



Environmental Management Division

Underwater Fish Survey Report

2002-2007



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Executive Summary

Underwater fish surveys were carried out twice a year along eighteen sites on the leeward side of the Island. The surveys were started in October 2002 to gather information about abundance and distribution of fish populations, these continued for five years until April 2007. When surveys resumed in 2011 all species showed a decline mostly bullseye and hardback soldiers.

From all locations surveyed Billy Mays Revenge, a protected area where spearfishing is banned year round had the highest number of target species. Areas close to Jamestown like the Wharf and Banks showed a low distribution of target species. The size range of most grouper recorded were between 16-35cm with very few recorded between 45 - 60cm. The most common size range for hardback soldier were 16-30cm. Most common size range for softback soldiers were between 11-20cm. The size range of most common for bullseye were between 10-25cm.

Total counts of common species showed seasonal variation with a higher abundance in summer compared to winter with cavalier pilot fish being the most abundant species. There was very little variation in distribution of common species between sites.

Total counts of endemic species showed an increase initially before decreasing towards the end of the survey period. The surveys conducted in October 2011 shows the lowest recorded number of endemics. Endemic species were found at all sites surveyed. All 13 sites surveyed has a minimum of nine species recorded. Breakneck Point had the highest distribution of endemics.

The decline in size and abundance of bullseyes had been highlighted by both rock fishermen, divers and spear fishermen. The data gathered from these surveys reinforces this. Long term conservation measures should be put in place for both rock fishermen and spear fishermen which could include a bag limit and size restrictions. The Spearfishing Legislation should be made more robust as a preventive measure for SCUBA divers using lances.

Introduction

Underwater fish surveys were carried out at eighteen sites along the leeward side of the Island (Appendix 1). This is done twice a year in summer (April) and in winter (October). The purpose is to gather information about distribution and abundance of fish populations along the leeward side of the Island. These surveys were started in October 2002 and continued until April 2007 making five complete seasons. There was a gap when no surveys were conducted and then surveys were resumed in October 2011, however no survey was done in April 2012. 197 surveys have been conducted to date.

Methodology

A fifty metre transect line is laid down from a pre-defined position on the seabed. The preferred depth is approximately 10m, with depth being no less than 4/5m and no more than 15m. Two divers swim 2m above the transect line and record all fish species 2m either side. The number and estimated length of each Grouper (*Epinephelus adscensionis*), Hardback Soldier (*Holocentrus adscensionis*), Softback Soldier (*Myripristis jacobus*) and Bullseye (*Heteropriacanthus cruentatus*) is recorded along with the number of Conger (*Gymnothorax moringa*) (Appendix 2 & 4). Target species are species that are heavily targeted by all fishermen. The abundance of 13 endemic and 12 common species (species that are commonly found worldwide) are recorded using pre-defined abundance groups (Appendix 2, 3 & 5).

Data

Data Reliability

GPS positions and land marks above and below the water were consistently used to start and finish at the same place at all locations. Concrete blocks were later used to mark the start and end of survey sites underwater. When conducting surveys in 2011 after an absence of four years the majority of blocks were located intact in the correct location.

From 2005 initials of divers conducting surveys were recorded. Totals for all surveys for all species were calculated by using an average from both divers' counts. The majority of surveys were conducted by the same two divers. One diver was consistently present for all surveys including the resumption in 2011. A waterproof fish identification guide complete with pictures was also available for divers to reference while conducting surveys. Once the survey had been conducted raw data was transferred from recording sheets (Appendix 4 & 5) into a recording book on site and discrepancies discussed and checked, ensuring reliable data. Due to a large abundance of juvenile Bullseye (10cm in length) in April 2006, data for this species for this survey was disregarded from analysis because of misrepresentation.

Types of Data

Once surveys are completed in the field, all data is then entered into excel. All data is entered by site number starting at the most westerly point and continuing along the coast. The sheet contains meta data from sites (i.e cloud cover, sea state, sea temperature and depth) along with targeted length and abundance data.

Four of the target species are recorded by size increments with a total count also recorded. Size is recorded starting from 10 cm and increasing by 5 cm each time. For the fifth target species (Conger) only a total count was recorded. The 13 endemic species and 12 common species are entered by averages of predefined abundance counts.

Data Analysis

Column graphs were produced for individual target, common and endemic species by location and by year for all years in which surveys were conducted. Line graphs were produced to show totals for target, common and endemic species by year and also by season (summer/winter). Distribution was calculated using percentage and pie charts produced to show distribution of target, common and endemic species. Abundance was calculated per 100m² per year and also per location.

Summary of findings

Target Species Findings

Totals of all five target species show an increase between winter and summer surveys. Numbers remain fairly consistent (from year to year), however Bullseye numbers increased in April 2005. The total for 2006 is very high because at all sites there were lots of juvenile Bullseyes (10cm in size). When surveys were resumed in October 2011 data showed a decline in target species, mostly Bullseye and Hardback Solider. This survey was conducted in the winter which would explain a small summer/winter difference but not the large decline shown by the data (Figure 1). In 2011 two sites were not surveyed.

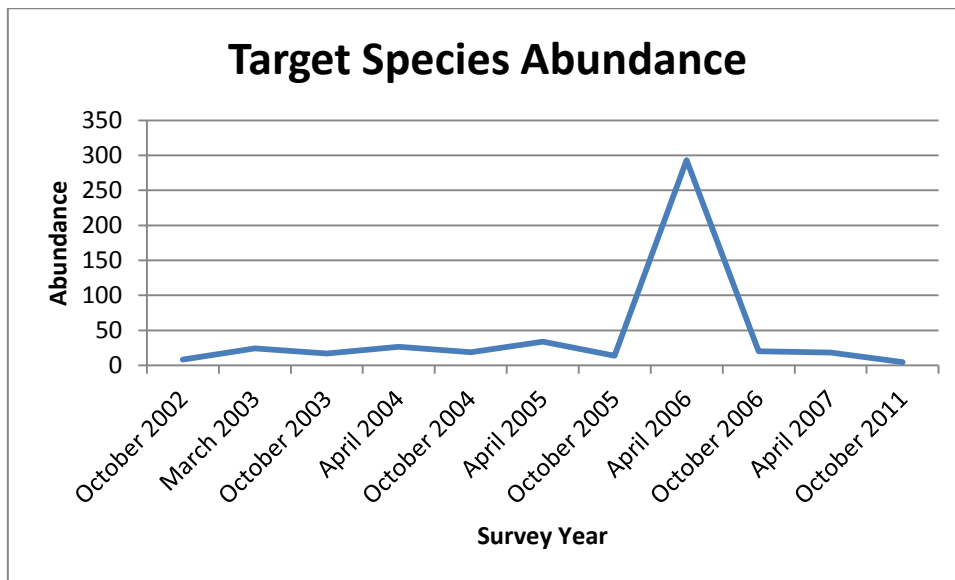


Figure 1: Target species abundance for all sites for each six month survey.

Target Species Distribution

From all locations Billy Mays Revenge has the highest number of target species (21%). This is a protected area where spearfishing is banned year round. Breakneck Point has 12% of the total number of target species. The physical characteristics of this site means there is a lot of cover and hiding places for fish which may explain the high fish abundance. Cavalley Hole with 10% and Black Rocks, Flagstaff Bay 9% are sites that are more difficult for fishermen access. There are a few fishermen who walk to these sites, others would go by boat, however both these activities are weather dependent. Lemon Valley has a distribution of 4%. This site is a popular recreational area and rockfishing is a frequent activity. Middle steps to Thompsons Crane 2%, Middle Steps to Front Steps 1%, Birddown 1% and Banks 1% are very easily accessible with fishermen able to drive directly to the site or very near to the site with only an additional 5-10 minute walk (Table 1 & Figure 2).

Table 1: Distribution (%) of individual target species between the 18 survey sites (without Bullseyes April 2006).

Location	Individual Target Species					Total Target Species
	Grouper	Hardback Solider	Softback Solider	Bullseyes	Conger	
Smooth Rock	6	2	0	2	5	3
Thompsons Valley	7	3	3	3	6	4
Egg Island Main	5	2	3	3	2	3
Cat Island	7	2	0	2	5	3
Billy Mays Revenge	5	19	2	33	4	21
Samphire Patch	7	9	4	3	7	6
Lemon Valley	2	4	2	4	5	4
Cavalley Rock	5	6	5	11	10	8
Breakneck Point	10	17	24	6	8	12
Off Firing Butts	3	4	3	2	5	3
Middle Steps to Thompsons Crane	2	3	2	2	4	2
Middle Steps to Front Steps	1	1	0	0	0	1
Front Steps	1	5	23	3	9	6
Birddown	3	2	1	1	5	1
Banks	6	2	1	0	2	1
Buttermilk Point	7	4	4	2	4	3
Cavalley Hole	9	6	18	12	11	10
Black Rocks, Flagstaff Bay	14	7	6	10	8	9

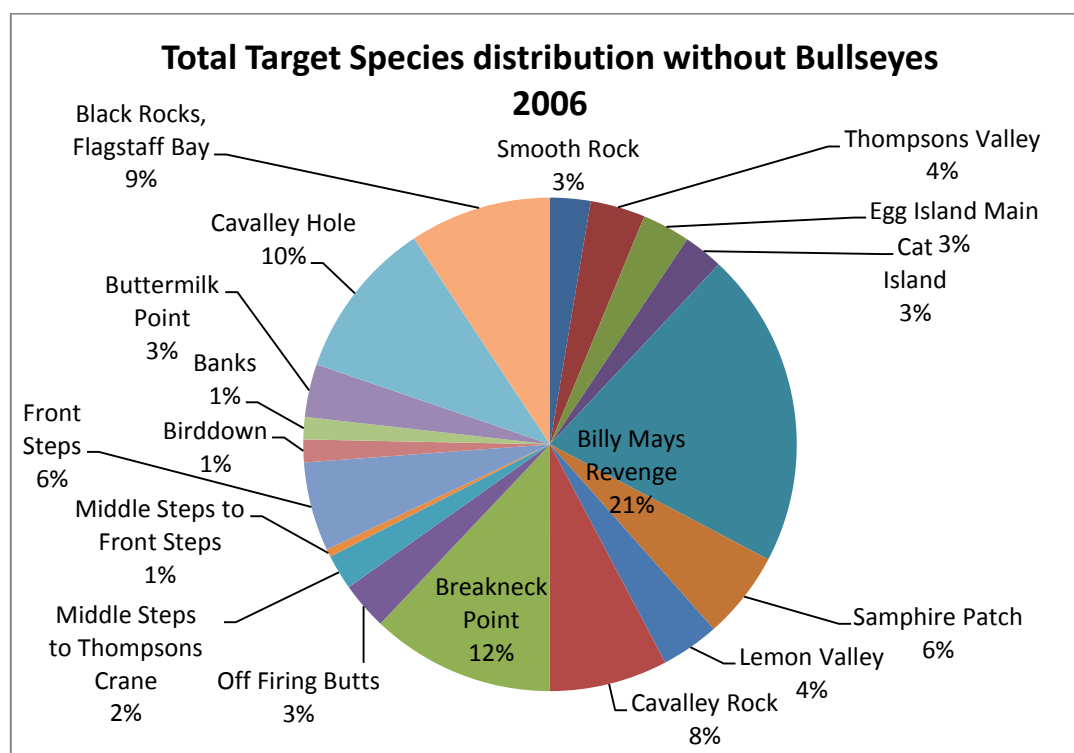


Figure 2: Distribution of Target Species as a percentage by site.

Target Species Size

Four of the five Target species are recorded in 5cm increments. The size range of most Grouper recorded was between 16-35cm with very few Grouper recorded between 45 - 60cm. There is only one record of a Grouper 55cm at Black Rocks, Flagstaff Bay and one record of a Grouper 60cm seen at Breakneck Point. Black Rocks, Flagstaff Bay and Breakneck Point consistently fall in the top three sites for highest abundance of Grouper for the various size increments. Lemon Valley, Middle Steps to Thompsons Crane, Middle Steps to Front Steps, Front Steps and Birddown are all sites that consistently have the lowest abundance of Grouper of various sizes recorded (Table 2).

The size range 16-30cm was the most common for Hardback Solider, however Hardback Soldiers were found up to 40cm (four records). Billy Mays Revenge and Black Rocks, Flagstaff Bay closely followed by Cavalley Rock and Breakneck Point consistently are the top three sites for abundance of Hardback Soldiers for various size increments. Cat Island, Birddown and Banks have the least Hardback Soldiers of various sizes. (Table 3)

Most Softback Soldiers recorded were between 11-20cm, however Softback Soldiers were recorded up to 35cm (two records at Billy Mays Revenge). Front Steps, Breakneck Point and Cavalley Hole are the sites with the most Softback Soldiers of various sizes. Cat Island, Egg Island Main, Lemon Valley and Banks are sites that consistently have low counts of Softback Soldiers. Other than a single encounter of a Softback Solider 10-14 cm in length, no Softback Soldiers were recorded at the site Middle Steps to Front Steps during the surveys (Table 4).

The size range of most of the Bullseye recorded was between 10-25cm, however Bullseye were recorded up to 35cm (at Billy Mays Revenge). Sites that consistently have the highest amount of the various size of Bullseye are Billy Mays Revenge, Cavalley Hole and Black Rocks, Flagstaff Bay. Sites that consistently have the lowest counts of various sized Bullseye are Banks, Samphire Patch, Off Firing Butts, Middle Steps to Thompsons Crane and Front Steps (Table 5).

Table 2: Comparison of abundance of grouper by size increments between sites.

Grouper			
Size Increments	Three sites with highest abundance	Three sites with lowest abundance	No grouper Recorded
10cm	Samphire Patch Breakneck Point Black Rocks, Flagstaff Bay	Lemon Valley Egg Island Main Front Steps	Smooth Rock
15cm	Banks Buttermilk Point Cavalley Hole	Middle Steps to Front Steps Front Steps Smooth Rock Egg Island Main Cavalley Rock	
20cm	Breakneck Point Black Rocks, Flagstaff Bay Cavalley Hole	Middle Steps to Front Steps Lemon Valley Middle Steps to Thompsons Crane Birddown	
25cm	Cavalley Hole Black Rocks, Flagstaff Bay Cat Island	Middle Steps to Front Steps Front Steps Lemon Valley Middle Steps to Thompsons Crane	

Grouper			
Size Increments	3 Highest sites	3 Lowest Sites	None Recorded
30cm	Black Rocks, Flagstaff Bay Cavalley Hole Breakneck Point	Middle Steps to Thompsons Crane Front Steps Middle Steps to Front Steps Birddown	
35cm	Black Rocks, Flagstaff Bay Breakneck Point Cavalley Hole Smooth Rock	Lemon Valley Middle Steps to Thompsons Crane Birddown Off Firing Butts	Middle Steps to Front Steps
40cm	Black Rocks, Flagstaff Bay Breakneck Point Cavalley Hole	Birddown Off Firing Butts Samphire Patch Banks	Lemon Valley Middle Steps to Thompsons Crane Middle Steps to Front Steps Front Steps
45cm	Black Rocks, Flagstaff Bay Breakneck Point Thompson's Valley	Banks Cavalley Hole Egg Island Main Cat Island Billy Mays Revenge Samphire Patch	Lemon Valley Cavalley Rock Off Firing Butts Middle Steps to Thompsons Crane Middle Steps to Front Steps Front Steps Birddown Buttermilk Point
50cm	Black Rocks, Flagstaff Bay Breakneck Point	Smooth Rock Thompson's Valley Egg Island Main Cavalley Rock Buttermilk Point Cavalley Hole	Cat Island Billy Mays Revenge Samphire Patch Lemon Valley Off Firing Butts Middle Steps to Thompsons Crane Middle Steps to Front Steps Front Steps Birddown
55cm	Black Rocks, Flagstaff Bay*		
60cm	Breakneck Point*		

*Only record.

Table 3: Comparing Hardback Solider size increments between highest and lowest sites.

Hardback Solider			
Size Increments	3 Highest sites	3 Lowest Sites	None Recorded
10cm	Front Steps Cavalley Rock Off Firing Butts	Samphire Patch Egg Island Main Thompsons Valley	
15cm	Breakneck Point Cavalley Rock Black Rocks, Flaggstaff Bay	Cat Island Smooth Rock Middle Steps to Front Steps Banks	
20cm	Breakneck Point Billy Mays Revenge Cavalley Rock	Smooth Rock Cat Island Birddown Banks	
25cm	Breakneck Point Billy Mays Revenge Samphire Patch	Middle Steps to Front Steps Birddown Middle Steps to Thompsons Crane	
35cm	Black Rocks, Flaggstaff Bay Cavalley Hole Billy Mays Revenge	Egg Island Main Cat Island Cavalley Rock	Lemon Valley Off Firing Butts Middle Steps to Thompsons Crane Middle Steps to Front Steps Front Steps Birddown Banks
40cm	Billy Mays Revenge* Cavalley Hole* Black Rocks Flagstaff Bay*		

*Only record.

Table 4: Comparing Softback Solider size increments between highest and lowest sites

Softback Solider			
Size Increments	3 Highest sites	3 Lowest Sites	None Recorded
10cm	Cavalley Hole Front Steps Breakneck Point	Cat Island Middle Steps to Front Steps Smooth Rock Banks	
15cm	Breakneck Point Front Steps Cavalley Hole	Cat Island Birddown Banks	Middle Steps to Front Steps
20cm	Breakneck Point Front Steps Cavalley Hole	Cat Island Middle Steps to Thompsons Crane Egg Island Main Billy Mays Revenge Lemon Valley	Smooth Rock Middle Steps to Front Steps Birddown
25cm	Breakneck Point Front Steps Thompsons Valley	Cavalley Rock Off Firing Butts Buttermilk Point	Smooth Rock Cat Island Middle Steps to Thompsons Crane Middle Steps to Front Steps Birddown Banks
30cm	Cavalley Hole Front Steps	Egg Island Main Lemon Valley	Smooth Rock Thompsons Valley Cat Island Billy Mays Revenge Samphire Patch Cavalley Rock Breakneck Point Off Firing Butts Middle Steps to Thompsons Crane Middle Steps to Front Steps Birddown Banks Buttermilk Point Black Rocks, Flagstaff Bay
35cm	Billy Mays Revenge*		

*Only record.

Table 5: Comparing Bullseye size increments between highest and lowest sites excluding April 2006 counts

Bullseye			
Size Increments	3 Highest sites	3 Lowest Sites	None Recorded
10cm	Billy Mays Revenge Cavalley Rock Cavalley Hole	Banks Samphire Parch Buttermilk Point	Middle Steps to Front Steps
15cm	Billy Mays Revenge Cavalley Rock Cavalley Hole	Banks Birddown Off Firing Butts Middle Steps to Thompsons Crane	Middle Steps to Front Steps
20cm	Billy Mays Revenge Cavalley Hole Black Rocks, Flagstaff Bay	Middle Steps to Thompsons Crane Banks Front Steps	Middle Steps to Front Steps Birddown
25cm	Billy Mays Revenge Black Rocks, Flagstaff Bay Cavalley Hole	Front Steps Cat Island Off Firing Butts	Middle Steps to Thompsons Crane Middle Steps to Front Steps Birddown Banks
30cm	Billy Mays Revenge Black Rocks, Flagstaff Bay Thompsons Valley	Egg Island Main Samphire Patch Smooth Rock	Cat Island Cavalley Rock Off Firing Butts Middle Steps to Thompsons Crane Middle Steps to Front Steps Front Steps Birddown Banks
35cm	Black Rocks, Flagstaff Bay*		

*Only record.

Common Species

Total counts of Common species showed seasonal variation with a higher abundance in summer compared to winter. Over the period of the surveys since 2002 there has been a gradual decline in total counts of all species combined (Figure 3). Cavalley Pilot fish are the most abundant of the Common species with regular counts within the abundance category of 65 – 256 fish within the transect (200m²). There is very little difference between winter and summer counts of Cavalley Pilot fish at most sites. Most other species are recorded in smaller numbers within the 200m² transect, often with ten or fewer fish recorded. Occasionally up to thirty individuals of the same species were recorded at a site.

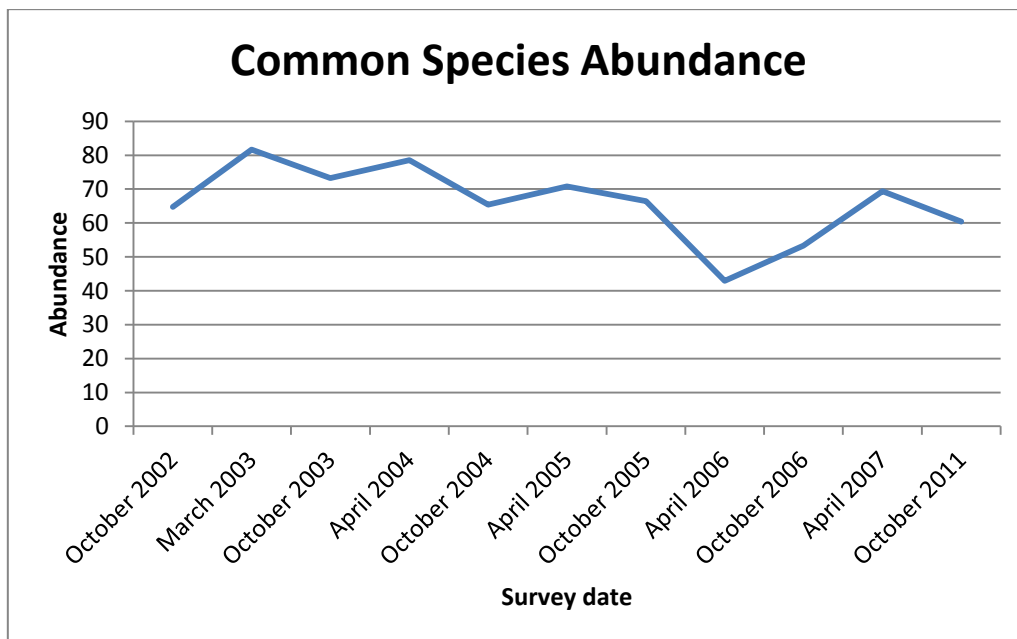


Figure 3: Abundance of all common species per 100m² recorded at all sites for each six month survey.

Common Species Distribution

Unlike target species there is very little variation in distribution of common species between sites. Distribution of species between all 18 sites ranged from 3% to 7%. Thompsons Valley, Cat Island, Billy Mays Revenge, Samphire Patch, Buttermilk Point, and Black Rocks, Flagstaff Bay had the higher distribution of species (7%) whereas Middle Steps to Front Steps has the lowest distribution (3%). Front Steps and Breakneck Point also have a low distribution of 4% (Figure 4).

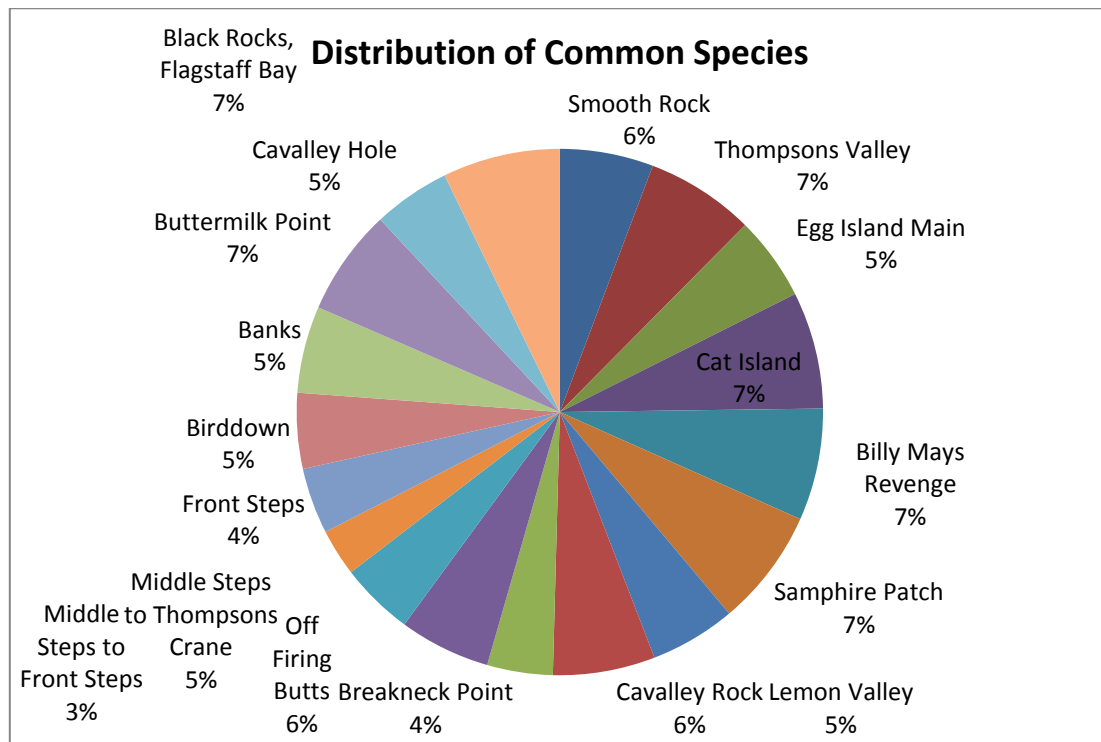


Figure 4: Distribution of Common Species as a percentage by site.

Endemic Species

Total counts of endemic species show an increase between October 2002 and October 2006 before dropping in April 2007 (Figure 5). The survey conducted in October 2011 shows the lowest recorded number of endemics. In March 2006 there were mass deaths of juvenile Cunningfish, with up to 17,000 deaths recorded. Endemic species do not show any seasonal variation in counts unlike that of target and common species.

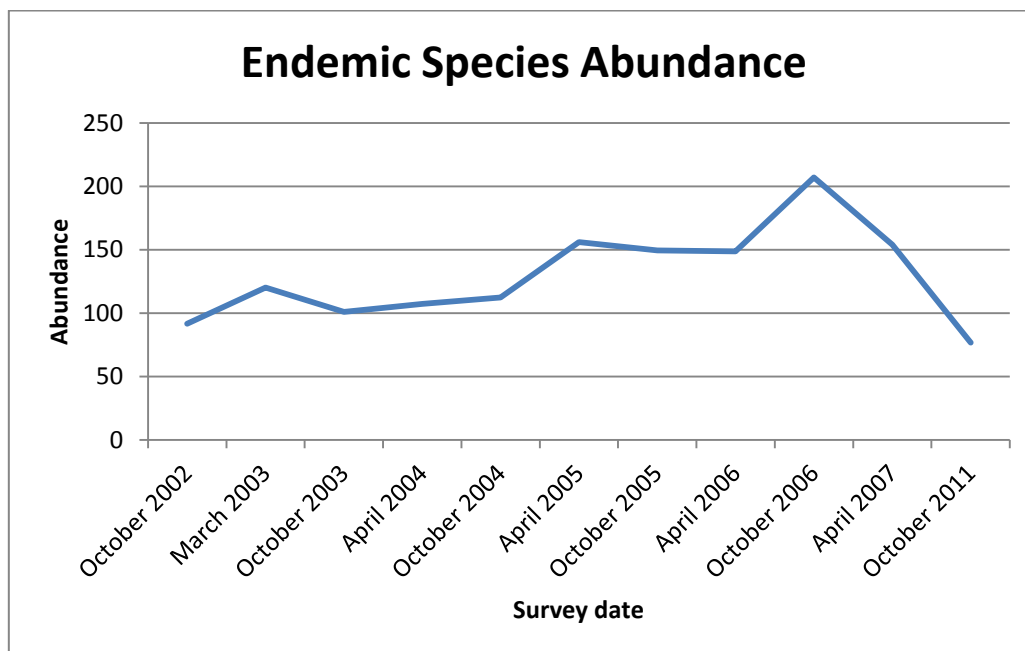


Figure 5: Abundance of endemic species per 100m² recorded at all sites for each six month survey.

Endemic species were found at all survey sites and of the 13 species surveyed for, all sites had a minimum of nine. The Ascension Goby has never been recorded and the Sand Greenfish has only

been recorded at three sites (Table 6). Bastard Cavalley Pilot fish, Cunningfish and Greenfish are the most abundant of all the endemics at all sites, with total counts within the 200m² transect regularly reaching over 100 fish. Other endemic species are encountered in lower numbers of below 35 and most often below ten within the survey transect.

Table 6: Number of different endemic species at each site (from a possible thirteen). AG = Ascension goby, SGF = Sand Greenfish, BCF = Bastard Cunningfish, MRF = Marmalade Razorfish, BFF = Bastard Fivefinger

Site Number	Site Name	No Endemic Species	Unrecorded Endemic Species
1	Smooth Rock	10	AG, SGF, BCF
2	Thompsons Valley	10	AG, SGF, MRF
3	Egg Island Main	11	AG, BCF
4	Cat Island	11	AG, SGF
5	Billy Mays Revenge	10	AG, SGF, MRF
6	Samphire Patch	10	AG, SGF, BFF
7	Lemon Valley	10	AG, SGF, BFF
8	Cavalley Rock	10	AG, SGF, MRF
9	Breakneck Point	11	AG, BCF
10	Off Firing Butts	9	AG, SGF, BFF, BCF
11	Middle Steps to Thompsons Crane	9	AG, SGF, BCF, MRF
12	Middle Steps to Front Steps	10	AG, SGF, BFF
13	Front Steps	11	AG, SGF
14	Birddown	10	AG, SGF, BFF
15	Banks	10	AG, SGF, BFF
16	Buttermilk Point	11	AG, SGF
17	Cavalley Hole	10	AG, SGF, BFF
18	Black Rocks, Flagstaff Bay	12	AG

Endemic Species Distribution

Breakneck Point has the highest distribution of endemics compared to the other sites (11%). This is likely to be due to the reef structure which provides lots of safe areas for fish. In all other areas distribution ranged between 3% to 7%. Middle Steps again falls into the lowest category of 3% (Figure 8).

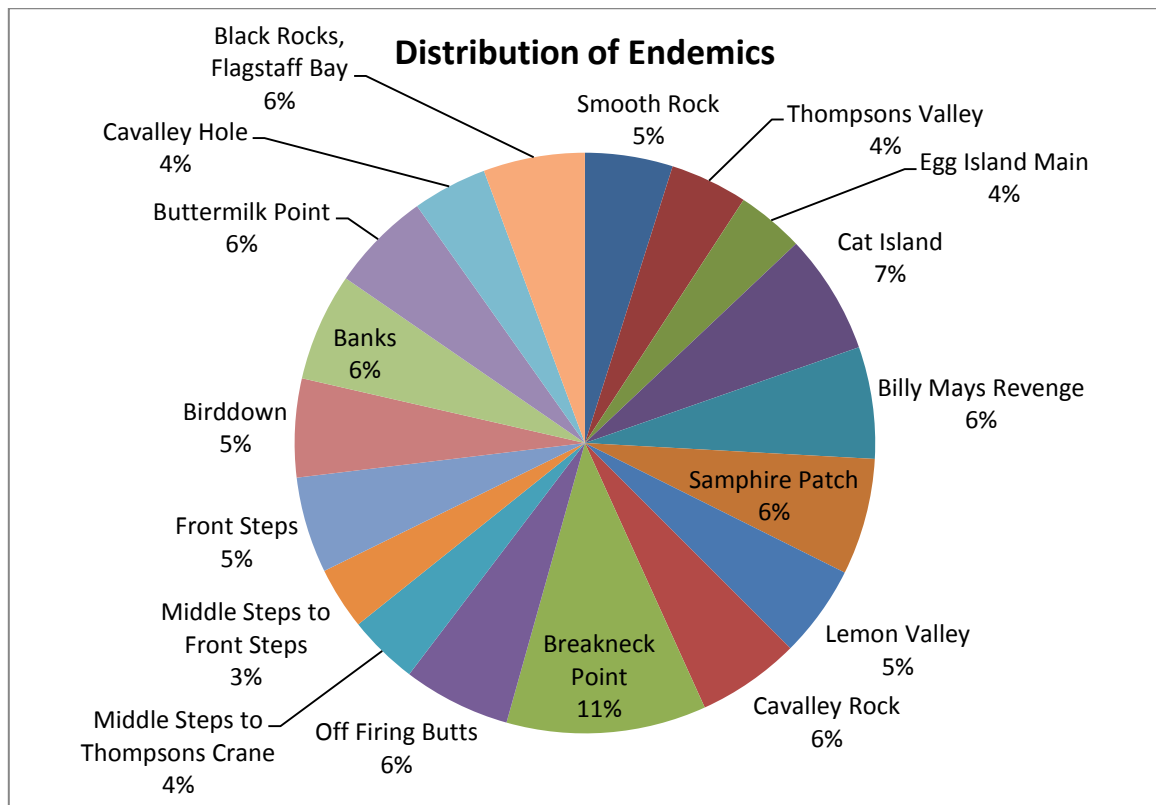


Figure 8: Distribution of Endemic Species as a percentage by site.

Abundance per 100m²

Abundance per 100m² is calculated by dividing the totals fish count for all survey sites for that time period by the number of survey sites conducted i.e. in October 2002 301 target species from 18 sites. This is then divided by two as each transect covers 200m². By calculating abundance per 100m² a true picture of trends can be seen for target, common and endemic species rather than just using totals alone (Figure 9). Endemic species are the most abundant per 100m² but they show a significant decrease in 2011 dropping from 154 in 2007 to 68 in 2011. Target species are the least abundant per 100m² and in 2011 there were four target species per 17 sites conducted which is low considering the abundance of target species has never dropped below ten during all the preceding years except 2002.

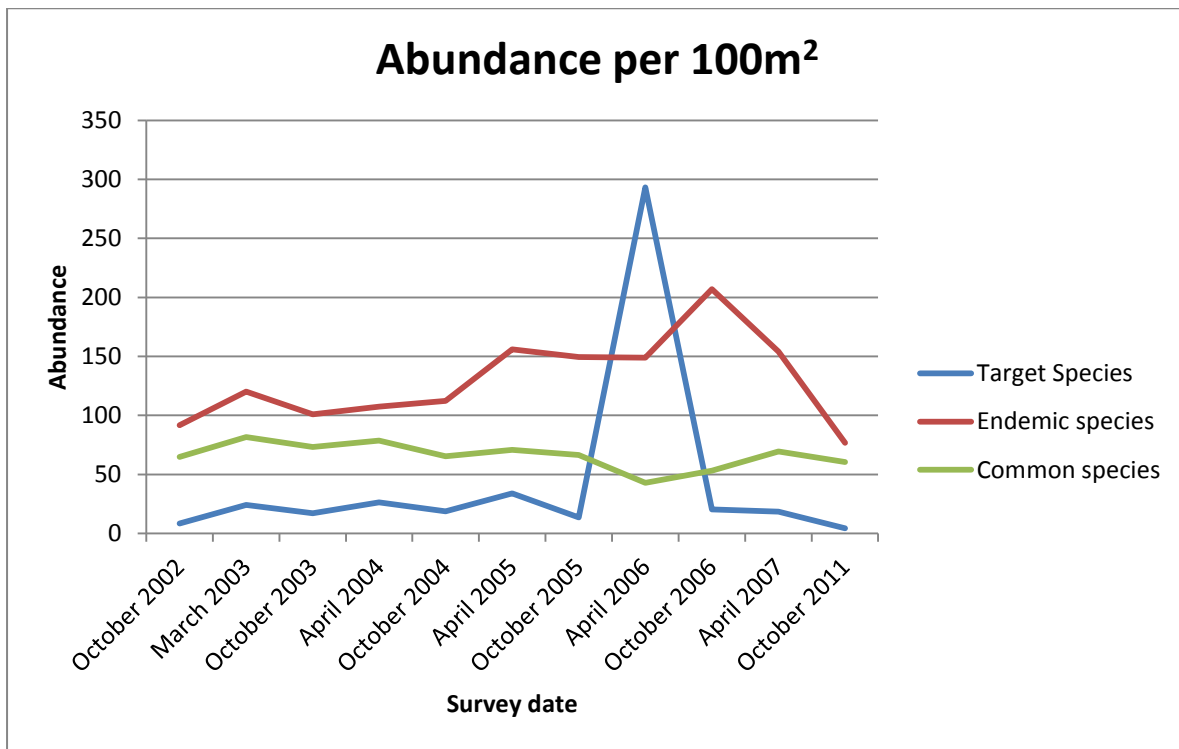


Figure 9: Total abundance per 100m² by number of sites surveyed.

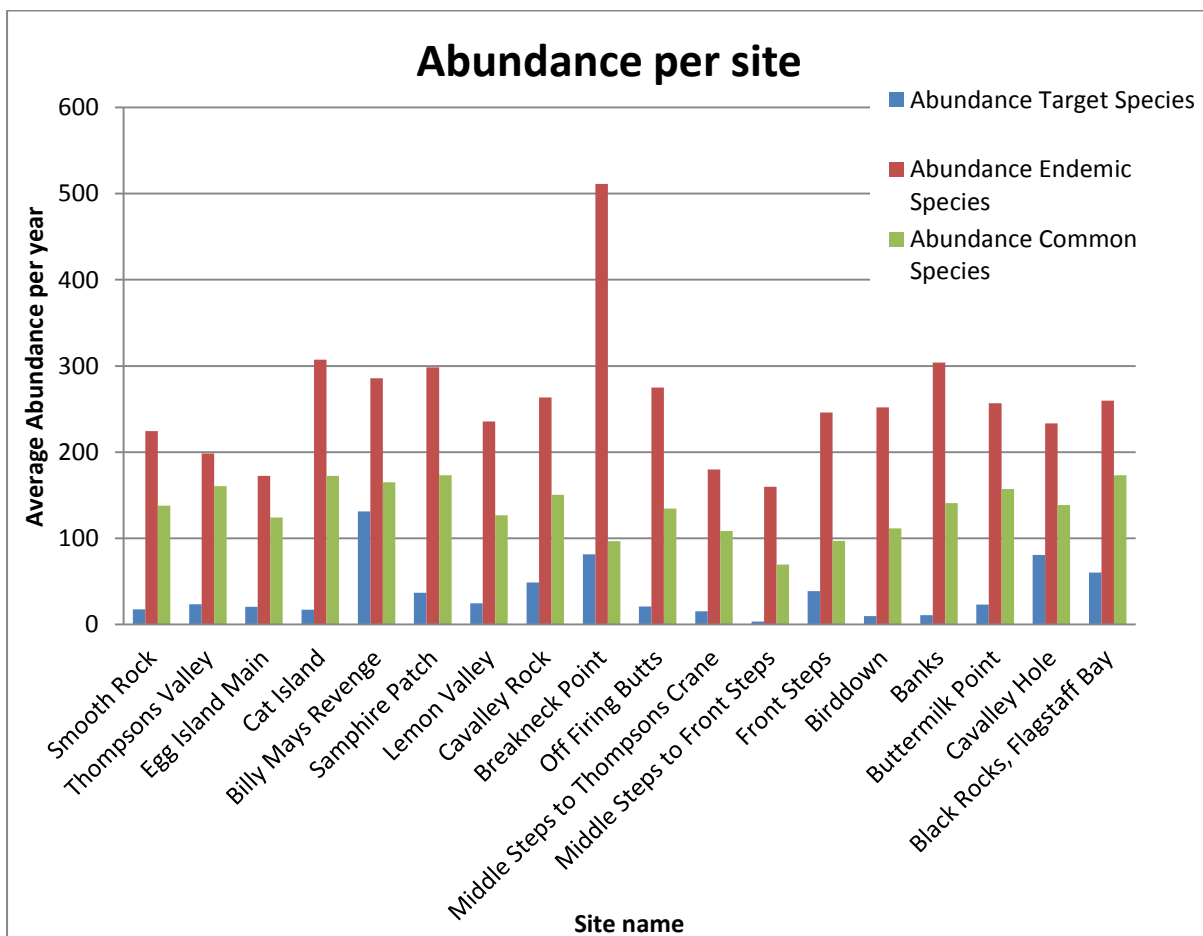


Figure 10: Target, endemic and common species abundance as a percentage by site.

Recommendations

It is recommended that the surveys continue to monitor species abundance over time and examine if the observed decline in Target and Common species continues. The same methodology and, where practical, the same divers should be used for consistency. Surveys should continue to be carried out both during the summer and winter for comparison of seasonal variation. Consideration should also be given to increasing spatial coverage including sites on the Windward side of the Island.

The decline in size and abundance of Bullseyes has been highlighted by both rock fishermen, divers and spear fishermen. The data gathered from these surveys reinforces this. Further study should be carried out to ascertain if Bullseyes and Softback Solider are still declining and possible reasons why (i.e. new fishing methods or gear) as the majority of data used is over four years old. In the interim period appropriate conservation measures should be put in place for rock fishermen and spear fishermen until further data becomes available. Long term conservation measures should be put in place for both rock fishermen and spear fishermen which could include a bag limit and size restrictions. The Spearfishing Legislation requires to be made more robust as a preventive measure for SCUBA divers using lances.

All of the above information should be a priority in the Directorates communication strategy. Lack of awareness from the public and potential investors on the Island could make this fishery unsustainable and possibly lead to its collapse.

Known Threat	Possible Mitigation Measures
Droppers	Ban on using droppers while fish are heavy with roe. Measures could be on the same basis as the current Spearfishing closed season.
Spear Fishermen	A licence is issued for the use of a spear gun. Quota limit be placed on the amount of Bullseyes that can be caught.
SCUBA Divers	The Spearfishing Legislation is made more robust as a preventive measure for SCUBA divers using lances. Currently the legislation relates to the use of a spear gun not the possession or intent to use a spear gun with SCUBA which is a greater deterrent.
Lack of Awareness	Given priory in communication strategy. Particularly with short term contractors and visitors to the Island.

Recommendations from the Report entitled “An Ecological Survey of the St Helena and Ascension Island Populations of the Jack (*Epinephelus Adscensionis*) with a Review of Management Options” are put in place to promote the sustainability of this fishery. These include:

- No increase in the catch rates of groupers in the commercial fishery is permitted.
- That total catch rates of groupers is recorded on a monthly basis with monitoring of a subsample for size and weight so that changes in the average size of harvested groupers over time may be obtained. In addition it is recommended that a sample of 100 otoliths covering the fished size range of grouper be collected on an annual basis.
- A system of at least three no-fishing reserves be established on the north and west coasts of the island, with each reserve including at least one km of coastline and extending seawards to the 100m depth profile. These reserves and adjacent control areas with similar dimensions should be monitored thereafter on an annual basis for grouper abundance and size structure.

- d) Given the fact that most groupers form spawning aggregations it is also recommended that a program to determine the nature, location and frequency of spawning in St Helena groupers be instituted as part of a management plan for this species.
- e) A minimum size limit of 35 cm total length/1 kg weight is imposed to enable the majority of females to live through at least one spawning season.

Raising awareness on the biology of the jack particularly with regard to age, length and reproduction maturity relationship is a large part of successful management of this species.

Related legalisation

Spearfishing legislation Cap 91

Acknowledgements

Thanks are extended to Emma Bennett former Marine Scientific Officer for setting up and conducting surveys and to Graham Sim for his years of continues surveying. Thanks are also extended to all past and present marine staff and volunteers for their involvement in the surveys.

References

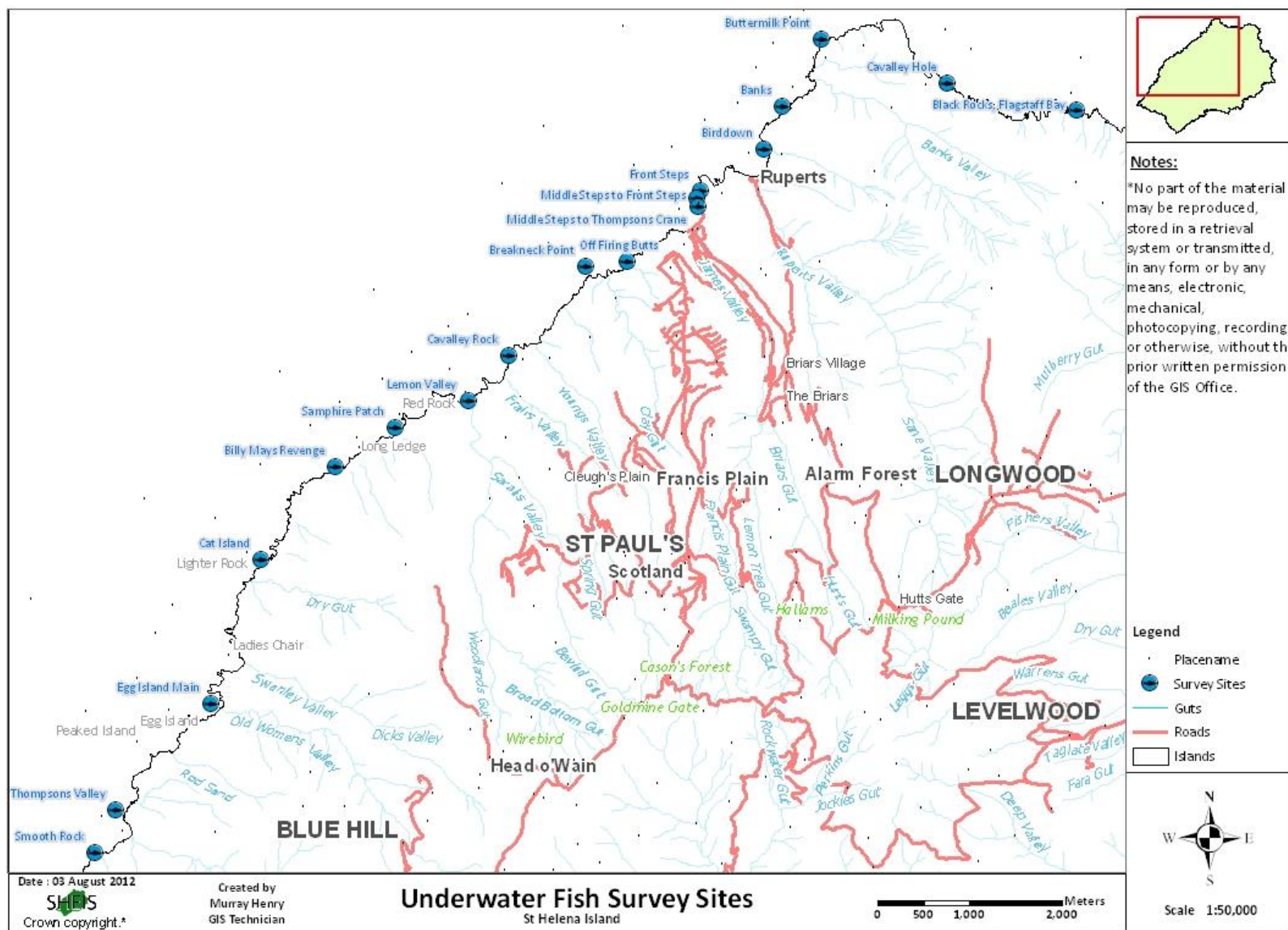
Edwards, A. 1990. Fish and Fisheries of St Helena Island.

Choat, J. H. and Robertson, D. R. 2008. An Ecological Survey of the St Helena and Ascension Island Populations of the Jack (*Epinephelus Adscensionis*) with a Review of Management Options.

Appendix 1 Underwater Fish Survey Sites

Underwater Fish Survey Sites

1. Smooth Rock
2. Thompsons Valley
3. Egg Island Main
4. Cat Island
5. Billy Mays Revenge
6. Samphire Patch
7. Lemon Valley
8. Cavalley Rock
9. Breakneck Point
10. Off Firing Butts
11. Middle Steps to Thompsons Crane
12. Middle Steps to Front Steps
13. Front Steps
14. Birddown
15. Banks
16. Buttermilk Point
17. Cavalley Hole
18. Black Rocks Flagstaff Bay



Appendix 2 Target, Common and Endemic Species With Scientific Names

Table seven: Target, common and endemic species with scientific name

Target Species	
Local name	Scientific name
Grouper/Jack	<i>Epinephelus adscensionis</i>
Hardback Soldier	<i>Holocentrus adscensionis</i>
Softback/Bastard Soldier	<i>Myripristis jacobus</i>
Rock Bullseye	<i>Heteropriacanthus cruentatus</i>
Conger	<i>Gymnothorax moringa</i>
Common Species	
Local name	Scientific name
Blackfish	<i>Melichthys niger</i>
Brim	<i>Kyphosus sectatrix</i>
Cavalley Pilot	<i>Chromis multilineata</i>
Fivefinger	<i>Abudefduf saxatilis</i>
Grannyfish	<i>Amblycirrhitus pinos</i>
Gurnard	<i>Scorpaena plumieri</i>
Old Wife	<i>Diplodus sargus</i>
Rockspear	<i>Synodus synodus</i>
Shitty Trooper	<i>Acanthurus bahianus</i>
Soapfish	<i>Rypticus saponaceus</i>
Trantran	<i>Aulostomus strigosus</i>
Devilfish	<i>Ophioblennius atlanticus atlanticus</i>
Endemic Species	
Local name	Scientific name
Ascension Goby	<i>Priolepis ascensionis</i>
Bastard Cavalley Pilot	<i>Stegastes sanctaehelenae</i>
Bastard Cunningfish	<i>Chaetodon dichrous</i>
Bastard Fivefinger	<i>Chromis sanctaehelenae</i>
Bastard Hogfish	<i>Canthigaster sanctaehelenae</i>
Cunningfish	<i>Chaetodon sanctaehelenae</i>
Greenfish	<i>Thalassoma sanctaehelenae</i>
Hogfish	<i>Acanthostracion notacanthus</i>
Marmalade Razorfish	<i>Xyrichtys blanchardi</i>
Parrotfish/Canaryfish	<i>Bodianus insularis</i>
Rockfish	<i>Sparisoma strigatum</i>
Sand Greenfish	<i>Xyrichtys sanctaehelenae</i>
Red Mullet	<i>Apogon axillaris</i>

Appendix 3 Pre-defined abundance counts

Table eight: Predefined abundance counts

Abundance counts	1
	2-4
	5-16
	17-64
	65-256

Appendix 4 Common Species Recording Sheet

Site name:..... Date:

GPS:..... Depth:..... Time:.....

Visibility:..... Cloud Cover:..... Sea Temp:..... Sea State:.....

Target species/Estimated length	Grouper/Jack	Hardback Soldier	Softback/Bastard Soldier	Rock Bullseye	Conger(no. seen)	Crayfish(no. seen)
1-10						
11-15						
16-20						
21-25						
26-30						
31-35						
36-40						
41-45						
46-50						
51-55						
56-60						

Appendix 5 Abundance Recording Sheet for Endemic and Common Species

Site name:..... Date:.....

GPS:..... Depth:..... Time:.....

Visibility:..... Cloud Cover:..... Sea Temp:..... Sea State:.....

Endemic speciesAbundance Counts	1	2-4	5-16	17-64	65-256		Common speciesAbundance Counts	1	2-4	5-16	17-64	65-256
Ascension Goby							Blackfish					
Bastard Cavalley Pilot							Brim					
Bastard Cuningfish							Cavalley Pilot					
Bastard Fivefinger							Fivefinger					
Bastard Hogfish							Grannyfish					
Cuningfish							Gurnard					
Greenfish							Old Wife					
Hogfish							Rockspear					
Marmalade Razorfish							Shitty Trooper					
Parrotfish/Canaryfish							Soapfish					
Rockfish							Trantran					
Sand Greenfish							Devilfish					
Red Mullet												

