

VI. FOCUS ON MONITORING

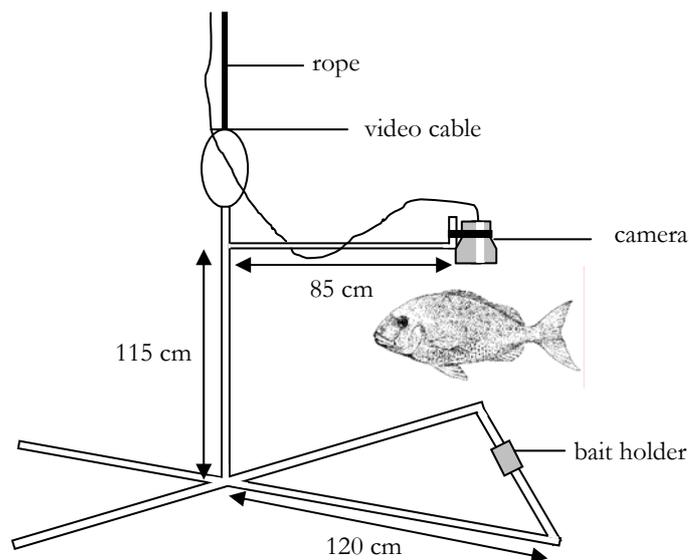
One of the objectives for the establishment of any marine reserve is to develop scientific research that monitors changes that take place over time and compare these with areas outside the reserve. Below are two of the monitoring programmes at Te Whanganui-A-Hei Marine Reserve.

Snapper and blue cod monitoring

Researchers are trying to determine whether reduced fishing pressure inside the marine reserve has led to increased diversity, relative abundance and size of snapper and blue cod. They are using two different techniques to assess this.

Vertically-oriented underwater video camera over a bait station.

A vertically oriented underwater video camera (linked via cables to a monitor and video recorder) is placed above a horizontal quadrat containing a bait station. The camera is deployed for 30 minute periods, during which all species within the quadrat area are identified and counted. The size of blue cod and snapper is determined from measuring images calibrated in relation to marks on the quadrat.



Strip transect diver survey

The reserve and neighbouring marine areas are divided into six survey areas (three reserve, three non-reserve). Each of these survey areas is further divided into three sites. Within each site, three divers undertake studies of three 25m x 5m transects, giving nine replicates per site.

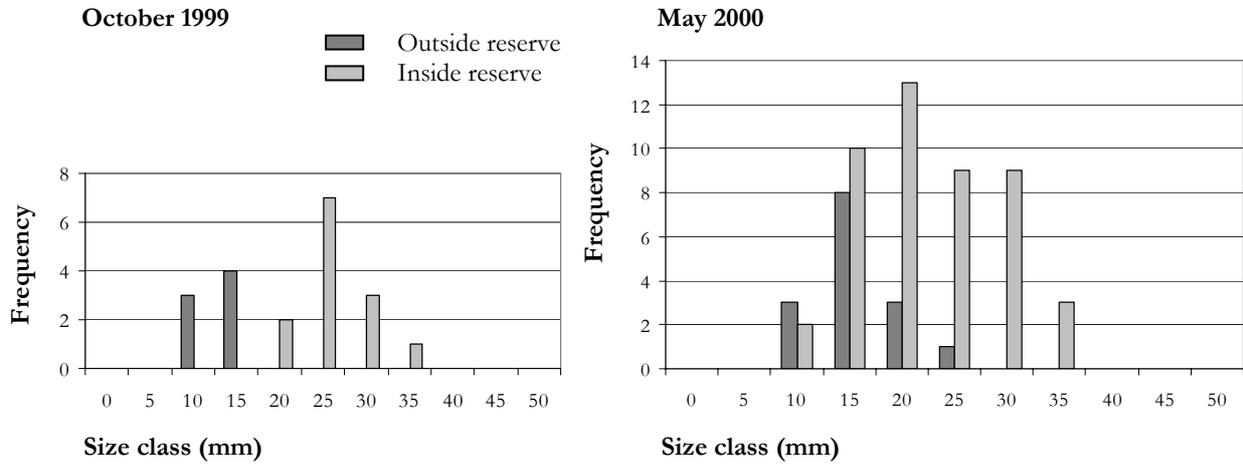
A diver fastens a fibreglass tape to the substratum, then swims 5m before starting the fish count - to avoid sampling fish attracted to the diver.

The diver continues swimming until the tape is 30m long and counts all fish visible 2.5m either side of the tape. The lengths of blue cod, snapper and red moki are estimated to the nearest 5cm.

Where certain schooling species are too numerous to count, numbers are estimated in hundreds or recorded as a school.

Fish species observed outside transects are recorded as present.

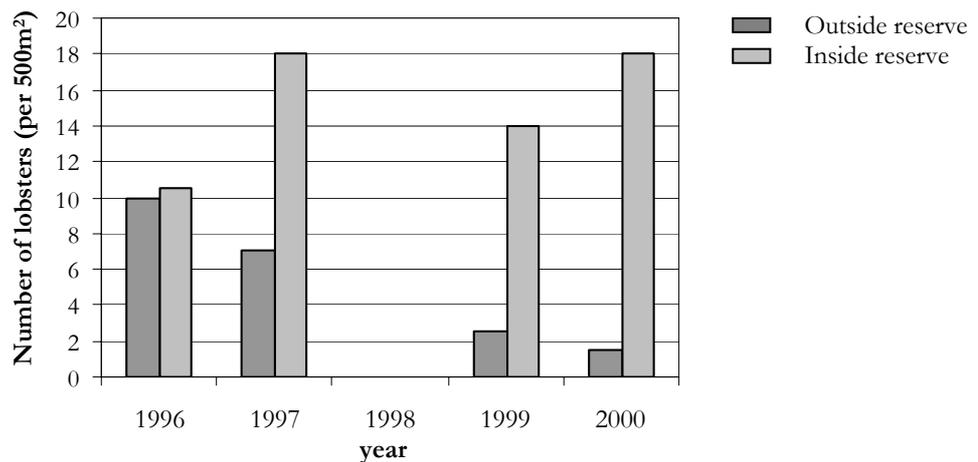
Size frequency distributions of snapper inside and outside Te Whanganui-A-Hei Marine Reserve



Use your own observations to compare the abundance of blue cod and snapper studied in the reserve, with areas outside the reserve. For example, the areas at the eastern end of Hahei beach around Hereherataura Peninsula, or at any of your favourite non-reserve snorkelling spots.

Remember what you observe, even write down your observations so you too can monitor changes as you snorkel here in the future.

Number of lobsters found inside and outside Te Whanganui-A-Hei Marine Reserve between 1996 and 2000

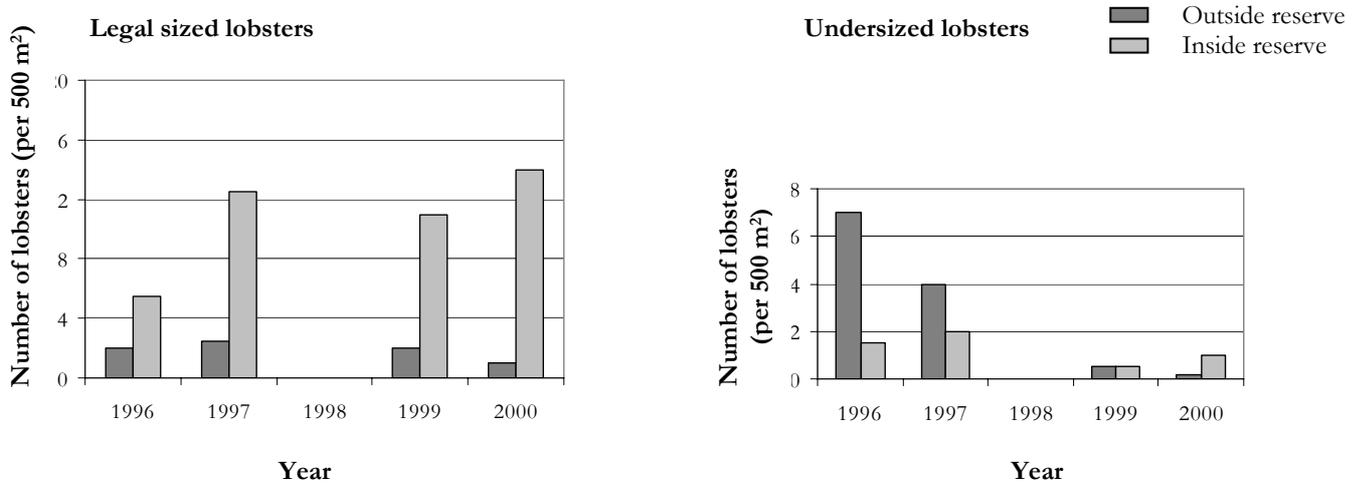


This graph shows how many lobster were found every 0.5 square kilometres, both inside and near the marine reserve during a five year period. Data was gathered from several observations in each of five sites in the reserve and four sites outside.

Discuss the following ideas and come up with some possible answers.

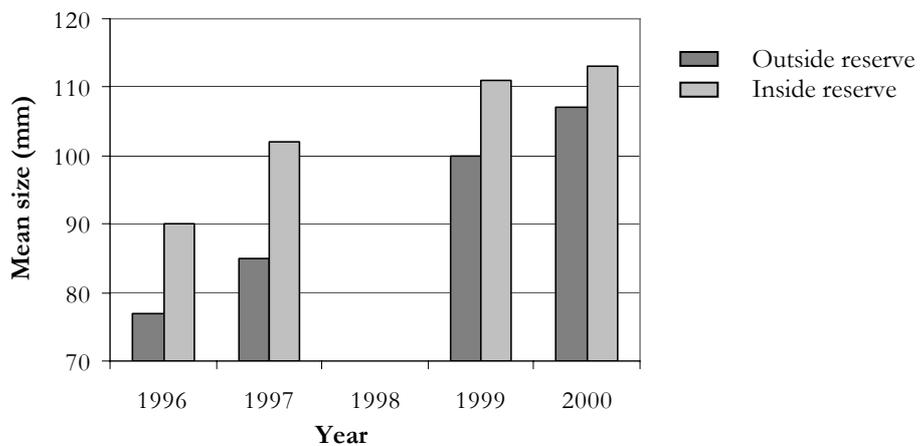
- Why was the abundance of rock lobster the same inside and outside the marine reserve in 1996?
- What is the approximate percentage decrease outside the marine reserve between 1996 and 2000? Why has this happened?
- For Hahei people who have been diving for lobsters since 1990, what difference has the marine reserve made to their recreational fishing?
- What would you predict the numbers to be like both inside and outside the marine reserve in 2004? Why?

Number of legal sized and undersized lobsters observed both within and outside Te Whanganui-A-Hei Marine Reserve between 1996 and 2000



Divers are not allowed to take lobsters with a back (carapace) length less than 95mm. These graphs show definite 'trends' for both legal and undersized lobsters both inside and outside the marine reserve. What are these trends?

Mean size of lobsters observed from both within and outside Te Whanganui-A-Hei Marine Reserve between 1996 and 2000



This graph shows the average back (carapace) length of lobsters at nine sites, inside and outside the marine reserve during a five year period.

Place a ruler across the graph at the legal size mark.

- What does this tell you about the population of legal sized lobsters in the area outside the reserve?
- Look at the way the graph is trending. Do a prediction for sizes both inside and outside the marine reserve for 2004. Check predictions with other students.

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Te Whanganui-A-Hei Marine Reserve Management Committee
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