

**Spiny Lobster Management Program
in St. Kitts/Nevis**

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St. Kitts/Nevis has about five hundred full and part-time fishermen, using an estimated 283 fishing boats, and lobster fishing is generally conducted by approximately one-third of these fishermen. Lobsters have traditionally been caught by trap fishermen, and have recently been heavily fished by SCUBA divers. Exportation of lobsters has recently declined to almost zero, possibly because of the difficulty in obtaining the necessary catch. Hence, local fishermen have tended to ignore fisheries regulations and are capturing and selling undersized lobsters as well as lobsters bearing eggs. Data on total landings are not readily available, but the annual catch is estimated at about 65,000 pounds. The maximum sustainable yield of spiny lobster population in St. Kitts/Nevis waters can be estimated from the total shelf area around the two islands. The estimate of MSY obtained in this way is very close to the current annual landings. We do not consider this estimate entirely satisfactory because we have not yet been able to determine the percentage of the coastal shelf which provides suitable lobster habitat. This estimate does, however, provide another indication of the urgent need for reliable information with which we can develop a suitable management strategy for these lobster resources.

There has recently been considerable concern over the possibility of overfishing in the spiny lobster fishery. Fishermen have complained that lobsters are becoming more scarce, resulting in greater use of SCUBA diving equipment for fishing in deeper waters. Most fishermen have no training in the use of this equipment and because of this the risk of injury or death to lobster divers is increasing. Local conservation groups have also expressed concern, particularly with the capture and sale of juvenile and egg-bearing lobsters.

In response to these concerns, the government of St. Kitts/Nevis has undertaken development of a comprehensive management program for local spiny lobster stocks. The parti-

icipation of local fishermen is vital to the fishery development plans, hence, emphasis is being placed on a voluntary and cooperative approach to management instead of relying exclusively on legal restrictions. At present, the Fisheries Department is gathering critical information needed to manage local lobster stocks, as well as providing public information concerning the need for improved management and ways in which the public can assist.

The overall objective of the spiny lobster management program is to ensure continued benefits to the people of St. Kitts/Nevis through optimum use of local spiny lobster resources. In order to achieve this objective, we intend to produce a management plan which will provide for optimum lobster harvest as well as protection of reproductive stocks, juvenile lobsters, and critical nursery areas. The information needed for this plan includes optimum minimum size to be captured, optimum fishing effort, minimum reproductive size, season of peak reproductive activity, and location of major nursery areas.

Three activities are underway to provide this information. First, wild populations of lobsters are being surveyed to determine length frequencies at various times of the year. This information will be used to estimate growth rate, total mortality, and minimum reproductive size. In most cases, lobsters are also being tagged to provide additional estimates of growth and mortality rates. Tagged lobsters receive a tail notch as well as a plastic tag, which allows us to detect tag loss. We are sampling populations in artificial habitats made from oil drums and old vehicles as well as natural habitats around coral reefs. The second activity is sampling of lobster landings to estimate total catch and fishing effort. This activity is being conducted in cooperation with the Caribbean Regional Spiny Lobster Management Program initiated through GCFI last year. The third activity is the identification of important nursery sites with the aid of collectors for lobster postlarvae, which are being installed in bays on the coasts of St. Kitts and Nevis to compare the numbers of small lobsters recruited to these sites.

We should point out that funding for these activities has been limited, and therefore, we have had to economize whenever possible. In the case of the postlarvae collectors, for example, we wanted to use the devices described by Witham et al. (1968) which have been successfully used for similar purposes in Florida. Basically, these devices consist of sheets of loosely woven plastic mat which are suspended from floats anchored in potential lobster nursery areas. The mats become overgrown with algae, and thus provide an attractive habitat for the postlarvae. The plastic material specified for these collectors, however, is quite expensive, and is impossible to obtain locally. For this reason we have experimented with plastic bags used to contain various agricultural products. Tightly woven rice bags have not proven to be particularly attractive to algae, and tend to float at the surface of the water. Onion bags, however, do not have these problems, and

have been quite effective as substitutes for the materials used in other studies. We expect these collectors to allow us to compare various coastal areas from the standpoint of recruitment of juvenile lobsters, as well as providing additional information on the times of the year in which maximum recruitment occurs.

We have encountered several problems with our tagging studies. First, the disturbance caused by the tagging process often causes juvenile lobsters to abandon the habitat in which they were tagged, making recapture difficult. We plan to deal with this problem by placing artificial habitats such as tires or oil drums in the vicinity of future tagging sites to provide alternative shelters which can be sampled for recaptures. A second difficulty has been that the tags of recaptured lobsters have been heavily chewed, presumably by other lobsters sharing the same habitat. We plan to try changing the color of the tags to deal with this problem. Finally, we are not at all convinced that all of the tagged lobsters caught by fishermen are being reported. We are emphasizing the need for cooperation through our public information program, but suspect that there will always be some recaptures which are not reported. This means that tag-recapture data may not provide an accurate estimate of overall population size, but we do expect to obtain direct information on growth rates. In addition, measurements taken at the time of tagging are being used to prepare length frequency distributions needed to determine the best management strategy. The recent addition of an Apple IIc microcomputer to our program is expected to greatly improve our data storage and analysis capabilities.

The government of St. Kitts/Nevis is in the process of enacting legislation and regulations recommended by recent workshops conducted by FAO and the Organization of Eastern Caribbean States. These regulations specify a minimum legal carapace length of 95 mm for landed spiny lobsters. Preliminary results from our length frequency studies indicate that the growth rate of spiny lobsters in St. Kitts/Nevis waters is at least 20 mm per year, and possibly considerably higher. The smallest egg-bearing female encountered to date had a carapace length of 82 mm, while the smallest female lobster with a tar spot measured 78 mm. These results suggest that the proposed regulations are conservative enough to permit at least one season of reproductive activity before lobsters may be legally captured. Our data are not yet complete enough to allow us to determine optimum minimum size, but we expect to be able to make this prediction within the next year.

Samples of landed lobsters and lobsters in local hotels show that at least one quarter of current landings are below the proposed minimum legal size. Moreover, there have been several reports of individuals who habitually take undersized and egg bearing lobsters. These circumstances have led us to emphasize public information as a key part of the St. Kitts/Nevis lobster management program.

The involvement of fishermen and the participation of the general public would not only assist us in obtaining necessary

information, but would help in disseminating information about the resource necessary to effect conservation and management efforts. Radio and television programs are being prepared in cooperation with the government broadcasting unit to improve local knowledge and appreciation of marine resources. Fact sheets have been prepared on a variety of topics in the fisheries program and are distributed throughout the island. Demonstrations and discussions at schools and fishermen's groups are used to stimulate greater public involvement in fishery management programs. Newspaper articles and brochures will be included in this program in the near future.

The spiny lobster management program is one example of the integrated approach being applied to fisheries development in St. Kitts/Nevis. Research to gather information needed for fisheries management takes place alongside extension assistance to fishermen to improve landings and local benefits from local ocean resources. Public involvement in resource management is one of the most important features of this approach. We are pleased that this catch sampling program is integrated with a wider regional effort through GCFI, and hope that other parts of the program can be similarly linked with increased regional activity for improved use of Caribbean spiny lobster resources.

LITERATURE CITED

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