

The Status of Turneffe Atoll's Commercial Fishery



Obtaining the best available information about the status of Turneffe's commercial fishery is essential for making informed management decisions. Although detailed information has been somewhat difficult to obtain and concerns have been voiced that Turneffe's fishery cannot be adequately assessed, a clearer picture of a declining fishery is emerging.

The best source of information about Turneffe's fishery is the Fisheries Department which has quantified fishing cooperative sales originating from Turneffe for several years (Fisheries Data 2004 - 2009). This data demonstrates a 70% decline in Turneffe lobster sales to cooperatives between 2004 and 2009 - from 102,792 pounds in 2004 to 30,402 pounds in 2009. Perhaps as dramatic, Turneffe lobster sales, as a percentage of National sales, decreased from 20.4% to 6.2% over this period implying that the Turneffe fishery may be declining faster than others. During this period, conch sales to cooperatives originating from Turneffe declined by 57% and similarly, the percentage of Belizean conch production from Turneffe decreased from 6.2% to 2.0%.

This validity of the Fisheries data has been questioned due to 1) concern that a significant portion of Turneffe's lobster and conch product is being sold outside of the cooperatives at fish markets or to local restaurants, and 2) concern that cooperatives have not accurately reported the origin of lobster and conch products coming from Turneffe and Lighthouse due to sailboat fishers fishing both areas during the same trip.

To confirm or refute the validity of the Fisheries data, further analysis was undertaken. To this end, a randomized survey of Turneffe's fishermen was funded by Turneffe Atoll Trust and carried out by Mr. Dwight Neal.

It is well-known that Turneffe Atoll is fished by two distinct sectors of the fishing industry, i.e. fish camp operators and sailboat operators. There are approximately 25 fish camps at Turneffe and we determined that 20 sailboats regularly fish the atoll. A randomized survey with standardized questionnaires was obtained from 44% of fish camp operators and 40% of sailboat captains.

All fish camp operators and all sailboat captains reported that 100% of their lobster and conch landed at Turneffe is sold through cooperatives. With the statistical significance of this finding being +/- 9 %,

at least 91% of Turneffe’s lobster and conch production is process through cooperatives. This appears to address concerns about the validity of the Fisheries data related to this issue.

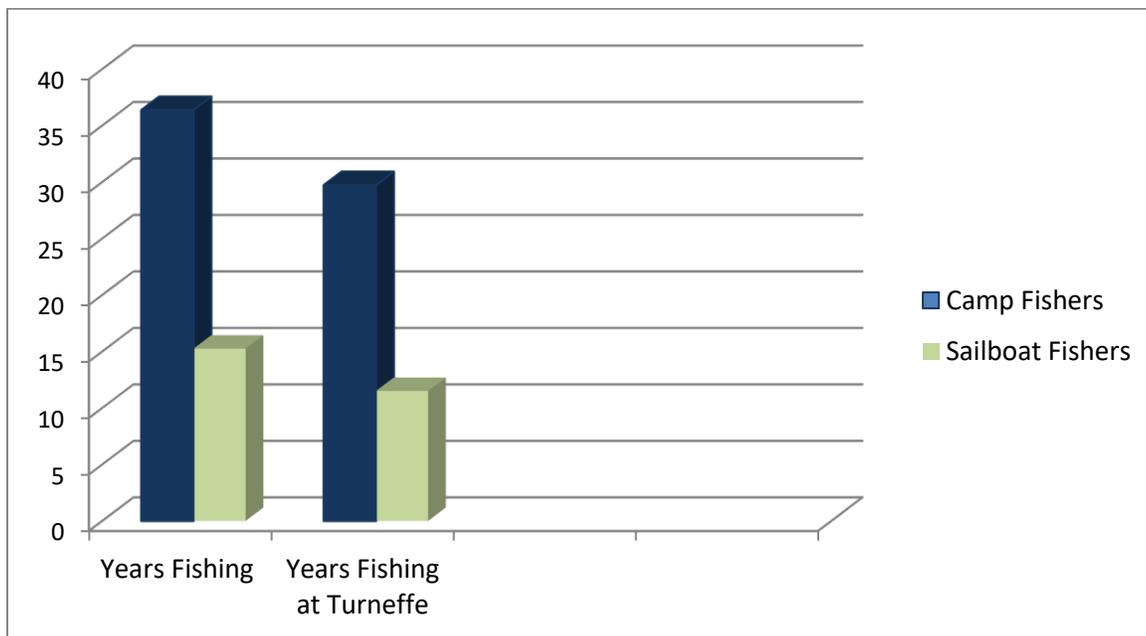
As expected, fish camp operators indicate that they spend 100% of their lobster and conch fishing time at Turneffe. Sailboat operators indicate that they spend an average of 96% of their lobster and conch fishing time at Turneffe and only 4% elsewhere. Therefore, an overwhelming percentage of lobster and conch production at Turneffe apparently comes specifically from Turneffe with little chance for overlap between Turneffe Atoll and Lighthouse Atoll. This finding is statistically significant at +/- 10%.

It appears, therefore, that the two principle concerns about the validity of the Fisheries data related to Turneffe have been addressed with greater than 90% certainty as essentially all lobster and conch landed at Turneffe is processed through cooperatives and there is very little opportunity for overlap of product landings between Turneffe and Lighthouse.

Next, we considered a marked decrease in fishing effort as a potential explanation for the decline in Turneffe’s fishery. Our survey sheds some light on this with 63% of sailboat operators having fished at Turneffe for 10 years or less. Furthermore, extrapolated numbers from our survey reveal that 4659 shades, 4909 traps and 454 drums are utilized by camp fishermen at Turneffe. This translates to more than 400 devices per acre if the entire atoll is considered. The concentration is obviously greater if you consider only the areas fished with these methods.

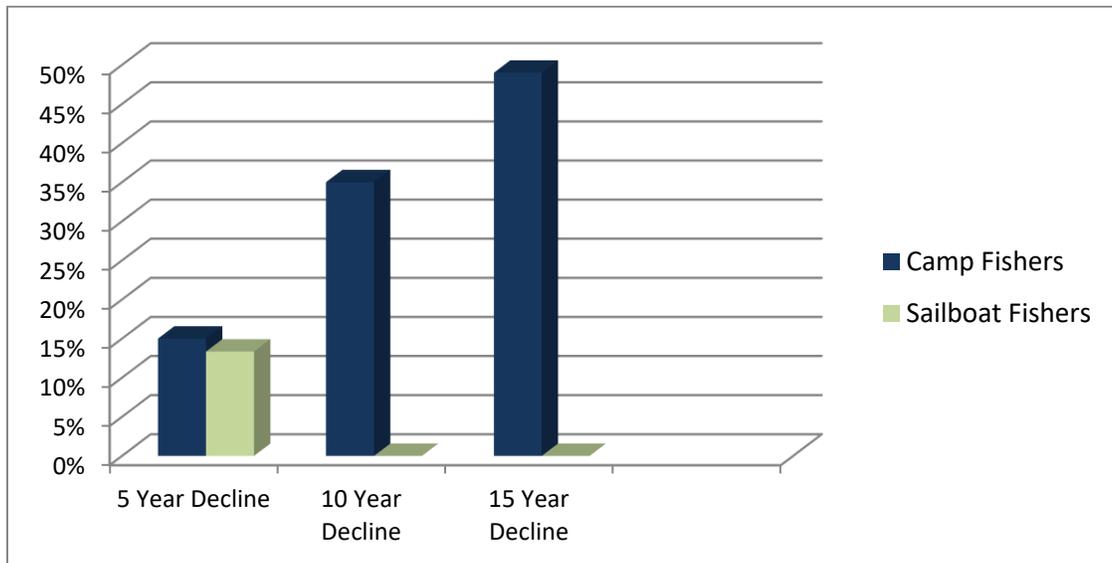
Lastly, we looked at observations from fishers to see how they match up with the Fisheries Department data. This required a look at the longevity fishing at Turneffe which differs considerably between camp fishers and sailboat fishers as shown in this chart.

Years Fishing at Turneffe Atoll



Both fish camp operators and sailboat operators were asked about changes seen in the fishery over 5 years, 10 years and 15 years. While sailboat fishers and camp fishers closely agree on the decline of the fishery over the past 5 years, only camp fishers have the pertinent longevity fishing at Turneffe to comment on 10 years and 15 years. The five fishers with the longest tenure at Turneffe estimate that Turneffe's fishery has declined an average of 58% over the past 15 years with their estimates ranging from 50% to 70%.

Estimated Level of Decline in Turneffe's Fishery



Conclusions: Turneffe Atoll landings data from the Fisheries Department was evaluated through a statistically significant randomized sample of Turneffe fishermen. This allowed us to clarify the two most commonly voiced concerns about the validity of Fisheries data.

- 1) Essentially all lobster and conch landed at Turneffe is processed through the fishing cooperatives which is confirmed through the survey with a probability greater than 90%.
- 2) There is very little opportunity for misrepresentation of the source of conch and lobster between Turneffe Atoll and Lighthouse Reef. This was also confirmed through the survey with a probability approaching 90%.

Our survey does not support the possibility that the decline in Turneffe's fishery is related to a decrease in effort. In fact, the opposite may be true.

Additionally, and perhaps most importantly, long term fishers at Turneffe observe a level of decline consistent with the Fisheries Department statistics.

In summary, it appears that the Fisheries Department's landings data is relatively accurate and that there was a significant decline in the Turneffe Atoll commercial fishery between 2004 and 2009. – both in actual landings and relative to other fishing areas in Belize. Aside from a strong consensus in the survey that illegal fishing is a major issue, this analysis does not attempt to draw conclusions about the reasons for the decline.

References

Belize Fisheries Department. Turneffe Landings Data 2004 – 2009.

Belize Fisheries Department. Fisheries Statistical Report 2009

Turneffe Atoll Trust Survey of Turneffe Atoll Fishers by Dwight Neal. October, 2011