



**Australian Government**  
**Border Protection Command**

Customs House  
5 Constitution Avenue  
Canberra ACT 2600  
Australia

24 October 2007

Ms Jackie Morris  
Committee Secretary  
Senate Legal and Constitutional Committee  
Department of the Senate  
PO Box 6100  
Parliament House  
CANBERRA ACT 2600



Dear Ms Morris

Following Senate Estimate hearings in May 2007 the Committee was advised in response to Question on Notice number 105 that a version of the CSIRO report on estimating FFV numbers from Coastwatch surveillance data would be provided to the Committee.

I am pleased to forward a version of the report for the Committee's review.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Tom Marshall'.

Tom Marshall  
Acting Commander  
Border Protection Command

**Attachment:**

Estimating reliable foreign fishing vessel fishing effort from Coastwatch surveillance and apprehension data - Summary of Project Outcomes

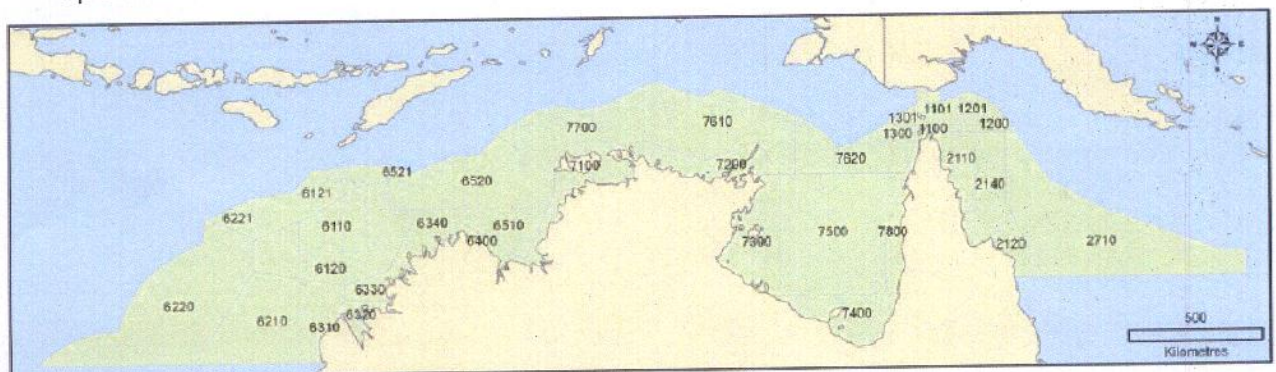
## Estimating reliable foreign fishing vessel fishing effort from Coastwatch surveillance and apprehension data - Summary of Project Outcomes

### Background

1. In 2006, in response to AFMA and Border Protection Command (BPC) requests, CSIRO submitted a research proposal that utilised sightings data to determine a level of fishing effort by illegal foreign fishers in the Australian Fishing Zone (AFZ). Funding for the project was provided by AFMA, the Australian Customs Service and the Australian Government Department of Agriculture, Fisheries and Forestry. The outcomes of this recently-completed project, *Estimating reliable foreign fishing vessel fishing effort from Coastwatch surveillance and apprehension data*, has implications for BPC surveillance coverage and AFMA intelligence processes and will be used in a larger project to determine an overall level of illegal foreign fishing vessel shark catch in Australian waters.
2. This report provides information on the outcomes of that research.

### Methodology

3. The CSIRO project, *Estimating reliable foreign fishing vessel fishing effort from Coastwatch surveillance and apprehension data*, identified four methodologies for assessing fishing effort from sightings data. One of these methodologies was identified as the preferred model. The methodologies used sightings data from 1 January 2005 to 27 June 2006, provided by the BPC, to determine daily numbers of illegal foreign fishing vessels (FFVs) in the AFZ. Apprehensions data provided by AFMA were used to estimate the proportions of different types of boats present over the period. The project looked at 30 areas across northern Australia including areas visited frequently by surveillance aircraft and areas, typically outside the AFZ, visited less frequently (refer to Figure 1). Boats were classified as illegal if they were inside the AFZ. The MoU box is both a legal and illegal region where Type 2 vessels are legally allowed to operate.



**Figure 1 - Geographic boundaries, including the 30 regions included in this study.**

4. Sightings data are highly dependent on the level of surveillance effort and as such, raw sightings data provide unreliable estimates of FFV effort when extrapolated across northern Australia. Scaling the number of sightings by the level of surveillance effort in a region still does not provide an estimate of the actual number of FFVs present.
5. The project developed a method that reliably estimated the number of FFVs across the north on any given day. The preferred method estimates the number of illegal fishing boats present per day in each area and also estimates numbers of FFVs per day that are just outside the AFZ and are therefore not considered illegal. Four alternative estimators, each based on slightly different assumptions, were used as a check for consistency and they showed excellent agreement across regions and months.
6. The project calculates foreign fishing effort as the number of illegal foreign fishing boats present per day in each area. The surveillance and apprehension data used in the project were from 1 January 2005 to 27 June 2006, but there is merit in assessing data up to 30 June 2007 to cover the period from mid-2006 when the number of sightings of FFVs in the AFZ began to decline.

### Results

7. The report shows that:
  - a. the average number of FFVs per day across northern Australia (refer to Figure 2) in January and February is roughly the same for both 2005 and 2006, at around 44 (refer to Table 1);
  - b. the number of FFVs per day in 2005 was highest from September-December, at 57 per day (refer to Table 1), however until the latest data are analysed there is no 2006 comparison available; and
  - c. there is a decrease of almost 50% in the average number of FFVs per day during the first six months of the year between 2005 and 2006 (refer to Figure 2).

**Table 1 – Estimated levels of daily FFV activity based on CSIRO analysis of CW sighting data**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2005	43	44	44	46	34	43	26	45	60	50	44	57
2006	46	42	32	25	21	14	-	-	-	-	-	-

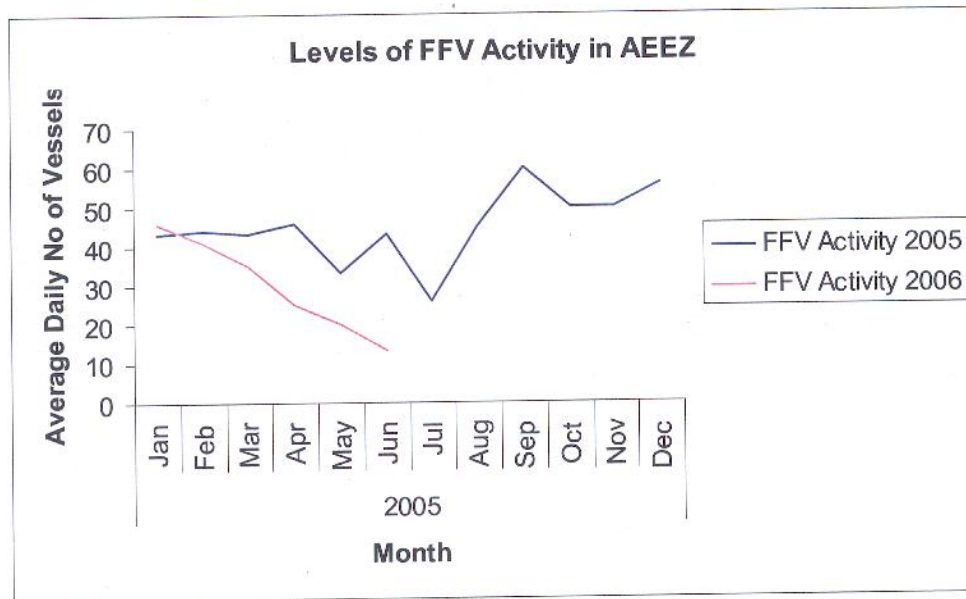


Figure 2 – Levels of FFV activity in the Australian Exclusive Economic Zone.

8. The highest levels of illegal activity was in regions 7500 and 7610 (refer to Figure 1). In these areas, there was a dramatic drop in sightings from April-June 2006, particularly when compared to the same months of the previous year. The daily estimate of FFV for Zone 7 overall decreased from 29.2 boats per day in 2005 to 12.0 boats per day in 2006. The report suggests that a small quantity of the illegal FFV effort may have moved to other regions beyond the AFZ.
9. Analysis of the data across northern Australia has indicated that where surveillance has been increased there has been a clear reduction in the numbers of FFVs per day.
10. It is important to note that the research is unable to provide a robust figure for the size of the FFV fleet as it depends strongly on the duration of each fishing visit and how many visits are made by each vessel in a month, including multiple trips by the same FFV.

### Conclusions

11. While further research is needed to refine or validate some of the results, the project has provided a temporal comparison of FFV fishing effort in different areas. AFMA and BPC are in discussion with CSIRO to extend this work.
12. The outcomes of this project may be used:
  - a. to direct targeted operations and inform surveillance assets;
  - b. to contribute to a larger project that will attempt to quantify the total FFV catch of shark in Australia's northern waters. The results of this project will assist in determining northern shark stock assessments as part of the management of Australia's shark resources; and
  - c. to provide agencies with a formula that would enable quick estimation of the number of FFV effort days.

13. By combining the results of this project with data from other sources, the total IUU fishing fleet may be able to be estimated. To this end, AFMA is collecting additional information to get a clearer understanding of the duration of illegal foreign fishing events in the AFZ.

SENATE STANDING COMMITTEE ON LEGAL AND CONSTITUTIONAL AFFAIRS  
AUSTRALIAN CUSTOMS SERVICE

**Question No. 105**

**Senator Kirk asked the following question at the hearing on 23 May 2007:**

When it is available please provide the Committee with a copy of the publicly available study from CSIRO on Coastwatch surveillance and detention of foreign fishing vessels.

**The answer to the honourable senator's question is as follows:**

A copy of the publicly available study from CSIRO on *Estimating Reliable Foreign Fishing Vessel Fishing Effort from Coastwatch Surveillance and Apprehension Data* will be made available to the Committee by the end of August 2007.