Annex P
Area and Period for the 1999 JARPN Survey

The Government of Japan

1. INTRODUCTION

The research plan for the 1999 JARPN survey was presented at the 50th IWC Scientific Committee meeting (SC/50/O2). In that document the survey area and period were not specified because the 1998 survey had not been completed at that time, and the sampling design for the 1999 survey would depend upon the results obtained from the previous year's survey.

This Annex briefly reviews the research results derived from some analyses conducted using JARPN samples from 1994-1998. On the basis of this review, two survey options (area and period) for the 1999 JARPN survey are determined.

2. SUMMARY OF JARPN SURVEY RESULTS FROM 1994-1998

Results of JARPN surveys from 1994-1998 are presented to the Scientific Committee each year. This year, two documents (SC/51/RMP7, SC/51/RMP8) were submitted to the Scientific Committee. Other studies relating to the JARPN survey are described in SC/51/O6. A brief summary of the studies conducted under JARPN up to 1998 is given below.

2.1 Genetic analyses

Genetic analyses were based on restriction fragment length polymorphism (RFLP), sequencing of the mtDNA control region and microsatellite analyses. The statistical analysis showed no significant geographical differences among sub-areas 7, 8 and 9 in both early and late periods. However, striking differences occur between each of those sub-areas and sub-area 6 (SC/51/RMP8).

2.2 Conception date

The conception date as extrapolated from foetal body length in pregnant females was similar to that of the O stock (i.e. conception occurring in winter) (SC/51/RMP7).

2.3 Parasitic analysis

The results of the analysis of this ecological marker are preliminary. However, it seems that the same parasitic fauna is found in coastal and offshore sub-areas in the eastern waters of Japan. Details of the parasitic fauna analysis will be presented at the JARPN review meeting or at the next Scientific Committee meeting.

2.4 Other studies such as morphometrics and pollutants

Studies relating to morphometrics and pollutants are now underway. Progress on these studies is described in documents SC/51/O6 and SC/51/RMP15. Details of the morphometric and pollutant studies will be presented at the JARPN review meeting or at the next Scientific Committee meeting.

3. SURVEY AREA AND PERIOD FOR THE 1999 JARPN SURVEY

3.1 Rationale for the selection of sub-areas and period

3.1.1 Uncovered sub-area in the 1998 JARPN survey

Sub-area 11 was planned for survey in 1998. However, all the survey activities were concentrated and terminated in the Pacific sub-areas. The sub-area to be selected primarily for the 1999 survey is sub-area 11, which was not covered last year despite the plan to do so.

3.1.2 Necessity of multi-year surveys in sub-areas 7W and 11

These sub-areas have been surveyed in only one season (1996 JARPN). In order to examine the possibility of yearly variation in the stock composition, there is a necessity to conduct surveys in these sub-areas at least one more time.

3.1.3 Survey in the early period in sub-area 7W

Surveys in sub-areas 7E, 8 and 9 had been conducted in early and middle periods. However, sub-area 7W was surveyed only in the late period (late August) and was limited to the northern part of this sub-area.

3.1.4 Unsurveyed sub-areas

Sub-area 12 has not been covered by the JARPN surveys although the need for joint research with the Russian Federation has been raised since the start of the JARPN programme. There is a necessity to survey this sub-area to investigate the segregation by sex and maturity, and the possibility of the occurrence of J stock individuals, and if so, examination of mixing between J and O stocks in this sub-area.

3.2 Proposed area and period for the 1999 JARPN survey

The following two options for the 1999 survey have been adopted. If permission is granted by the Russian Federation, option two will be selected, although the possibility is low.

3.2.1 Option 1:

Survey area:	Sub-area 7W and sub-area 11
Survey periods:	June – August
Samples:	50 individuals (7W)
	50 individuals (11)

The rationale for this option is given in Items 3.1.1, 3.1.2 and 3.1.3 above.

Samples taken in June in 7W would allow comparison with samples taken in August (1996) in the same sub-area. DNA analysis of samples from sub-area 11 suggested a mixing of J and O stocks in April and August. However, no analysis has been carried out for July because of the very small sample size for that month.

3.2.2 Option 2:

Survey area:	Sub-area 7, sub-area 11 and sub-area 12
Survey periods:	June (sub-area 7)
	July (sub-area 11)
	August (sub-area 12)
Samples	25 individuals (7)
	25 individuals (11)
	50 individuals (12)

The rationale for this option is given in Item 3.1.4. Sub-area 12 has not been covered during the JARPN surveys, although it has a high priority in this programme. In this sub-area, the sex ratio and maturity are collected in order to examine the hypotheses that sub-area 12 (Okhotsk Sea) is the main feeding area for mature females of O stock (and W stock?). Furthermore, there is little information on the mixing rate of J and O stocks in sub-area 12 (if any).

3.3 Expected catch of J stock animals

3.3.1 Option 1

Planned catch by month and sub-area and the mixing rate of J stock animals (in parentheses) estimated from allozyme analyses (IWC, 1997b) are as follows:

Sub-area	June	July
7	50 (0.018 in August)	
11		50 (0.076)

The total J stock animals will be 4.7 animals in this option.

3.3.2 Option 2

Planned catch and mixing rate (in parentheses) estimated from allozyme (June sub-area 7, July sub-area 11) conception date and flipper colour pattern (August, sub-area 12) are as follows:

Sub-area	June	July	August
7	25 (0.018 in August)		
11		25 (0.076)	
12			50 (0.015)

The total J stock animals will be 3.1 in this option.

However, the above calculation is based on the mixing ratio of earlier years. For example, the data for sub-area 12 are from the years 1973-1975, before the substantial decline in the J stock indicated by Korean CPUE data. *Implementation Simulation Trials* for North Pacific minke whales take all this information (CPUE, genetics and flipper colour/conception date) into account and predicted a J/O ratio in the Okhotsk Sea that is now much lower than it was in 1973-1975. For example, the NPM1 trial suggests that the J/O ratio is now about 2% in June and 0.5% in July-August in sub-area 12. Therefore, the anticipated catch of J stock whales in August from 50 whales from sub-area 12 is only 0.25 whale. The possibility of damage to the J stock by the planned research in Russian waters is negligible.

4. OUTLINE OF 1999 RESEARCH

4.1 Number of research vessels

One research base ship, three sightings/sampling vessels, and one dedicated sightings vessel will be used.

4.2 Research period

June to August 1999.

4.3 Sightings method

The sightings survey method will be the same as in previous years; one dedicated sightings vessel and three sightings-sampling vessels will be used.

4.4 Sampling method

As in the sampling methods previously employed, all whales sighted are targeted.

4.5 Measurement and sampling items

(1) Research concerning minke whales (see sampling items in the past cruise reports).
(2) Research items concerning the marine ecosystem.

5. LINKAGE WITH RMP IMPLEMENTATION TRIALS AND NECESSITY FOR LETHAL RESEARCH

The JARPN programme has its origin in the development of the RMP trials for North Pacific minke whales at the 1993 meeting of the IWC Scientific Committee. Many alternative stock structure hypotheses were presented at that meeting and it was clear that research was needed to reduce this number for a successful RMP implementation. Therefore, JARPN concentrated on a number of studies aimed at providing stock structure information (see above). The results from the initial JARPN research were used when these RMP trials were revised at the 1996 Scientific Committee Meeting (IWC, 1997b, pp.203-226). The report of that meeting records comments from the senior US scientists that JARPN research had been helpful in this process (IWC, 1997a, p.96).

It is important to note the comments of the Report of the 1996 Working Group on North Pacific Trials as regards differentiating stock hypotheses. The Group acknowledged the utility of genetic, conception date, length and sex distribution data for information on J/O stock mixing. However, for situations such as the O/W stock hypothesis, where there is the possibility of no genetic difference because of low dispersal, the report states:

> The length and sex distribution data were judged to be potentially more useful, in that absence of certain age or sex categories from an area would suggest that animals in that area were not a separated population (IWC, 1997b, p.209).

Thus, the need for such information for North Pacific minke whales, which cannot be acquired by other than lethal methods, is already accepted as important for the North Pacific minke RMP trials. This is particularly so in regard to

the O/W stock hypothesis, where the 1996 meeting noted the lack of samples from sub-area 9 earlier in the season, and also from sub-areas 8 and 12 (IWC, 1997b, p.209) and suggestions were made that this lack prevented acceptance of conclusions that no W stock was present. Since that time, samples have been collected during the JARPN surveys earlier in the season in sub-area 8 and sub-area 9. Again, these results have not provided any conclusive evidence for the putative W stock (IWC, 1998, p.132 and IWC, 1999, p.67).

The major outstanding lack of information in addressing the O/W stock hypothesis issue is the lack of samples in sub-area 12 (the Okhotsk Sea), where limited data on sex, length and some morphological features of 165 animals taken by test whaling in the early 1970s is available. It should also be noted that past Russian catch-at-length data from this sub-area is questionable in reliability (IWC, 1997b, p.207). In addition, it is clear from the results of RMP trials submitted by Allison to this meeting, and also from the final selection of trials (Annex D, table 1), that a major factor influencing trial results is the proportion of W stock in the Okhotsk Sea.

Therefore, information on sex and age composition of minke whales in the Okhotsk Sea (sub-area 12) will be of great importance in assessing the plausibility of the W stock hypothesis, and hence in interpreting the results of the final RMP trials to be presented to the Scientific Committee next year. Therefore, a plan to conduct the lethal scientific sampling necessary to obtain this information should command the highest priority.

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