Introduction to the Turks and Caicos Islands Bonefish Research Project Tagging Program

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ABSTRACT

Bonefish, *Albula vulpes*, are the focus of both a small-scale commercial and a recreational sport fishery in the Turks and Caicos Islands, yet there is currently no management plan in place to help conserve bonefish stocks. In 1992, Bell Sound Nature Reserve was created with bonefish noted as a species of interest, however it remains unclear as to whether this reserve is an effective management tool. The Turks and Caicos Islands Bonefish Research Project was established to provide a better understanding of bonefish on the Caicos Bank and form the basis of a management plan. The first part of the project is a tag and recapture program designed to assess the movements of bonefish. To date, 120 bonefish have been tagged. One fish tagged in Bell Sound Nature Reserve was recaptured north of the reserve. Although additional tagging and recaptures are necessary, these results suggest that other management tools may be required to conserve local bonefish stocks.

KEY WORDS: Bonefish, *Albula vulpes*, movement, Turks and Caicos Islands,

INTRODUCTION

Bonefish, *Albula vulpes*, are an important resource in the Turks and Caicos Islands (TCI). For generations, bonefish have been the focus of a subsistence/small-scale commercial fishery with catches being sold to individuals or small restaurants in local communities. Currently, a sport fishery for bonefish is also developing in the TCI, and is strongly supported by the government that depends on tourism for the majority of its revenue. Recreational anglers commonly practice catch and release (Kaufmann 2000), increasing the potential value of each fish returned to the water as opposed to being consumed.

Despite the importance of bonefish to the economy in the TCI, there is currently no management plan in place for either the subsistence or sport fishery. This, to a large part, is due to the lack of scientific information regarding bonefish populations both globally and in the TCI (Mojica et al. 1995, Crabtree et al. 1997). For example, aside from daily tidal migration patterns, little is known about the habitat preferences or long-term movements of bonefish (Colton and Alevizon 1983). In addition, although Crabtree et al. (1996, 1997, 1998) have provided a good understanding of the life history and feeding habits of bonefish in the Florida Keys,

it is uncertain as to whether the information obtained from these studies is transferable to other populations in the region.

Bell Sound Nature Reserve (BSNR) was established near South Caicos in 1992 with bonefish noted as a species of special interest, even though little information exists for bonefish inhabiting this area. As such, it remains unclear whether BSNR is effective in conserving local stocks. Moreover, other management tools may be necessary to protect local stocks in light of the growing use of monofilament nets for the harvest of bonefish. Anecdotal information from sport fishing guides indicates that monofilament nets are being deployed across tidal creeks resulting in the mortality of large numbers of smaller, juvenile bonefish, as well as the by-catch of other important species such as marine turtles. In response, the Turks and Caicos Islands Bonefish Research Project (TCI-BRP) was initiated to gather information necessary to form a management plan for bonefish in the TCI, leading to the conservation of local stocks. The first part of the TCI-BRP is a conventional tag and recapture study used to assess movement of bonefish on the Caicos Bank including the waters in and around BSNR.

MATERIALS AND METHODS

The TCI are located at the southern end of the Bahamian archipelago, about 180 km north of Hispaniola. South Caicos is situated on the eastern side of the Caicos Bank with BSNR (approximately 12 km^2 in size) abutting the northern side of the island (Figure 1).

Two methods are being used to collect bonefish for the purpose of tagging and recapture. Students from The School for Field Studies – Center for Marine Resource Studies are tagging and recapturing bonefish near South Caicos and in BSNR, using a traditional method of capture known as 'hauling'. A large, nylon seine (1.8 m x 60 m, 38 mm mesh) is stretched out in relatively shallow water when a school of bonefish is spotted, and the ends of the net are brought together to encircle the fish. The second method of capture is by sport fishers using hook and line. Several sport fishing charters on various islands are participating in the project by tagging bonefish caught by their clients, and by recording the recapture or sighting of any previously tagged fish.

When landed, each bonefish is measured (total length (TL) and fork length (FL) to the nearest cm), weighed if a scale is available, and the habitat type where caught is recorded. The fish are tagged on the left side just under the dorsal fin using a T-bar anchor tag (Floy Tag model FT-68B with ¾" monofilament base between the vinyl tubing and the anchor end). Each tag is individually numbered and includes details regarding the project (project name and phone number). Tags are also color-coded according to one of five designated areas on the Caicos Bank. Brightly colored tags are used so tagged fish can be visually identified in shallow water, which can provide information on movement even if a fish is not recaptured. In addition, each of the five designated fishing areas is subdivided into smaller fishing zones to allow anglers and guides to indicate a general location as to where a fish

was tagged or recaptured without giving away details of their fishing locations. When a fish is recaptured, tag number and color, fish length and weight, habitat type and fishing zone are recorded.

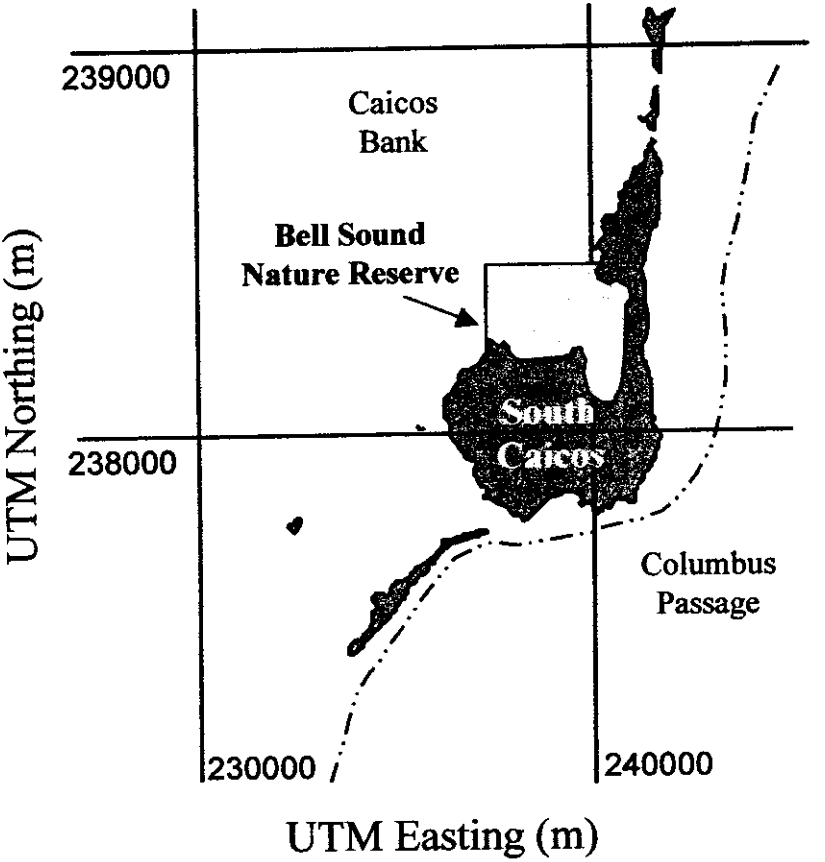

Figure 1. Bell Sound Nature Reserve, South Caicos, BWI. Coordinates are for the Universal Transverse Mercator (UTM) metric grid system in Zone 19N.

RESULTS AND DISCUSSION

To date, 120 bonefish have been tagged on the Caicos Bank, ranging in size from 28 to 72 cm TL (Figure 2). Preliminary assessment of the data suggests that the average size of bonefish increases from west to east across the Caicos Bank. Information obtained from anglers indicates that larger individuals caught were solitary or a part of small schools (< 5 fish), whereas smaller fish were from larger schools.

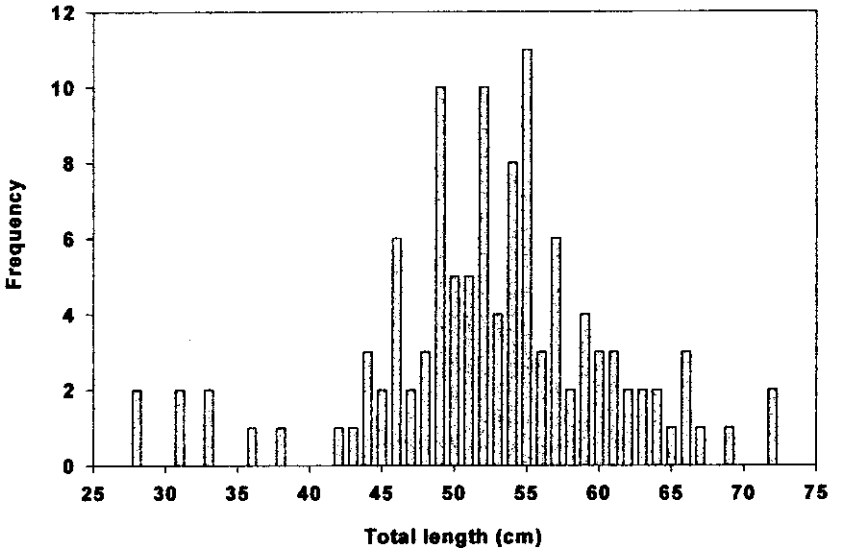

Figure 2. Length-frequency distribution of tagged bonefish on the Caicos Bank.

One tagged bonefish has been recaptured. It was originally tagged in BSNR on 30 November 2000, and was recaptured on 20 March 2001 by a local commercial fisher approximately 2 km north of the reserve. The fish had grown approximately 1 cm between the time of tagging and recapture. A second tagged fish was sighted by a local sport fishing guide, and the tag color indicated that the fish had been tagged in the same area of the Caicos Bank.

Results thus far indicate it is likely that bonefish travel in and out of BSNR making them susceptible to harvest by local fishers. As such, the use of this no-take reserve may not be entirely effective as a management tool for local bonefish stocks. The continuation of the tag and recapture program, and the addition of life history studies should provide the information about bonefish on the Caicos Bank needed to develop a management plan, which will aid in the conservation of local bonefish stocks.

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