



CCSBT-ESC/0409/08

8.4 CCSBT SCIENTIFIC RESEARCH PROGRAM TAGGING PROGRAM

1. Introduction

At CCSBT8 in October 2001 the Commission agreed to proceed with a tagging program as part of a Scientific Research Program. The structure agreed for the tagging program reflected the recommendations of a Tagging Program Workshop convened in early October 2001.

There are three components to the program:-

- i. a program in the surface fishery in the waters off the south and western Australian coasts to managed by the CCSBT Secretariat
- ii. a longline pilot program to be conducted by Japan in the longline fishery in the western Indian Ocean
- iii. a longline pilot to be conducted by Australia in the east coast longline fishery

The Secretariat has been managing the first component of the tagging program and this paper reports on the third year of activity.

2. General

As designed at the Tagging Program Workshop this element had the following features:-

- tagging of 5-7,000 one year old SBT in Western Australia
- tagging of 8-10,000 two to four year old SBT in South Australia
- fish to be caught using pole and line techniques
- five year timescale

A total budget of \$644,825 was agreed for the third year of the program. \$83,500 was for coordination expenses and \$561,325 for tag deployment costs.

3. Results of tag deployment in surface tagging program

Summary of Results

	Target Number of Tagged fish	Actual Number of Tagged Fish	Active Tagging Days	Tagging Dates	Number of charter boats
Western Australia	5-7,000	5,268	44	10Jan to 4 Mar	1
South Australia	8-10,000	5,009	26	29 Nov to 17 Dec and 8-16 Mar	1
Total	10-15,000	10,277	70		2

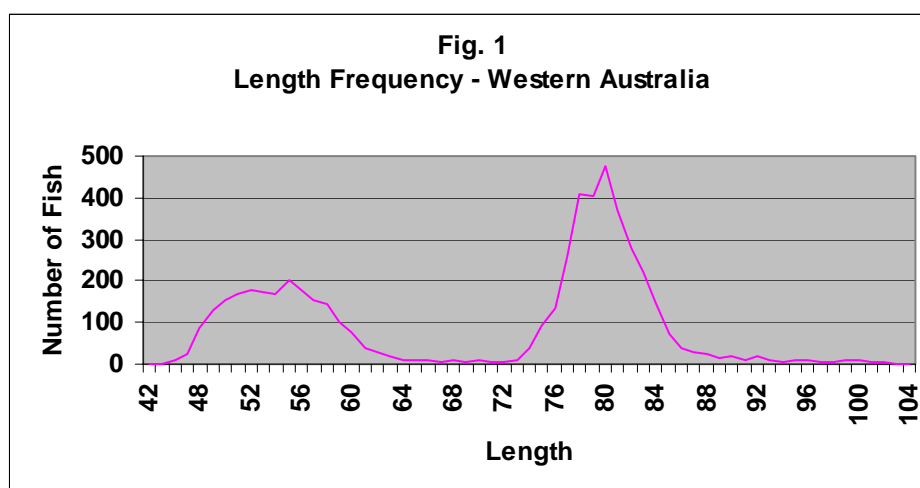
Western Australia

Tagging operations commenced on 10 January 2004 and an initial survey of the juvenile area resulted in fish only being located to the far east in the Daw Island area, south of Israelite Bay. Apart from this main area where the bulk of fish were tagged, some fish were later tagged near Bremer Bay and at Dampier Reef near Esperance.

Tagging success declined in the later stages of the cruise. To the stage when 32 of the available 45 charter days had been used (17 February 2004), 4147 fish had been tagged. Thereafter until the end of the survey on 4 March 2004 only 1121 more fish were tagged, giving a season total of 5268.

The diminished result for the last part of the survey was due to consistent poor weather conditions making it very difficult to sight any surface fish activity and the lack of interest of any fish located in rising to chumming. Those fish that were located were very scattered and not forming schools, and in general those caught had full stomachs. This in combination with the sonar sighting of many patches of bait fish presumably explained the lack of interest.

Approximately equal numbers of 1 year and 2 year old fish were tagged. The length frequency distribution of the tagged fish is shown in Figure 1.



In summary, as for previous CCSBT tagging operations, fish distribution has been very localised and it has only been possible to tag fish basically to the far east of the juvenile distribution range in Western Australia. As for previous tagging seasons other areas were investigated and reports (all negative) were received from other commercial vessels of fish activity elsewhere, especially on the shelf edge. In these circumstances the major effort was to tag fish in the one area where they are known to be and not use charter days in what would probably been a fruitless search throughout the entire area of juvenile distribution.

South Australia

Due to the constraints of vessel availability two tagging sessions were planned, pre season in December, concentrating inshore on smaller fish that are too small to be of interest to the commercial fishery, and post season in March.

For the December session fish were only located in the Nuyts Reef area, although 698 fish were tagged at Yatala on the last of the 17 charter days used. 4914 fish were tagged. The age of the fish ranged from one-year to five years with the largest age group being two year old fish.

After the first leg in December 2003, 13 charter days remained out of the total allocation of 30 days. It was intended to use the remaining charter days to tag more fish after the end of the commercial fishing season, with a consequent reduction in the possibility of large numbers of recaptures by vessels still fishing, and before fish started to move away from the fishing area - that is to start no later than early to mid March.

However the charter vessel was not available until the beginning of April and after a further delay of five days due to weather conditions the charter period commenced on the 8 April 2004. By this time sea surface temperatures had begun to drop, local reports from fishing vessels indicated that few if any fish were being sighted, there were few reports of bait fish being sighted, and sea colour had changed, an indication that water quality was no longer suitable for tuna.

Given these circumstances a systematic search was made of all known spots favoured by tuna in the inshore area between Port Lincoln and the western extremity of the South Australian fishing area (Nuyts Reef) in the hope of locating at least some small patches of resident fish remaining after the departure of the bulk of the fish. No fish were located after spending five days searching. The shelf edge area back to the east was then explored on day six and two very small patches were located. 95 fish were tagged before no more fish responded to chumming efforts.

Day six was the first day when weather conditions were suitable for the spotting plane to survey the entire fishing area (weather throughout the second leg was marginal for spotting surface fish from the vessel and apart from this one day not suitable at all for the plane). The only fish spotted from the plane were several very small patches inshore from the vessel position, and conditions were so marginal that it was not possible to determine exactly what the species was or to estimate tonnages.

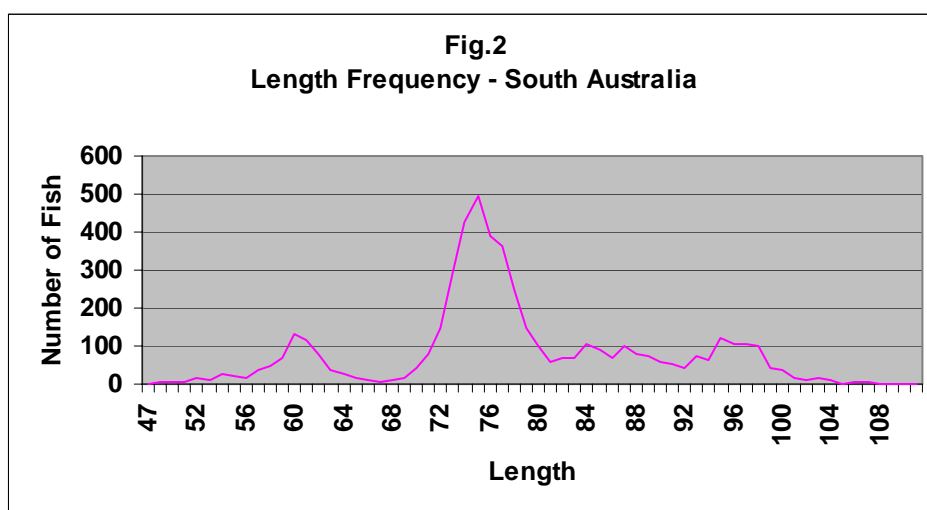
On day seven the above area was investigated and attempts at poling and chumming were made on a large number of small (a dozen fish or less) surface patches, resulting in eight fish being tagged after 5 hours of constant effort.

The next day this same area was re-visited, but no fish were sighted, and the remaining areas where some resident fish might possibly have occurred (as far east as Cabbage Patch and the Neptune Islands) were then examined until the ninth charter day. After this it was obvious

that fish were not available in anything like suitable numbers to achieve any worthwhile result and the decision was taken to terminate the charter.

This was the third season when attempts have been made to tag fish at the end of the fishing season, and all have been relatively unsuccessful. For the 2004-2005 season some change would be beneficial. Options are either to start the second leg in January, with the problems caused by the possible short term recapture of large numbers of tagged fish by the purse seiners, or to endeavour to charter a vessel which would be available no later than early to mid March, that is after the bulk of commercial fishing has ceased and before fish begin to leave South Australian waters.. Some companies do cease fishing operations early in the season, but charter costs could well be higher than those for the present vessel.

The length frequency distribution for fish tagged in South Australia is shown in Figure 2 below.



4. Results of Tag Recovery

A total of 853 fish have been recaptured from the surface fishery tagging program¹. As would be expected, most (777) of these fish were recovered from the sea cages in Port Lincoln tuna farms. 64 fish were recaptured from the wild, including 34 commercial fishing captures, 18 while conducting tagging in the surface fishery, 2 other research captures and 3 captures of uncertain source. The tags of 12 fish were found on beaches.

Attachment A shows the straight line movement pattern for fish tagged in the surface fishery and for fish tagged in the other SRP projects.

Summary information on tag releases and recaptures are set out in Attachment B. The information in Attachment B includes details of all CCSBT tags recaptured including those released in the surface fishery, the two long line pilots and some other minor releases. This information has already been circulated to national scientists by the CCSBT Database Manager.

Attachment C shows recaptures by source.

¹ These are fish that had been reported to the Secretariat as at 9 August 2004. However, there are a significant number of fish that have been recaptured at Port Lincoln which have recently been recaptured, but for which the details have yet to reach the Secretariat.

Considerable effort was made in 2004 in support of tag recovery. These included

- using a private contractor at Port Lincoln to act on behalf of the CCSBT in promoting the return of tags; the collection of data on tag recapture details; and providing the information with the recovered tags to the Secretariat
- maintaining a recovery mechanism with Taiwanese representatives in Cape Town and Mauritius
- using members' fishing authorities to advertise the tag recovery program with vessels at sea
- using recreational fishing associations in Australia to publicise tag recovery by their members
- providing rewards and feedback (usually in the form of recapture certificates that provides a history of the recaptured fish) to people who reported the capture of tagged fish

6. The 2005 Program

The 2005 program will be conducted along the lines of the activity in 2004 unless the Scientific Committee considers an amendment is required. 15,000 fish will be targeted for the 2004-05 season with the same distribution between South Australia and Western Australia.

On the basis of the 2003 and 2004 experiences, it is proposed to bring forward tagging in South Australia to commence in late November/ early December. Because of vessel availability in March in South Australia, tagging is pushed out to the end of March and fish availability is compromised. This proposal should help to increase the number of fish tagged closer to the minimum target of 8,000 in South Australia. The Secretariat will explore chartering a larger vessel which would allow fishing in more difficult weather conditions. To some degree vessel limitations impacted on fishing success. A larger vessel is expected to be more expensive to hire.

Continued emphasis will be devoted to tag recovery mechanisms in 2005.

- At sea publicity will be continued with member support.
- Currently significant numbers of tags are being recovered from the tuna farm operations using a private contractor and this seems to be effective. A concurrent seeding program should assist in quantifying the effectiveness of this arrangement.
- The Taiwanese agent used in Mauritius is active in contacting the Taiwanese fleet for recovery of tags and providing publicity for the program with fishers.
- The situation in Capetown is less clear. The Taiwanese agent has not returned any tags and does not respond to Secretariat attempts at contact. The Secretariat is not sure whether this reflects disinterest or little activity in the port associated with the SBT fishery. It is suggested that a private contractor might be used in 2005 to see if tag return rates can be improved.

- Observers on vessels in the fishery became more active in 2004 and more emphasis will be placed on this source of tag recovery reporting. Up to the time of producing this report, no tags from the surface fishery program have been recovered through observers on any of the longline fleets.

- Effort will be made to have the monitoring programs in Indonesia adapted to tag recovery. This has not occurred to date as it has been judged unlikely that fish tagged in the surface fishery would be present in the spawning ground before now.

A draft budget for 2005 based on a continuation of the original plan for the surface fishery tagging program, is at Attachment D.

Prepared by the Secretariat

Figure 1: Movement of recaptured fish that were tagged in the surface fishery.

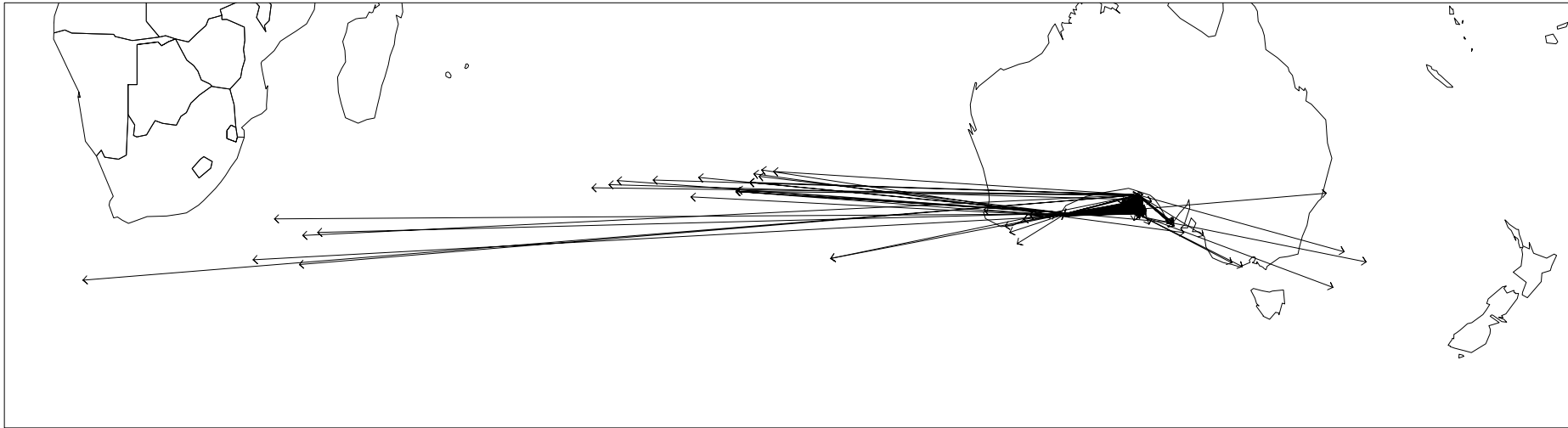
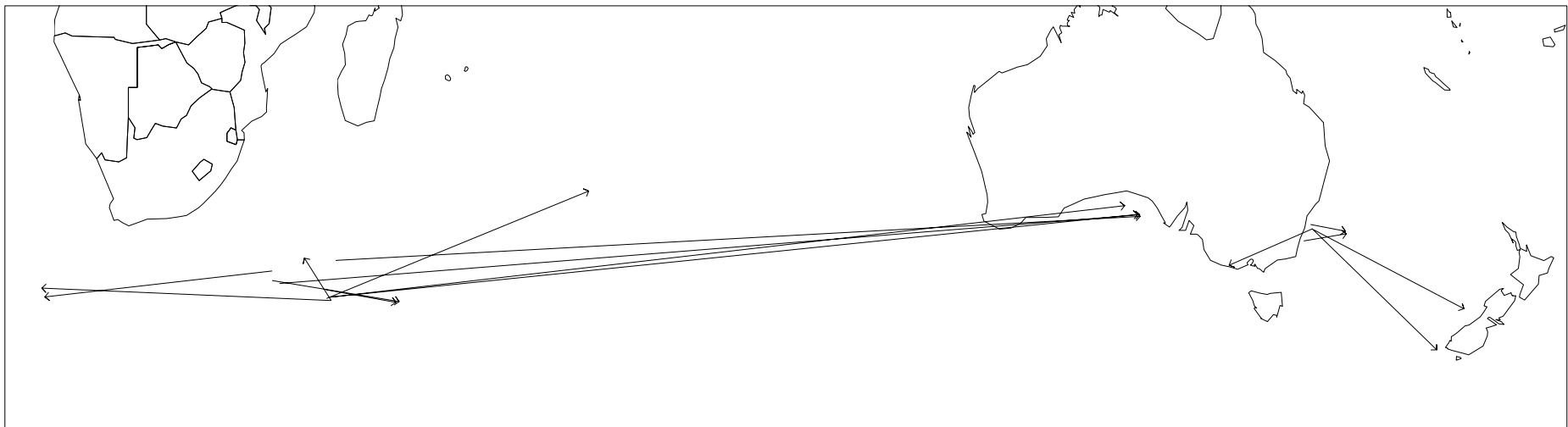


Figure 2: Movement of recaptured fish that were tagged in the Indian Ocean by Japan and the east coast of Australia by Australia.



Summary of the number of recaptures per for each month of tag releases

Notes:

- (1) The season shown is the season starting in 1 December each year and ending at 30 November each year
- (2) Project codes are: SRP_SEED is tag seeding into farms, SRP_TAG is the surface fishery tagging project, SRP_TAGA is the Australian east coast tagging, and SRP_TAGJ is the Japanese Indian Ocean tagging.
- (3) The column "Farming Related Recaptures" refers to captures from the farm in the case of the SRP_SEED project and the wild capture (before to going into the farm) for all other data.
- (4) Similar to "2" above, the data for the fishing seasons columns relate to the farm capture date for the SRP_SEED project and the wild capture date (before to going into the farm) for all other data.

Project Code	Release Area	Calendar Year of Release	Month of Release	Total Number of Fish Tagged	Total Number of Recaptures	Number of Recaptures in 2000/01	Number of Recaptures in 2002	Number of Recaptures in 2002/03	Number of Recaptures in 2003/04	Number of Recaptures in 2004/05	Commercial Fishing Recaptures	Research Fishing Recaptures	Amateur Fishing Recaptures	Farming Related Recaptures	Other Recaptures
SRP_SEED	Area 03	2003	12	26	5	0	0	0	5	0	0	0	0	5	0
SRP_SEED	Area 03	2004	1	39	16	0	0	0	16	0	0	0	0	16	0
SRP_SEED	Area 03	2004	2	50	5	0	0	0	5	0	0	0	1	4	0
SRP_SEED	Area 03	2004	3	90	13	0	0	0	13	0	0	0	0	13	0
SRP_SEED	Area 03	2004	4	19	0	0	0	0	0	0	0	0	0	0	0
SRP_TAG	Area 02	2002	12	51	1	0	0	1	0	0	0	1	0	0	0
SRP_TAG	Area 02	2004	1	34	0	0	0	0	0	0	0	0	0	0	0
SRP_TAG	Area 03 (SA)	2002	4	464	29	0	0	12	17	0	1	2	0	25	1
SRP_TAG	Area 03 (SA)	2002	12	4284	450	0	0	339	111	0	10	2	4	431	3
SRP_TAG	Area 03 (SA)	2003	3	1928	109	0	0	5	104	0	3	0	0	104	2
SRP_TAG	Area 03 (SA)	2003	4	200	7	0	0	0	7	0	0	1	0	6	0
SRP_TAG	Area 03 (SA)	2003	12	4914	54	0	0	0	54	0	1	2	1	49	1
SRP_TAG	Area 03 (SA)	2004	4	95	0	0	0	0	0	0	0	0	0	0	0
SRP_TAG	Area 03 (WA)	2002	1	522	3	0	1	1	1	0	0	0	0	2	1
SRP_TAG	Area 03 (WA)	2002	2	1655	61	0	1	39	21	0	7	1	2	50	1
SRP_TAG	Area 03 (WA)	2002	3	678	6	0	0	2	4	0	0	1	0	5	0
SRP_TAG	Area 03 (WA)	2003	1	1760	60	0	0	7	53	0	4	3	0	52	1
SRP_TAG	Area 03 (WA)	2003	2	3310	61	0	0	10	51	0	5	7	0	48	1
SRP_TAG	Area 03 (WA)	2003	3	1614	8	0	0	2	6	0	3	0	0	5	0
SRP_TAG	Area 03 (WA)	2004	1	2386	0	0	0	0	0	0	0	0	0	0	0
SRP_TAG	Area 03 (WA)	2004	2	2848	4	0	0	0	4	0	0	0	0	0	4
SRP_TAGA	Area 04	2002	7	159	3	0	1	2	0	0	1	1	0	0	1
SRP_TAGA	Area 04	2002	8	59	1	0	0	0	1	0	1	0	0	0	0
SRP_TAGA	Area 04	2003	7	159	1	0	0	0	1	0	1	0	0	0	0
SRP_TAGA	Area 04	2003	8	47	0	0	0	0	0	0	0	0	0	0	0
SRP_TAGA	Area 04	2003	9	5	0	0	0	0	0	0	0	0	0	0	0
SRP_TAGA	Area 04	2003	10	11	0	0	0	0	0	0	0	0	0	0	0
SRP_TAGJ	Area 02	2002	12	3	0	0	0	0	0	0	0	0	0	0	0
SRP_TAGJ	Area 03 (WA)	2003	1	1	0	0	0	0	0	0	0	0	0	0	0
SRP_TAGJ	Area 03 (WA)	2003	2	29	0	0	0	0	0	0	0	0	0	0	0
SRP_TAGJ	Area 08	2003	1	3	0	0	0	0	0	0	0	0	0	0	0
SRP_TAGJ	Area 09	2001	11	119	2	0	2	0	0	0	2	0	0	0	0
SRP_TAGJ	Area 09	2001	12	251	6	0	1	5	0	0	4	0	0	2	0
SRP_TAGJ	Area 09	2002	1	11	0	0	0	0	0	0	0	0	0	0	0
SRP_TAGJ	Area 09	2002	10	36	0	0	0	0	0	0	0	0	0	0	0
SRP_TAGJ	Area 09	2002	11	79	1	0	0	1	0	0	0	0	0	1	0
SRP_TAGJ	Area 09	2002	12	203	2	0	0	1	1	0	1	0	0	1	0

The following table outlines the proposed budget for 2005 together with a comparison with estimated outlays in 2004.

Expenditure Type	2004 Estimate \$	2005 Budget \$
Coordination Expenses		
- Tag purchase	27,000	34,000 ¹
- Tag rewards	35,000	45,000 ²
- Advertising material	-	8,000 ³
- Promotion expenses	-	5,000 ⁴
- General administration	10,000	8,000 ⁵
Total Coordination Expenses	72,000	100,000
Tag Deployment Expenses		
- Tag placement contract	229,825	240,000 ⁶
- Vessel charter	312,050	348,750 ⁷
Total Deployment Expenses	541,875	588,750
Total Expenditure	541,875	591,750

¹ Budget will allow purchase about 37,000 tags (for double tagging the following: 10000 fish in South Australia, 7000 fish in Western Australia, 500 seeded into farms, 500 fish by Japan and 500 fish by Australia).

² Assuming minimum objectives are achieved, 2,124 tags should be returned (on the basis that 77% of fish are returned with both tags) and \$42,480 (assuming about \$20/reward which is typical) will be required. We have rounded this up to \$45,000 in the hope that we will achieve slightly more than the minimum objective.

³ New advertising material will be developed and provided to fishers and other sectors of the industry. Costs reflect the experience of the original printing of publicity material.

⁴ This budget is for the placement of advertisements in fishing industry publications in member countries. This was provided for in 2004 but was not undertaken.

⁵ The budgeted amount includes provision for freight and mailing costs for reward materials. It also includes provision for design costs for new artwork.

⁶ Represents a 5% increase to cover price increases and some additional materials for the tag deployment activity.

⁷ Calculated on the basis of the number of charter days and vessel hire rates in 2004 plus a provision for cost increases. Charter rates achieved in 2004 are unlikely to be repeated in 2005.