- SEDBERRY, G.R., J.L. CARLIN, R.W. CHAPMAN & B. ELEBY. 1996. Population structure in the pan-oceanic wreckfish, *Polyprion americanus* (Teleostei: Polyprionidae), as indicated by mtDNA variation. *Journal of Fish Biology* 49 (Supplement A): 318-329.

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