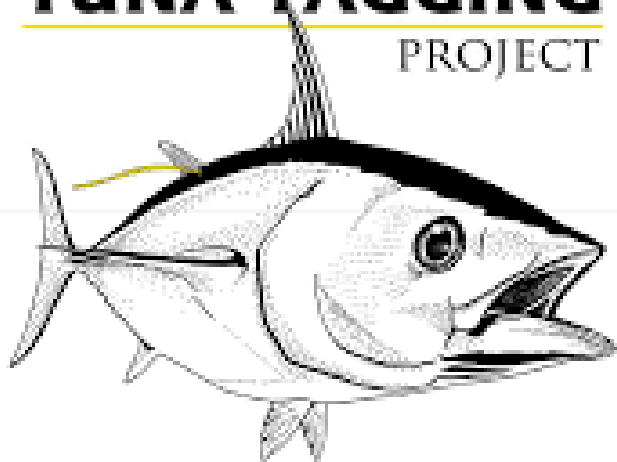


REGIONAL
TUNA TAGGING
PROJECT



INDIAN OCEAN

The IOTTP tag recovery program

*overviews, outcomes,
and recommendations*

Teresa ATHAYDE

Workshop to review the proposed
activities of the IATTC
Regional Tuna Tagging program
2019-2020

January 28-30, 2019

La Jolla, California, USA



INDIAN OCEAN



IOTTP tag recovery program schedule

2005

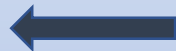


May 2005 - Large scale tagging activities start

June 2005 – PTRO 2 arrives to the Seychelles

Dec 2005 - Contribution Agreement FAO-IOTC and the DEC for PTR expenses of the Project

2006



Jan 2006 – Large scale Publicity and Tag Recoveries materials fully developed

Jan 2006 – RTTP-IO already released 30 000 fish

Feb 2006 – recoveries start to pick up

April 2006 – recoveries/month in SEY out passed 500

Dec. 2006 - recoveries/month in SEY out passed 1000

2007



Feb 2007 – recruit 2nd Tag Recovery Officer

March 2007 - recruit 4 Tag Recovery Assistants

The IOTTP tag recovery program

1. Develop a publicity campaign
2. Develop tag recovery and training materials
3. Establish a tag recovery network in the Indian Ocean
4. Identify and prioritize tag recovery platforms
5. Develop recovery systems and quality control methods
6. Optimize tag recovery process
7. Provide training in recovery data collection and sampling
8. Develop a tag recovery data-base

Publicity

- Giant banners, posters, leaflets, T-shirts, hats, cups
 - Designed by a communication company
 - Translated into 18 different languages
 - Adapted to country and recovery platform
- TV and radio adverts in multiple languages
- Documentary (1 hour)
- Exhibition materials
- Quarterly newsletter
- Lotteries
 - National (US\$ 1000, US\$ 500, US\$250)
 - International (US\$ 2500, US\$ 100, US\$500)

奖励

返回标志牌



标志牌号, 鱼种 黄鳍或大眼金枪鱼)
叉长 厘米), 捕捞日期, 地点, 你的姓名和地址

iotc Indian Ocean Tuna Commission
ctoi Commission des Thons de l'Océan Indien

IOTC, P. O. Box 1011,
Victoria, Seychelles
Tel: 00 248 225494 Fax: 00 248 224364

No AA 0150 IOTC VICTORIA SEYCHELLES REWARD No AA 0150

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No AA 0150 IOTC VICTORIA SEYCHELLES REWARD No AA 0150



قَالَ قَوْمٌ مِّنْهُمْ أَهَٰذَا نَبِيٌّ



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038 1039 1040 1

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Fax: +248.61.08.41 or 22.43.64
Email: rttp@iotc.org

- داسه لکھ جو پور
- داسه لکھ جو ستون
- داسه لکھ جو پور
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- داسه لکھ جو پور



Recovery and training materials

- Standard recovery forms
 - developed by a communication company
 - Standard recovery forms (FR/EN)
 - Simplified recovery forms (FR/EN)
 - Recovery form/leaflet (multiple languages)
- Callipers + Tape measures
- Tag recovery manual
- Training DVD
- Standard PPT presentations

TAG RECOVERY FORM

TAG NUMBER <input style="width: 100%;" type="text"/>	Fish Length <input style="width: 100%;" type="text"/>	Measurment reliability Good <input type="checkbox"/> Bad <input type="checkbox"/>
SPECIES Yellowfin <input type="checkbox"/> Bigeye <input type="checkbox"/> Skipjack <input type="checkbox"/> Other <input style="width: 100%;" type="text"/>		
Weight <input style="width: 100%;" type="text"/> kg Reliability Weighted <input type="checkbox"/> Estimated <input type="checkbox"/>	Fork Length <input type="checkbox"/> First dorsal Length <input type="checkbox"/> Curve Length <input type="checkbox"/> Length along the body curve	
Measuring tool Measuring board <input type="checkbox"/> String <input type="checkbox"/> Caliper <input type="checkbox"/> By eye <input type="checkbox"/> Other <input style="width: 100%;" type="text"/> Tape <input type="checkbox"/>		
Fish state Fresh <input type="checkbox"/> Frozen <input type="checkbox"/> Cooked <input type="checkbox"/>		
Fishing Vessel <input style="width: 100%;" type="text"/> Well <input type="checkbox"/> / Reefer <input style="width: 100%;" type="text"/> Hatch <input type="checkbox"/>		
Date Found <input type="text"/> <input type="text"/> <input type="text"/> Date Returned <input type="text"/> <input type="text"/> <input type="text"/> Date Unloaded <input type="text"/> <input type="text"/> <input type="text"/> Date Caught <input type="text"/> <input type="text"/> <input type="text"/>	Where found Fishing boat <input type="checkbox"/> Fish market <input type="checkbox"/> Reefer <input type="checkbox"/> Cold store <input type="checkbox"/> Cannery <input type="checkbox"/> Other <input style="width: 100%;" type="text"/>	Process when found Fishing <input type="checkbox"/> Sorting <input type="checkbox"/> Transfer <input type="checkbox"/> Ranking <input type="checkbox"/> Unload <input type="checkbox"/> Butcher <input type="checkbox"/> Other <input style="width: 100%;" type="text"/>
Position of catch Latitude <input style="width: 100%;" type="text"/> Longitude <input style="width: 100%;" type="text"/>	Accuracy GPS <input type="checkbox"/> Estimated <input type="checkbox"/>	Or describe fishing area <input style="width: 100%; height: 50px;" type="text"/>
School type Free school <input type="checkbox"/> Log <input type="checkbox"/> Other <input style="width: 100%;" type="text"/> FAD <input type="checkbox"/>		
Fishing method Purse seine <input type="checkbox"/> Gill net <input type="checkbox"/> Pole n Line <input type="checkbox"/> Other <input style="width: 100%;" type="text"/> Longline <input type="checkbox"/> Hand line <input type="checkbox"/> Troll line <input type="checkbox"/>		
Country of recovery <input style="width: 100%;" type="text"/>		
Reward Not given <input type="checkbox"/> Given <input style="width: 100%;" type="text"/>		
Finder Name <input style="width: 100%;" type="text"/>		Signature <input style="width: 100%; height: 50px;" type="text"/>
Address <input style="width: 100%;" type="text"/>		
Comments <input style="width: 100%; height: 50px;" type="text"/>		
Form filled by <input style="width: 100%;" type="text"/>		

Identify and prioritize tag recovery platforms

- 1) A high turnover of fish caught, unloaded, processed and/or transshipped;
- 2) Good possibilities of estimating reporting rate through the implementation of tag seeding activities;
- 3) Good fisheries statistics;
- 4) Easy access
- 5) Good potential to collect high quality data
- 6) Time the tagged fish will be available to the fishery

ID & prioritize tag recovery platforms (cont.)

1st Priority: Purse-seine fisheries

1. FV crew, stevedores, cold-stores, canneries in Seychelles, Mauritius, Madagascar, and Kenya
2. Other countries processing IO fish (mainly Spain)

2nd Priority: Small-scale / artisanal fisheries (pole & line, gillnet, handline, other)

1. Coastal and island states of the West IO (11 countries)
2. Coastal and island states of Central and East IO (4 countries)
3. Coastal countries of the North IO (3 countries)

3rd Priority: Longline fisheries

1. FV crew, stevedores, cold-stores, canneries in Mauritius, Kenya, Tanzania, South Africa, Thailand.
2. Research centers, agents and fleet representatives

Recovery systems and quality control

- Stevedores

1st Phase (2005 – <50 recoveries/month)

1 TRO (>% info collected by stevedores)

Low level or total lack of associated data to recoveries

2nd Phase (2006 – 500 to 1000 recoveries/month)

Fish to be brought to TRO

Preferential reward system

Fish origin bad (seeding)

Increase of tag recoveries and fish size

3rd Phase (2007- up to 1500 recoveries/month)

Tag recovery team (6 people)

Preferential reward system

Collection of unloading and transshipment information

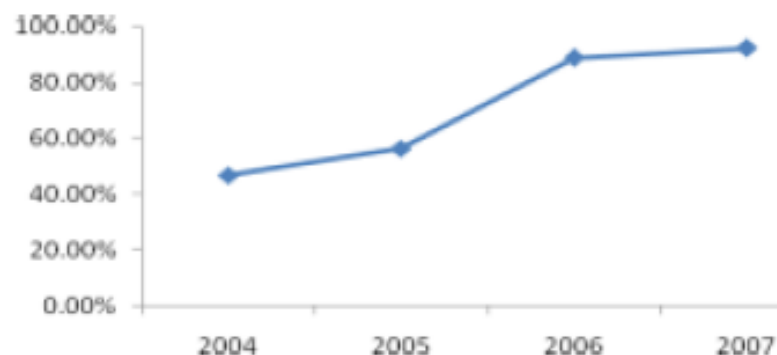


Figure 3 – Tag seeding reporting rates from 2004 to 2007

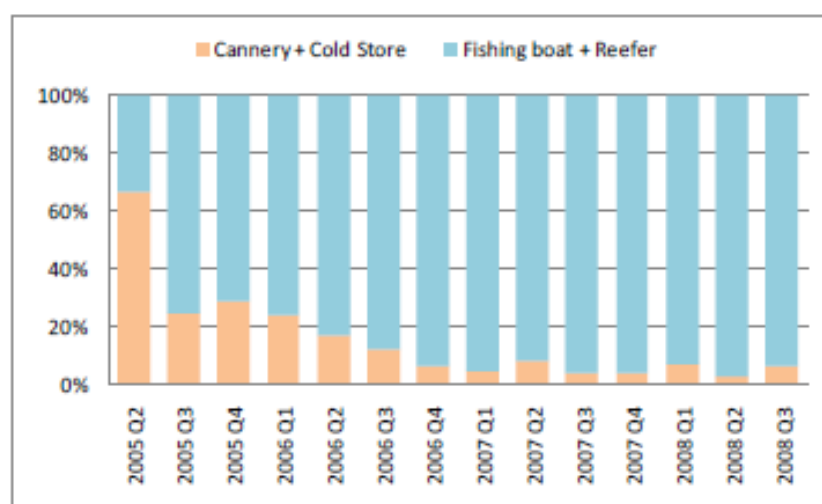


Figure 4- Proportion of quarterly recoveries with the two recovery platforms in the Seychelles

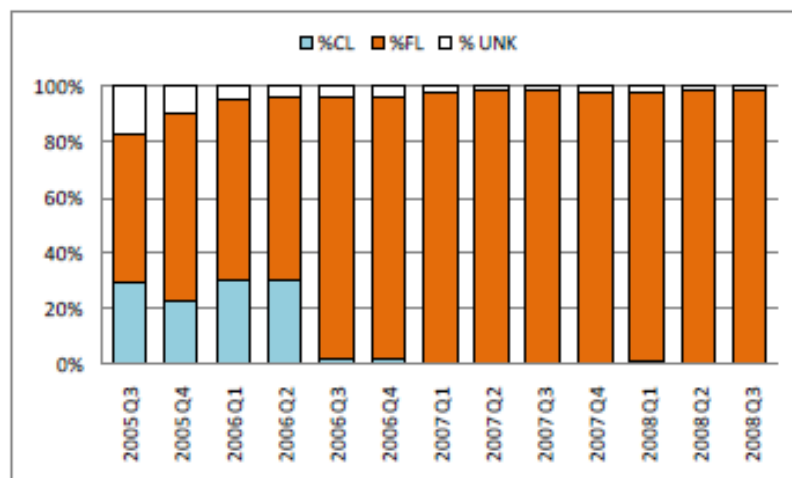


Figure 5- Proportion of quarterly recoveries by length measurement type in the Seychelles

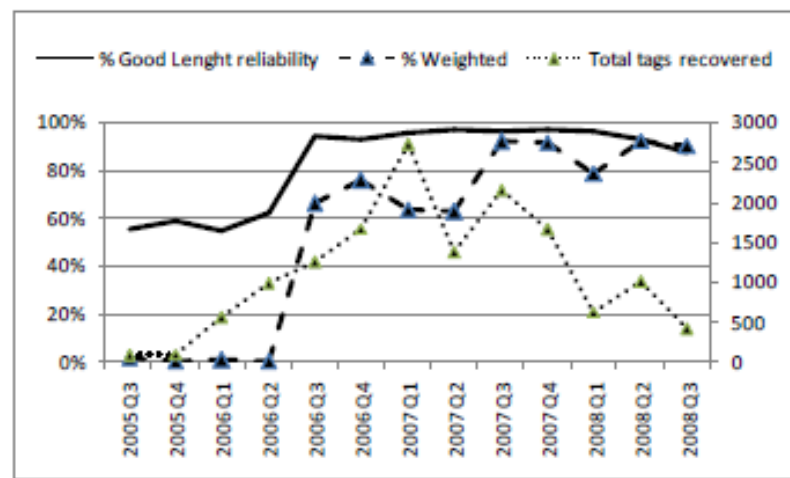


Figure 6- Seychelles stevedore's quarterly recoveries associated to good length / weight reliability

Recovery systems and quality control

- FV crew

1st Phase (2005 – 7 recoveries/year)

1 TRO (>% info collected at sea by FV crew)

length measurement reliability 52%,
fish weighted 24%

2nd Phase (2006 – 1002 tags (9% year recoveries))

Tag recovery forms
given to the crew

Preferential
reward
system

Length reliability
75% / weight
67%

Increase of tag
recoveries and
fish size

3rd Phase (2007- 31% of total recoveries in 2007)

Tag recovery team
(6 people)

Preferential reward
system

Length reliability 86% /
weight 75%, no date 2%, no
position 4%

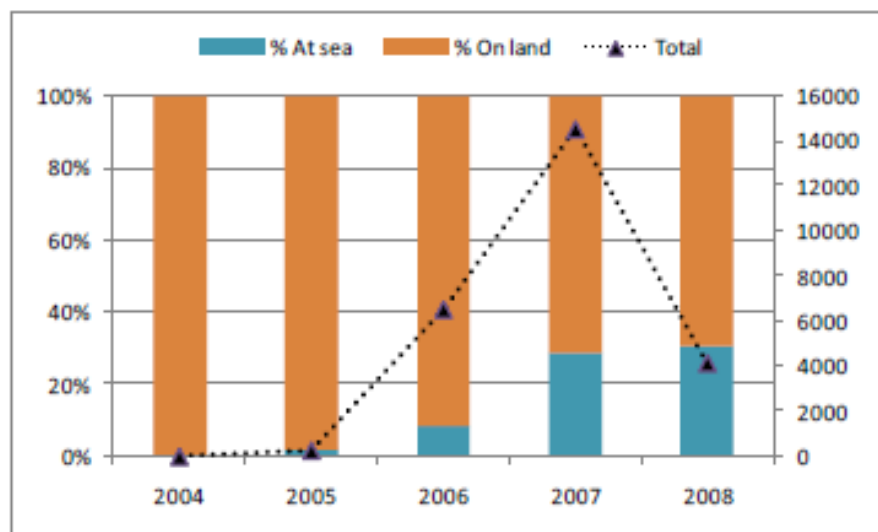


Figure 11- Proportion of "At sea" recoveries versus "on land" recoveries

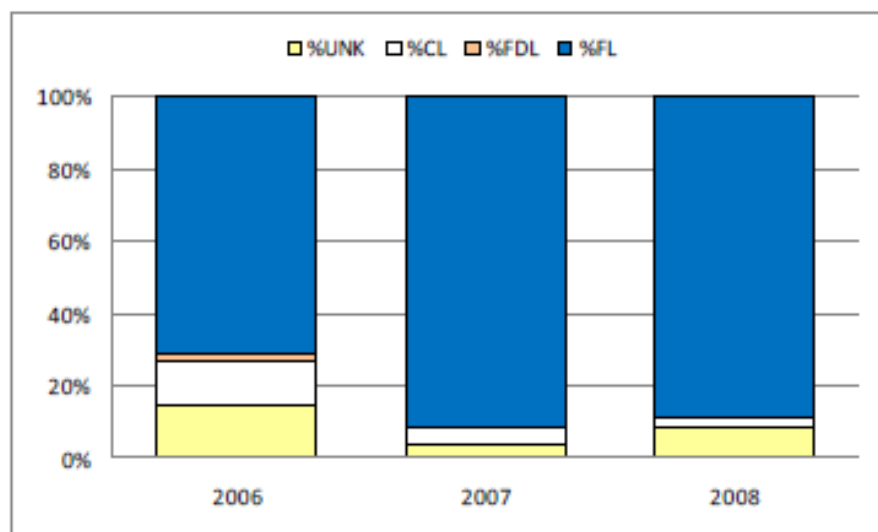


Figure 13- Proportion of length measurements collected "At sea" from 2006 to 2008

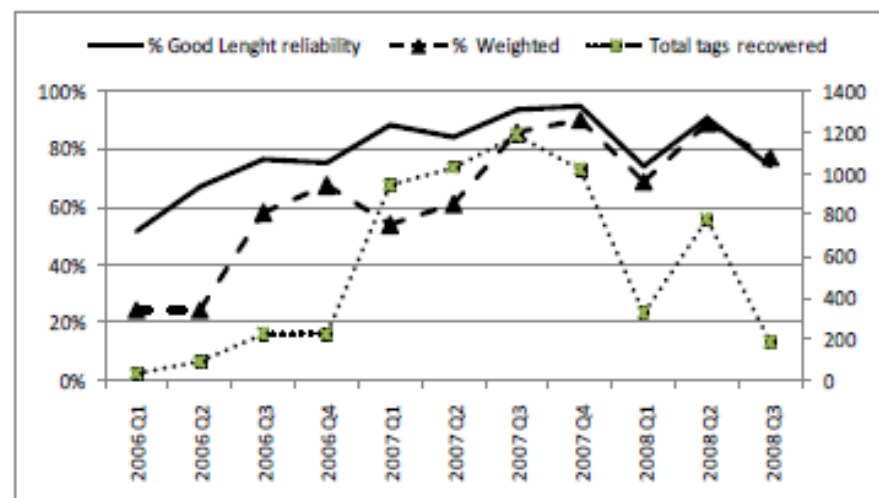


Figure 12- 'At sea' quarterly recoveries associated to good length / weight reliability

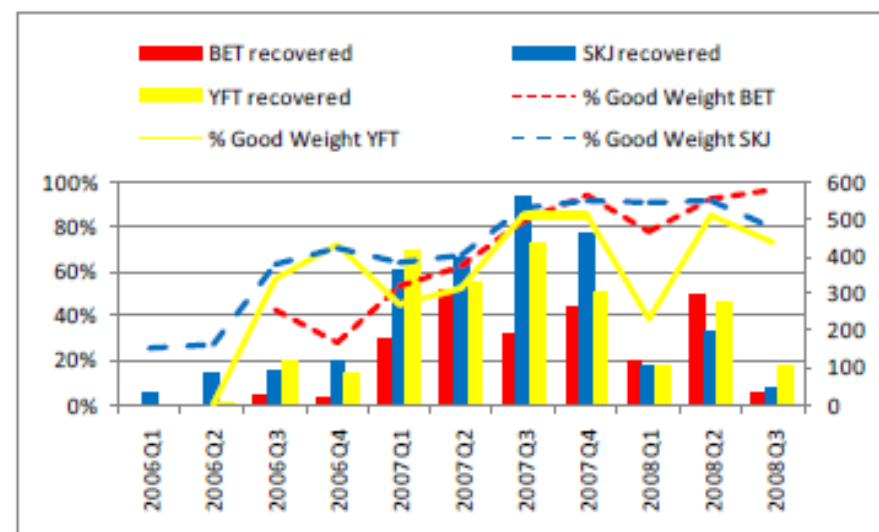


Figure 14- 'At sea' quarterly recoveries associated to good length / weight reliability per species

Reward scheme

- **Cash rewards**

- Conventional tags: US 10
- OTC tags: US 50
- Archival tags: US 300

- **Non-monetary rewards**

- Phone-cards
- Mobile recharges
- T-shirt (multiple colours to cover for cultural differences)
- Caps, Cups

- **Monetary and non-monetary incentives for RO**

- T-shirts special editions, beach towels, cups, laptop briefcases
- Up to 20% of the value of cash rewards

Preferential reward scheme

Preferential reward	Crew	Stevedores	Canneries
Tag + complete high-quality information	Cash rewards T-shirts Phone cards (2x US \$5)	Cash rewards Phone cards (2x US \$5) T-shirts	Phone cards (2x US \$5) T-shirts
Tag + incomplete or low-quality information	Phone cards (US5)	Phone cards (US5)	Phone cards (US5)
Tag only	Hats	Hats	Hats

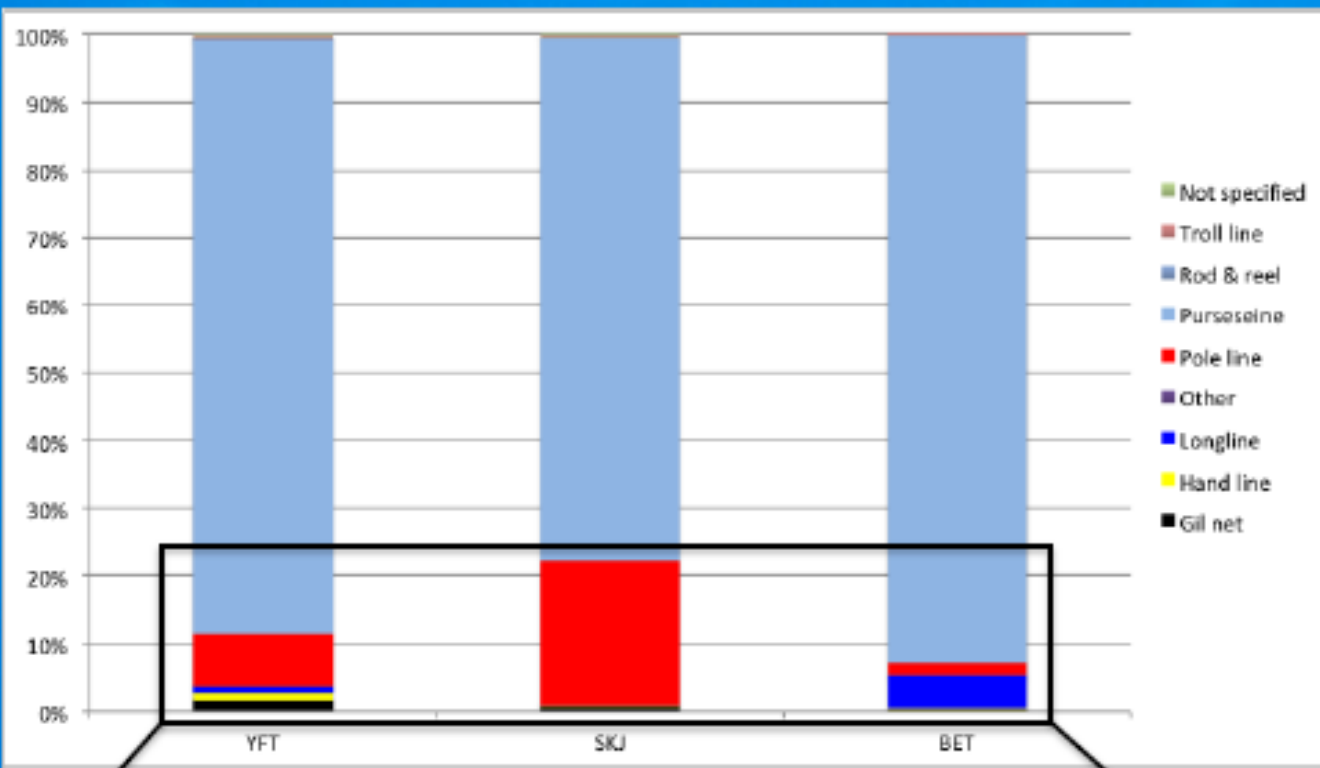
Tag recovery validation and storing

- Tags recoveries reported and revised daily
 - Completeness, quality, validity
- Entered to DB as soon as validated (physical form and tag stored on dossiers).
- Feedback on tag recovery quality provided to ROs and awards allocated
- Tag recoveries entered in DB revised on monthly/quarterly
 - Biological data (length / weight)
 - Data reliability (crossing with tag seeding information, recovery rate, fish origin information)
- Feedback to ROs on tag recovery system performance
- Tag recovery system adapted if needed to increase reporting rates and quality of tag recovery associated data.

TAG NUMBER <input type="text" value="EE454"/> <input type="text" value="07"/> <input type="text"/>		search <input type="text" value="ee454"/> <input type="text"/>	<input type="button" value="Go to tag"/>
Length <input type="text" value="67.00"/> cm <input type="radio"/> length unknown			
Measure type <input type="text" value="FL"/>		Measurement reliability <input type="text" value="Good"/>	
Measuring tool <input type="text" value="Caliper"/>			
Weight <input type="text" value="4.60"/> kg <input type="radio"/> unk		Weight reliability <input type="text" value="Weightec"/>	
Species <input type="text" value="Y"/>		Fish state <input type="text" value="Frozen"/>	
Where found <input type="text" value="Fishing boat"/>		SEX: <input type="text"/>	
Process when found <input type="text" value="Transfer"/>			
Fishing method <input type="text" value="Purseseine"/>		<input type="button" value="Recovered while fishing"/>	
		<input type="button" value="Recovered after capture"/>	
Finder name <input type="text" value="Michel Banane"/>			
Finder's address <input type="text" value="Au Cap"/>			
Country of recovery <input type="text" value="Seychelles"/>		Reward <input type="text" value="50"/>	
		Reward2 <input type="text"/>	
ReceiptNo: <input type="text" value="00737"/>		Date Paid <input type="text" value="#####"/>	
ReceiptNo2: <input type="text"/>		Date Paid2 <input type="text"/>	
Comments <input type="text"/>			

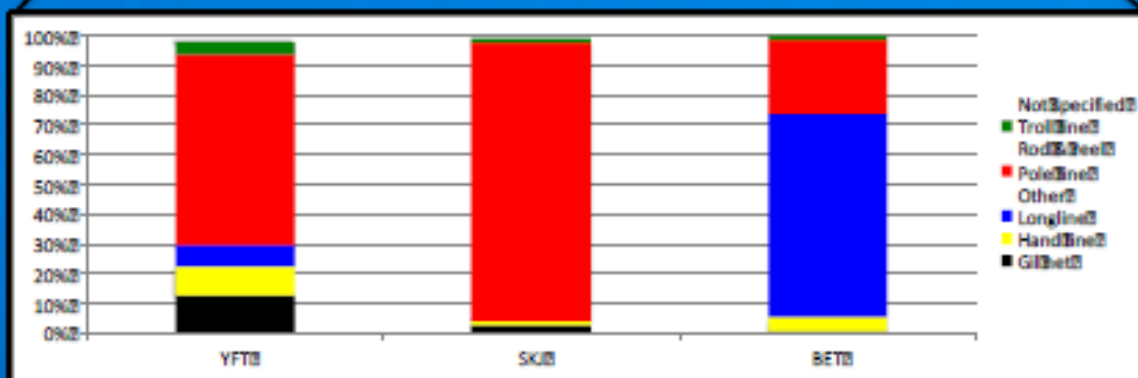
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RECOVERIES: per gear



83.5% recovered
on purse seiner

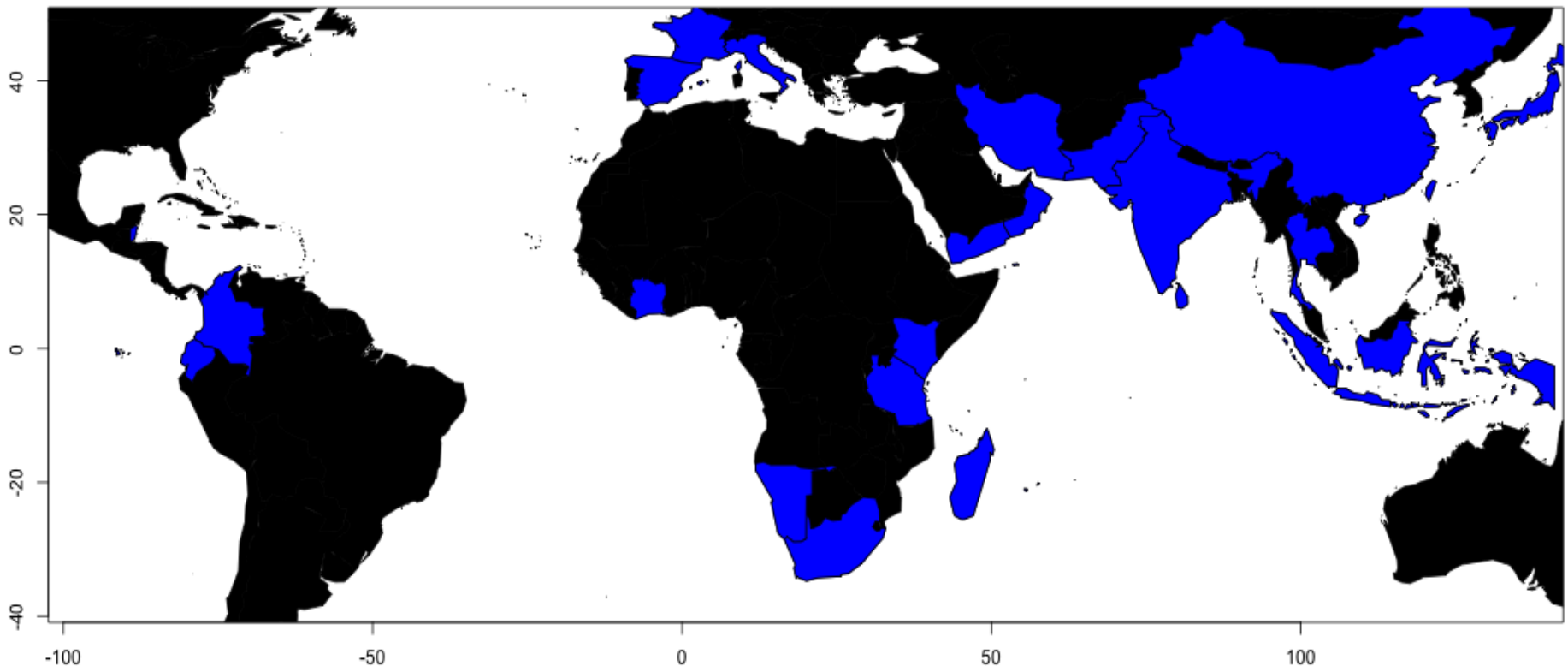
- 13.4% BB
- 1.19% LL



Probably large
under reporting
of the longline
and artisanal
fleets

Recoveries: where?

- Tag recovered from 30 countries
- 25.7% of the purse seine recoveries recovered At sea (while fishing)
- 63.3% of the purse seine recoveries recovered in Seychelles



Locations where the recoveries took place (2008)

	<i>% per location</i>
At sea	26.0
Fish. boat in port	63.5
Cannery	7.9
Reefer	2.1
Cold store	0.2
Fish market	0.1
Other	0.0
unk	0.1

Process involved when the recovery took place (2008)

	<i>% per process</i>
Fishing	26.8
Unload	30.1
Transfer	35.1
Sorting	5.3
Ranking	0.7
Butcher	0.6
Other	0.8
unk	0.6

Lessons learned / Recommendations

- More effort to be placed in developing a recovery strategy previous to the implementation of a tagging program (feasibility and financing studies)
- Increase financial and human resources dedicated to PTR activities (ideal level to be estimated on a program basis)
- Use tag seeding information to verify recovery platforms data reliability and adapt tag recovery/reward schemes accordingly
- Favour the use of preferential reward systems to valorise high quality data recoveries (also allows to reduce program costs)
- Implement an incentive systems to motivate non contractual recovery officers.

Lessons learned / Recommendations

- Closely monitor Tag recovery platforms to rectify quickly any downgrading as things can get wrong very easily.
- Implicate to the extend possible FV officers and crews in the tag recoveries activities (provide them with adequate materials).
- Include Observers (specially the ones deployed in LL or LL reefers) involved into tag recoveries activities. Provide them with an incentive (e.g. % of the value of the recovery reward) to avoid conflicts with the crew.
- Don't underestimate the human and cultural components and the power of socialisation.