

RESEARCH PLAN FOR THE 2010 IWC/JAPAN JOINT CETACEAN SIGHTING SURVEY IN THE NORTH PACIFIC

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IWC North Pacific Sighting Survey Planning Steering Group

BACKGROUND

During the 2009 IWC SC meeting Japan presented a proposal and preliminary plan for a mid- to long-term research programme involving sighting surveys to provide information for cetacean stock management in the North Pacific. The IWC SC welcomed the initiative and agreed the value of a large-scale, middle-long term integrated research programme in the North Pacific and strongly encouraged this in the context of international collaboration under IWC auspices. The IWC SC recommended that the planning process should start with a review of the current discussions on North Pacific issues within the Committee and a careful examination of available information and identification of gaps in knowledge (IWC, 2009a).

The IWC SC has been conducting the international whale sighting survey program in the Southern Hemispheres every year since 1978/79 Antarctic season as the International Decade of Cetacean Research Program (IWC/IDCR: 1978/79-1995/96 seasons) and as the Southern Ocean Whale and Ecosystem Research (IWC/SOWER: 1996/97-2009/10 seasons) (IWC, 2009a).

To start the organization of this research programme the IWC SC established an intersessional group with the following terms of references (TORs) (IWC, 2009a):

- (1) Review the Committee's issues in the North Pacific and circulate a paper before the next Annual Meeting.
- (2) Review the past and ongoing survey activities and available data in range states from completed pro forma.
- (3) Consider possible line transect survey plan and additional data collection (e.g. photo ID and biopsy) for 2010 season.
- (4) Prepare proposal for intersessional workshop (between SC62 and SC63) on future surveys beyond 2010.

To initiate and review progress of the work related to those TORs, an informal intersessional meeting (IM) was held in Tokyo on 27 September. The IM reviewed progress for each of the TORs listed above. In particular, the IM initiated discussions about medium-long- term objectives of the research programme. Specific groups were identified to complete the works related to TORs 1 and 2 above. Another group was identified to make a proposal for an intersessional workshop to plan for a mid-to long-term programme within the North Pacific (TOR 4 above). The proposal for such a workshop should be developed for presentation at IWC62 (IWC, 2009b).

Regarding TOR 3 above the IM discussed and agreed on a cruise plan for 2010. For several reasons given in the IM report (IWC, 2009b) the IM agreed that the 2010 survey could be considered to be a joint IWC/Japan collaborative venture, although almost entirely funded by Japan.

Here a research plan for the 2010 whale sighting survey in the North Pacific is outlined following the guidelines agreed by the IM (IWC, 2009b).

CRUISE PLAN FOR 2010

Research area and rationale

The cruise will be conducted in summer 2010 in the area between 170°E and 170°W (showed in red in Figure 1) for the following reasons:

- (1) This area has been poorly covered by previous surveys (see Figure 1) and not at all in recent decades thus representing an important information gap for several large whale species;
- (2) For at least some species it spans proposed stock boundaries.

The cruise will be focused on the collection of line transect data to estimate abundance and biopsy/photo-identification data, would make a valuable contribution to the work of the Scientific Committee on the management and conservation of populations of large whales in the North Pacific in a number of ways, including:

- (1) providing information for the proposed future in-depth assessment of sei whales in terms of both abundance and stock structure;
- (2) providing information relevant to *Implementation Reviews* of whales (e.g. common minke whales) in terms of both abundance and stock structure;
- (3) providing baseline information on distribution and abundance for a poorly known area for several large whale species/populations, including those that were known to have been depleted in the past but whose status is unclear;
- (4) providing biopsy samples and photo-identification photos to contribute to discussions of stock structure for several large whale species/populations, including those that were known to have been depleted in the past but whose status is unclear;
- (5) providing essential information for the intersessional workshop to plan for a medium-long term international programme in the North Pacific.

Recent surveys in the Western North Pacific

Figure 1 show the areas in the North Pacific, which have been covered by cetacean scientific surveys in recent years. The proposed research area for the 2010 survey (in red in Figure 1) has not been surveyed previously. Figure 2 shows the planned trackline for the 2010 survey (dotted line). The survey area is divided into northern and southern stratum at 47°N. Black lines represent the boundaries for the US EEZs. Every location within the study area has an equal probability of being sampled. For this aim the starting points of transect lines within the study area were randomized following IWC SC guidelines (Hammond and Donovan, 2004).

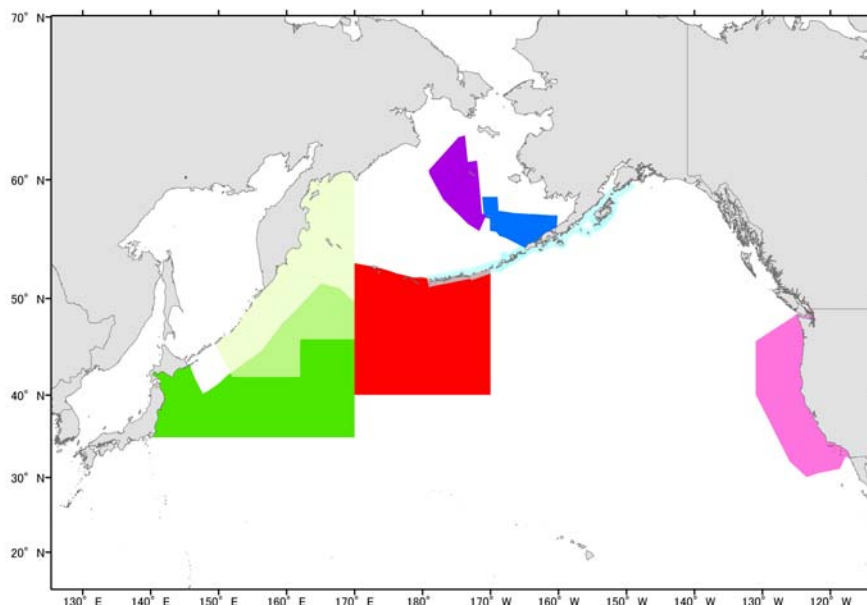


Figure 1. Proposed area for the 2010 sighting survey (in red). Other coloured areas represent surveys conducted in the North Pacific in recent years: in 1999 (purple) and 2000 (blue) by Moore *et al.* (2002), in 2001-2003 (sky blue) by Zerbini *et al.* (2007), in 2001 and 2005 (pink) by Barlow and

Forney (2007), in 2005 (light green) by Miyashita (2006). Sighting surveys have been conducted in the green area since 1994 as a part of JARPN II (Pastene *et al.*, 2009).

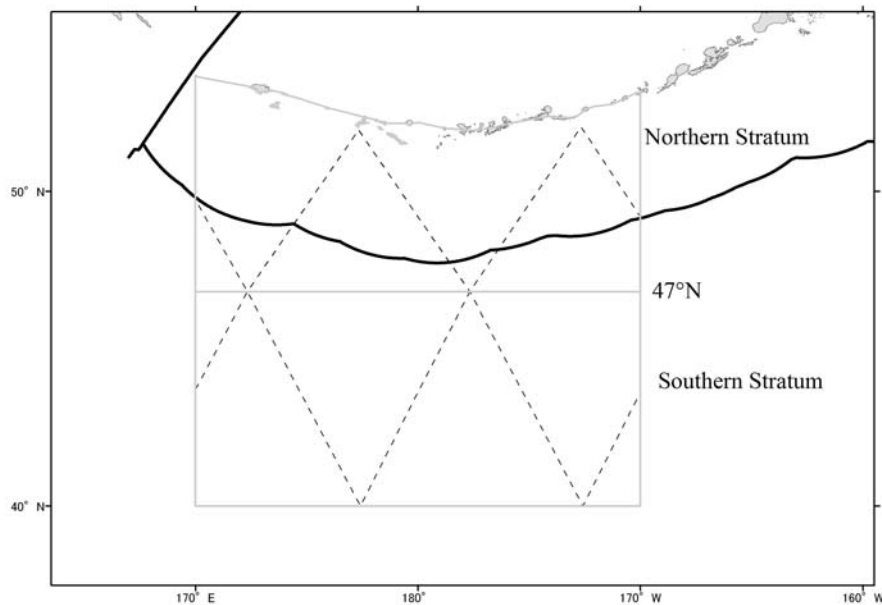


Figure 2. Proposed trackline for the 2010 sighting survey (dotted line). The survey area is divided into northern and southern stratum at 47°N. Black line represents the boundaries for the US EEZs. The starting points of transect lines within the study area were randomized following IWC SC guidelines (Hammond and Donovan, 2004).

Distribution of previous catches of large whales in the proposed research area

To examine the possibility of encounter with large whale species in the proposed survey area the distribution of previous catches in that North Pacific was plotted (Appendix 1). This was done for blue, fin, sei and humpback whales using the catch data recorded in the IWC database (ver. 4.0). There are no minke and right whale catch records in the database for the proposed survey area. From the plotting it can be noted that the research area match the catch distribution for the species examined.

Information collected from this single survey will provide essential information for the intersessional workshop to plan for a medium-long term international programme in the North Pacific.

Cruise track and itinerary

A total cruise of about 60 days (i.e. including transit time) represents the maximum operation period of the vessel without refuelling/resupplying. In order to adequately cover the longitudinal range 170°E to 170°W, it would be necessary to restrict the latitudinal range. Based on past JSV data and catch data, it could be considered that a southern boundary at 40°N and a northern boundary at the Aleutian Islands chain would incorporate the expected latitudinal range of sei whales at that time of the year and allow sufficient coverage.

The cruise will take place in July and August and will involve about 10 day-transit to and from the research area and thus some 50 days of research. Based on experience elsewhere in the North Pacific, allowing for poor conditions and time for photo-identification and biopsy sampling work should enable for an average of about 65n.miles per day to be covered in primary searching effort. Table 1 shows a tentative itinerary for the 2010 cruise.

Table 1. Tentative itinerary for the 2010 North Pacific sighting cruise

| Date | Event |
|-------------|---------------------------------------|
| 2 July 2010 | Vessel depart Kushiro, northern Japan |

| | |
|----------------|--|
| 7 July 2010 | Vessel arrive in the research to the starting point at 43° 55'N; 170° 00'E |
| 26 August 2010 | Vessel complete the research at 49° 45'N; 170° 00'E |
| 31 August 2010 | Vessel arrive in Kushiro, northern Japan |

Research vessel

The actual vessel to be used has not yet been determined but it may be a vessel that has been used in the SOWER programme; it will certainly have suitable characteristics to be able to undertake the plans outlined in this report and it will have space for four researchers. Searching will occur at the most comfortable cruising speed normally between 10.5 and 11.5 knots.

Details of the cruise

Survey modes and length of research days

Activities onboard the ship are classified into two principal groups: on-effort and off-effort. On-effort activities are times when full search effort is being executed and conditions (such as weather and sea conditions) are within acceptable parameters to conduct research. Off-effort activities are all activities that are not on-effort. All sightings recorded while the ship is on-effort are classified as primary sightings. All other sightings are secondary sightings.

On-effort sightings survey research is conducted in one of the survey modes. The two principal modes — Normal-closing Mode (NSC) and the independent observer (IO) Mode — are scheduled for specific legs during the survey of the research area.

Sighting effort is conducted by the bosun and topmen from the barrel (crow's nest) and the upper bridge where the helmsman, captain or officer-on-watch, researchers, and the chief engineer or deputy are also present. Search effort also takes place from the independent observer platform (IOP) in some search effort modes.

Primary search effort is only conducted in acceptable weather conditions. These conditions are used as guidelines; in some circumstances, less severe conditions may still be inappropriate for search effort (see below).

Research hours during the cruise will be the same as on recent SOWER cruises. As in the SOWER programme, for biopsy sampling/photo-identification work on priority species (North Pacific sei, common minke, right, blue, humpback¹, fin, with higher priority to the former two species in this cruise – see items (1) and (2) in page 2-) there may be occasions when it is beneficial to extend research outside the normal research hours. The basis for such special extension of research hours will involve mutual agreement between the captain and cruise leader and an allocation of equivalent time-off the following morning or evening. Details of photo-identification and biopsy works are shown below.

The research day in transits will begin 30 minutes after sunrise and end 30 minutes before sunset, with a maximum of a 12-hour research day. Time-zone changes will be in 30-minute intervals, coming into effect at midnight.

Number of crew on effort

Two crewmembers will be in the barrel (and the IOP barrel when IO mode) whenever full searching effort by binoculars with reticles is conducted.

One crewmember will be at the helm on the upper bridge by binoculars with reticles, regardless of the research mode. Also present on the upper bridge, whenever the sighting survey is conducted, will normally be the captain and chief engineer (or an alternate).

¹ Information should be obtained from the organisers of the SPLASH programme to ascertain whether priority should be given to humpback whales

There will be four researchers on the vessel. During survey, the number of researchers searching from the Upper Bridge should be standardised at three.

Acceptable conditions

The usual guidelines for acceptable conditions will apply, i.e. visibility (to see a minke whale) is greater than 1.5 n.miles and wind speed is <21 knots; the sea state should be <Beaufort 5.

Estimated angle and distance training and experiment

The experiment is designed to calibrate and identify any biases in individual observers' estimation of angle and distance. The experiment should be conducted during weather and sea conditions representative of the conditions encountered during the survey.

The detailed protocol can be found in the Guide for Researchers.

Data format

The survey will be conducted using the same data forms as on the SOWER cruise. Donovan and Matsuoka will ensure that standardised species codes are developed for all species that may be found in the area, basing their work on the existing codes for SOWER cruises

Biopsy sampling

As appropriate and decided by the Cruise Leader, research time will be given for biopsy sampling of North Pacific sei, common minke, right, blue, humpback, and fin whales (Bryde's whales are unlikely to be seen north of 40°N), with higher priority given to the former two species in this cruise (see items (1) and (2) in page 2). Biopsy of killer and sperm whales will be attempted on an opportunistic basis.

Biological sample collection will occur from large vessel surveys using biopsy sampling (skin/blubber collected by projectile dart). Projectile biopsies will be collected using either a crossbow or black powder gun. During any single encounter, no more than five biopsy sampling attempts per individual will be made. It is rare that an animal would be targeted for biopsy more than twice during one encounter, but we conservatively request five sample attempts to allow for occasional low success rates. If signs of harassment such as rapid changes in direction, prolonged diving and other behaviours are observed from an individual or a group, the biopsy activities will be discontinued on that individual or group. The animals to be sampled will either approach the vessel on their own or be approached by the main research vessel during normal survey operations. The projectile biopsy sample will be collected from animals within approximately 5 to 30m of the bow of the vessel.

For large cetaceans, small samples (<1 gram) will be obtained from free-ranging individuals using a biopsy dart with a stainless steel tip measuring approximately 4 cm in length with an external diameter of 9mm and is fitted with a 2.5 cm stop to ensure recoil and prevent deeper penetration (so that only 1.5cm of the tip is available to penetrate the animal). Between sample periods, the biopsy tips are thoroughly cleaned and sterilized with bleach. Biological samples may be collected from adults, juveniles, females with calves and calves. The same size biopsy dart would be used for calves as for adults. No biological samples will be taken from newborn calves. The age of a calf would be determined by the subjective judgment of our field biologists who have up to 20+ years experience in the field. They would, and would be instructed to, be on the side of caution and not biopsy an animal that appeared too young.

Table 2. Expected maximum number of biopsy samples to be collected in the cruise.

| SPECIES | No. |
|-----------------------------------|-----|
| <i>Balaenoptera acutorostrata</i> | 50 |
| <i>Balaenoptera borealis</i> | 50 |
| <i>Balaenoptera edeni</i> | 50 |
| <i>Balaenoptera musculus</i> | 50 |

| | |
|---|------------|
| <i>Balaenoptera physalus</i> | 50 |
| <i>Megaptera novaeangliae</i> | 50 |
| <i>Other species (Physeter macrocephalus, Orcinus orca)</i> | 50 |
| TOTAL | 350 |

Photo-id

As appropriate and decided by the Cruise Leader, research time will be given for photo-identification and /or video taping of right, blue, humpback whales in this cruise. Killer whale is "non-target" cetacean which lower priority on the opportunistic basis. As noted above, the estimated daily number of miles to be steamed in searching mode has a built in allowance for such work.

Photographs will become the sole property of the IWC and are available under the standard IWC Guidelines.

Generally, large whales will be approached within approximately 15-20 m. Photo-identification of adult and juvenile males and females will occur. If the opportunity arises, females accompanied by calves may be approached for photo-identification, but efforts will cease immediately if there is any evidence that the activity may be interfering with pair bonding, nursing, reproduction, feeding or other vital functions.

Videotaping studies

Videotaping of blue whales will occur in accordance with the protocol given in the Guide for Researchers, which also provide further information on biopsy sampling and photo-identification protocols.

Acoustic studies

This will depend on whether it is practical to use a towed array for sperm whales and whether it is possible to obtain suitable sonobuoys for blue whales.

Oceanographic studies

No specific oceanographic studies are planned for 2010.

Use of SCANS equipment

'SCANS' equipment will be used (logistics permitting) to assist in measuring angles and distances and investigating search patterns.

International researchers

An appropriate US scientist would participate in the 2010 survey at no cost.

Identification of home port organiser

It will be the responsibility of the Japanese scientists to organise matters in the home port.

Necessary permits

The Aleutian Islands chain occurs in the planned research area. It should be noted that at least three different kinds of permit or permission would be needed to work in US waters. Research permits (a US MMPA and ESA) are needed for any surveys for cetaceans. Such permits are granted by the US National Marine Fisheries Service.

A second kind of permission needed would be from the US Government (State Department) for entry of a foreign vessel into US waters to carry out research.

Permit from the US Government for research within the EEZ of those islands should be obtained in advance of the cruise (line transect, biopsy and photo-ID experiments). It is noted that should biopsy samples be obtained within US waters, a special CITES permit would need to be obtained; samples obtained outside US waters would need an 'introduction from the sea' CITES permit. CITES permits will also be required to ship the IWC half of the biopsy samples to the SWFSC in La Jolla, as is the case for the SOWER samples.

The Aleutian Islands chain, occurring in the planned research area includes:

Near Islands,
Buldir Island,
Rat Islands,
Andreanof Islands,
Islands of Four Mountains.

Data holders and transportation of equipment

The rules for data availability, shipping and storage will be as for the present SOWER cruise. It also noted that existing IWC equipment used in the 2009/10 SOWER cruise could be used on the North Pacific cruise if required. Copies of data, photographs etc. should be sent to the IWC Secretariat upon completion of the cruise.

Records of all the data taken in US waters be made available for unrestricted scientific research. This includes photographs and one-thirds of the sample from each biopsy sample collected in US waters.

Meetings

Arrangements for the holding of pre- and post cruise meetings with crew and researchers will be the responsibility of the Japanese scientists.

Reports

The cruise will follow the requirements for reports and documentation developed for cruises that could provide data for use under the RMP. This will be the responsibility of the Japanese scientists.

REVIEW OF THE BUDGET

The plans given above assume the same level of Japanese funding being available as for the 2009/2010 SOWER cruise. There are no direct funds available for 2010 within the present IWC budget; the IWC contribution is largely reflected in the contribution of Donovan, Bannister and Brownell to the planning process (IWC, 2009b) and loans of equipment where relevant. Brownell will investigate funding for the US researcher. Funding is thus primarily an internal matter for the Government of Japan.

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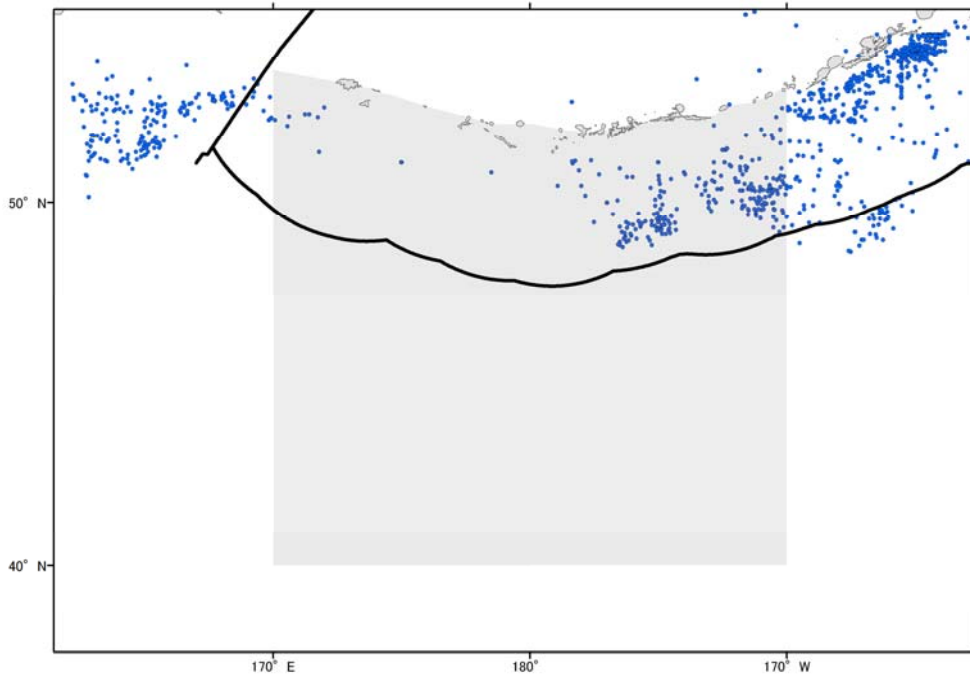
Appendix 1. Distribution of previous catches of large whale species in the North Pacific.

Figure 1. Catch distribution of blue whales in the North Pacific. The proposed area for the 2010 sighting survey is shown in pink. Catch data are from the IWC database (ver. 4.0). Outer limit of US EEZ is provided by NOAA Office of Coast Survey and the data are available from http://www.nauticalcharts.noaa.gov/csdl/docs/GIS_EEZ_Alaska.zip.

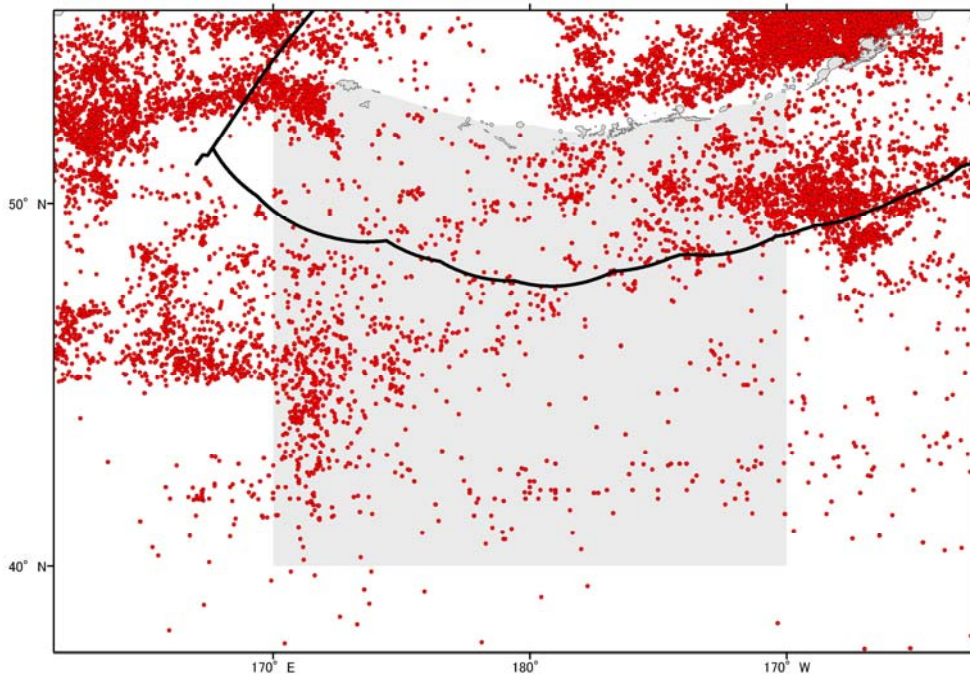


Figure 2. Catch distribution of fin whales in the North Pacific. The proposed area for the 2010 sighting survey is shown in pink. Catch data are from the IWC database (ver. 4.0). Outer limit of US EEZ is provided by NOAA Office of Coast Survey and the data are available from http://www.nauticalcharts.noaa.gov/csdl/docs/GIS_EEZ_Alaska.zip.

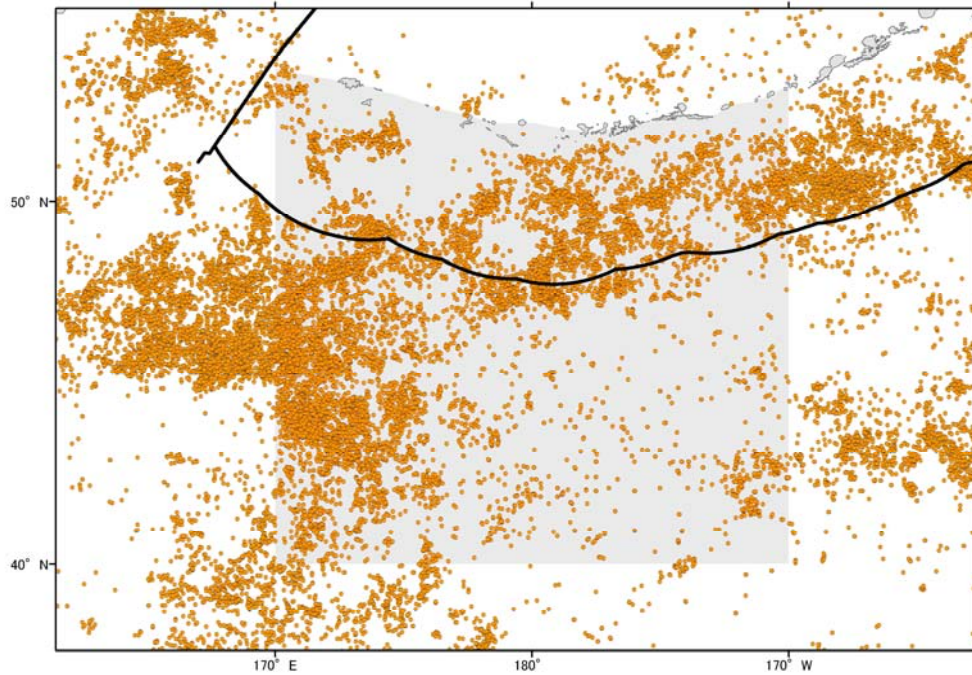


Figure 3. Catch distribution of sei whales in the North Pacific. The proposed area for the 2010 sighting survey is shown in pink. Catch data are from the IWC database (ver. 4.0). Outer limit of US EEZ is provided by NOAA Office of Coast Survey and the data are available from http://www.nauticalcharts.noaa.gov/csdl/docs/GIS_EEZ_Alaska.zip.

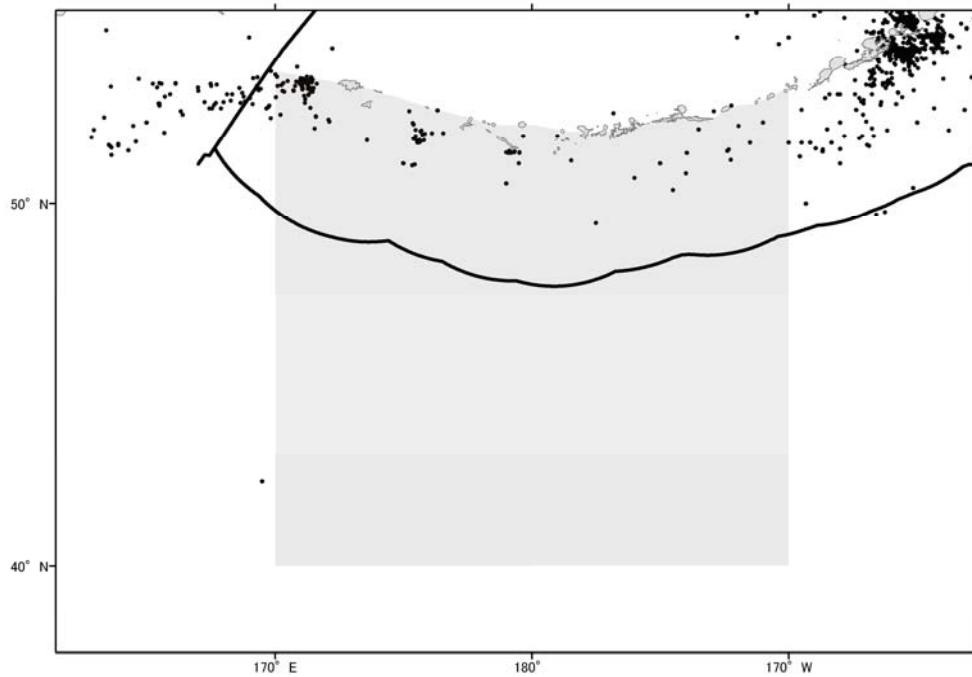


Figure 4. Catch distribution of humpback whales in the North Pacific. The proposed area for the 2010 sighting survey is shown in pink. Catch data are from the IWC database (ver. 4.0). Outer limit of US EEZ is provided by NOAA Office of Coast Survey and the data are available from http://www.nauticalcharts.noaa.gov/csdl/docs/GIS_EEZ_Alaska.zip.