

WESTERN GRAY WHALE ADVISORY PANEL
5th Meeting

WGWAP-5
3-6 December 2008
Lausanne, Switzerland

REPORT OF THE WESTERN GRAY WHALE ADVISORY PANEL
AT ITS FIFTH MEETING

CONVENED BY THE INTERNATIONAL UNION FOR CONSERVATION OF NATURE

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1. OPENING

The fifth meeting of the Western Gray Whale Advisory Panel (WGWAP-5) was held at Hotel Alpha-Palmiers, Lausanne, Switzerland, from 3-6 December 2008 under the chairmanship of R.R. Reeves.

In addition to the full Panel (see Annex 1), the meeting was attended by representatives of the following organizations (also see Annex 1):

Sakhalin Energy Investment Company Ltd International Union for Conservation of Nature (IUCN) Pacific Environment AEA Technology	Stephen Turner, consultant to IUCN for evaluation of WGWAP
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Finn Larsen of IUCN facilitated meeting preparations and logistics. Julie Griffin of IUCN and Sarah Humphrey served as meeting rapporteurs. Their efforts in support of the Panel’s work are greatly appreciated.

1.1 Introduction and logistics

As reflected in the reports of previous Panel meetings, all of which are available at <http://cms.iucn.org/wgwap/index.cfm>, substantial effort has been invested over the years in the development of advice to Sakhalin Energy, with the overarching goal of assessing the conservation status of western gray whales and minimising the risks to this whale population from human activities on the Sakhalin shelf. Much of that work has been undertaken by a series of task forces, which report to the full Panel. No task force meetings took place during the intersessional period between WGWAP-4 and WGWAP-5. Nevertheless, it was expected that a number of specific tasks identified at WGWAP-4 and at earlier task force meetings would be completed for consideration at WGWAP-5.

In opening the fifth meeting of WGWAP, Reeves expressed the Panel’s disappointment at the lack of progress towards implementation of recommendations from WGWAP-4 and the failure of Sakhalin Energy to provide expected meeting documents in a timely manner, particularly in the context of the constructive interactions that had taken place at previous WGWAP meetings and in the task forces. There is a notable difference in the number of new recommendations in the present report compared to previous WGWAP reports. This should not be interpreted as a sign of progress. Instead, it is a reflection of the fact that the Panel was provided with relatively little new information or analyses that could form the basis of judgements leading to new advice and recommendations.

Further, it was noted that, due to miscommunications between IUCN and various independent stakeholder groups, one of these groups that had sent representatives to previous WGWAP meetings as observers had not been duly invited and informed of the schedule for this meeting. The Panel expressed its regret that this had happened and noted that it is extremely important for IUCN, with support from the Panel and Sakhalin Energy, to maintain fastidiously the communications links with stakeholders in the future. It stressed that the participation of observers has been a key element for ensuring transparency and providing information on western gray whales and their habitat.

1.2 Adoption of agenda

The agenda (Annex 2) had been developed following the pattern of previous WGWAP meetings, *i.e.* it included consideration of the various key topics of concern. However, in

many instances information available to the Panel at this meeting was insufficient to support detailed discussion and deliberation. Prior to the start of the WGWAP meeting, Sakhalin Energy had emphasised that it did not intend to present preliminary reports of fieldwork at autumn or early winter Panel meetings, as it had done at least occasionally in the past. Rather, the company's current position is that the Panel should not have access to results of fieldwork until the scientists involved in the research have completed their analyses. Therefore, at this meeting, Sakhalin Energy provided only verbal summaries of the nature and amount of effort in the various categories of fieldwork. The Panel **stressed** that it expected full reports including results to be made available well in advance of the next WGWAP meeting.

1.3 Documents

As mentioned under item 1.1, much of the information that IUCN and the Panel had expected to be available for this meeting was either not produced at all or was provided only at the last minute. Several of the documents (see later) were delivered and circulated too late for careful review and substantive discussion. The list of documents, including PowerPoint presentations in some instances, is given in Annex 3.

1.4 Report drafting procedures

It was **agreed** that all parties would make every effort to ensure that the final Panel report is publicly available no later than the end of January 2009 and that Sakhalin Energy's formal responses to new Panel recommendations are posted on the IUCN website within two weeks thereafter.

2 REVIEW RECOMMENDATIONS FROM PREVIOUS MEETINGS

The cumulative list of recommendations from previous Western Gray Whale panels and workshops had not yet been posted on the IUCN website at the time of WGWAP-5. However, considerable progress had been made towards organising and reclassifying the status of recommendations in preparation for public release of the list.

In the report of WGWAP-4 (section 2), the Panel had established six categories for designating the status of recommendations. There are 3 'closed' categories and 3 'open' categories, as follows:

- Closed – implemented/resolved satisfactorily. [Note: The wording for this category has been changed from 'implemented satisfactorily' per the WGWAP-4 report.]
- Closed – superseded by a new recommendation.
- Closed – no longer relevant but had not been implemented satisfactorily at the time it became moot.
- Open – no action taken yet.
- Open – in progress.
- Open – in need of clarification/expansion.

Most of the categories are self-explanatory. However, one of them – the third in the above list – requires explanation. Because the full list of recommendations starts with the Independent Scientific Review Panel (the first in an ongoing series of Western Gray Whale panel reports), it spans four years of activity on the Sakhalin Shelf – 2005, 2006, 2007 and 2008. Each season has been characterized by a different array of anthropogenic activities

and as a result, the types of recommendations have varied. Some of them apply to particular activities in particular years and, once those activities (*e.g.* platform construction, pipeline placement) are completed and the year has gone by, the recommendation is either implemented or moot and thus should be closed. In order to signify the difference between outdated recommendations that were implemented to the Panel's satisfaction and those that were only partially implemented or not implemented in a satisfactory manner, the Panel has established the category 'Closed – no longer relevant but had not been implemented satisfactorily at the time it became moot'.

The list is expected to be a valuable tracking tool for all stakeholders. As such, the Panel wished to emphasize four things. First, it is the responsibility of IUCN to manage the list and ensure that all formal recommendations from the Panel as well as all formal responses by Sakhalin Energy are included in it. Second, although other parties including Sakhalin Energy and IUCN are encouraged to provide advice and suggest changes, the designation of current status for each recommendation (*i.e.* closed vs. open etc.) is for the Panel to decide and the final determination rests with the Panel chair. Third, status designations can be changed at any time, *i.e.* the list is meant to be a living document. However, changes must be made according to a set procedure that involves consultation by IUCN with the Panel chair, who will be responsible for ensuring Panel concurrence. Finally, it is the Panel's expectation that those who use the list will do so with respect for the process, bearing in mind the limitations of any such list, including the fact that at a given point in time, many of the recommendations will not fit exactly into only one status category and some status designations may not be entirely up to date. In other words, the list should not be treated as a precisely kept scorecard of performance but rather as a mechanism to ensure that nothing important 'falls through the cracks' and that progress is always being made towards full compliance with the WGWAP Terms of Reference.

3 POPULATION ASSESSMENT

3.1 Progress on update of population assessment

An updated population assessment (WGWAP-5/Inf.2) had been presented to the Rangewide Workshop held in Tokyo in September 2008. The assessment, an update of those previously presented by the Independent Scientific Review Panel (Reeves *et al.* 2005) and to the WGWAP and the International Whaling Commission (IWC) Scientific Committee, used data from the Russia-US research programme, which has been conducting research off Sakhalin every year since 1997 (some additional data from the 1994 and 1995 seasons were also used).

The photo-identification and biopsy data (for sex determination) collected up to and including the 2007 season were used to fit a stage-structured population model. This model provides a profile of the population by sex, age and reproductive status. An advantage of fitting a population model is that it interpolates gaps in the data in a 'natural' way and avoids the assumption that all whales are seen in each year (which is known not to be the case, as individuals can 'reappear' in the photographic record after an absence of several years).

The estimated number of non-calves alive in 2008 was 130 (90% confidence interval 120-142). The estimated average annual mortality rate over the data period is 22% (14-31%) for 'calves' (*i.e.* the mortality from age 6 months to age 18 months) and 2.2% (1.3%-3.3%) for non-calves. There remains an unexplained significant male bias of about 2:1 in the sex ratio of calves ($p < 0.01$).

The above mortality estimates do not include (*i.e.* are additional to) the recent deaths in sets recorded in Japan during 2005-2007 (5 females).

In the absence of additional deaths in fishing gear, and on the assumption that average conditions over the period 1994-2007 continue into the future, the population is projected to continue to increase with high probability (>99%). However, if the rate of such deaths as observed during 2005-2007 continues, there is an appreciable probability (~25%) of population decline, with a 10% risk of population extinction by 2050.

These results suggest that, apart from the deaths in Japan, conditions for the population were somewhat better during 2000-2006 than during the 1990s, as indicated by a reduction in the modal calving interval from 3 years to 2 years. However, the photo-identification data can only provide reliable estimates of reproduction and survival rates in retrospect. If, for example, the exceptionally low number of whales observed in 2008 (see Agenda Item 5) was due to adverse feeding conditions (whether caused by anthropogenic or natural factors), and fewer surviving calves appear on the feeding grounds in 2009 and 2010, a signal of this probably would not be detected in the model fit to photo-identification data before the data up to and including the 2011 season have been analysed.

3.2 Analysis of data on body condition from Russia-US team

An analysis of body condition using data collected during 1994-2005 had been presented to the IWC Scientific Committee in June 2008 (WGWAP-5/Inf.1). Body condition was classified into good, fair and poor, and a trinomial regression model was fitted to the data which allowed for the inclusion of explanatory co-variables, including year, month, class (mother/calf/other) and sex. This enabled year effects, which might reflect variation in feeding conditions, to be separated out from the other, possibly confounding factors.

Lactating females had significantly poorer condition than all other classes, as might be expected. Although there was substantial annual variation, only the year effect for 1999, when body condition was substantially below average, was individually significant. It is planned to publish shortly a full analysis including data up to the 2007 season.

3.3 Data on body condition incorporated into a population assessment

The suggestion to incorporate body condition into the population assessment was a recommendation of WGWAP-4. This item remains on hold until the body condition analysis referred to in item 3.2 is complete.

4 CONCLUSIONS AND RECOMMENDATIONS FROM THE RANGEWIDE WORKSHOP

Donovan summarised the conclusions and recommendations from the IUCN Western Gray Whale Rangewide Workshop held in Tokyo, 21-24 September 2008 (WGWAP-5/5). The emphasis of the workshop was on areas and issues outside Sakhalin and special effort had been made to involve scientists from Japan, Republic of Korea, China and parts of Russia other than Sakhalin Island (notably Kamchatka). The rangewide workshop reflected IUCN's ongoing commitment to address one of the key findings of the Independent Scientific Review Panel in 2005 – that a 'comprehensive strategy' is needed to save western gray whales and their habitat (Reeves *et al.* 2005). Indeed the workshop report is expected to be an important step towards development of a conservation plan for this whale population that considers threats throughout its range. Most of the organisation and planning of the workshop was carried out by Julian Roberts and Finn Larsen of IUCN and

the local facilitator, Tadasu Yamada, of the National Museum of Nature and Science. All of the funding for the workshop came from Sakhalin Energy. It is anticipated that the final workshop report will be submitted to the IWC Scientific Committee in June 2009. In addition, the draft conservation plan will be developed following the guidelines given by Donovan *et al.* (2008; see also WGWAP-5/8), and discussed widely by stakeholders over the coming year and more under the auspices of the IUCN Global Marine Programme; this is complementary to the ongoing work of the Panel.

5 PRELIMINARY RESULTS OF 2008 WESTERN GRAY WHALE DISTRIBUTION AND BEHAVIOUR MONITORING

5.1 Results from Sakhalin Energy/ENL shore and vessel survey program

Sakhalin Energy reported that shore-based monitoring of gray whale behaviour in 2008 began on 1 August and ended on 3 October. Total effort consisted of 55 days (including both behaviour teams, spanning 29 actual calendar days) and 381 hours spent at the six shore-based stations in the northern spit region of north-eastern Sakhalin Island. The first day of data collection was 7 August at 1st Station and the last day was 30 September at 1st/South Stations. There was a total of 326 scans involving 834 gray whales in 643 sightings. Gray whales were tracked for a total of 160 hours (\bar{x} = 83.0 minutes/track), ranging from 3 minutes to 7 hours of continuous monitoring of movement. A total of 116 different tracklines with 8,497 geographic positions were recorded. Focal behaviour observations were conducted for a total of 65 hours on 42 individual gray whales from 7 August to 30 September 2008. The mean duration of a focal session was approximately 93 minutes.

There were nine weeks of shore-based survey effort by the distribution team from 1 August to 1 October. A survey was completed from at least one shore station on 37 days and surveys were conducted at all 13 shore stations on 11 days. The Panel noted that shore-based survey effort, for both the distribution and behaviour teams, began approximately one month later than in the past three years when there was construction activity associated with Sakhalin II Phase 2.

Seven vessel-based distribution surveys were completed in 2008. Three of those were in the Piltun feeding area (4 July, 4 and 26 September), three in the Offshore feeding area (3 July, 2 September and 3 October) and one in the Arkutun-Dagi area (5 September). Three surveys had to be suspended due to fog, including two in the Arkutun-Dagi area (3 September and 4 October) and one in the Piltun feeding area (1 September).

No details were provided on 2008 results but Sakhalin Energy representatives acknowledged that the numbers of gray whales observed in the Piltun feeding area off Sakhalin were notably less than in any previous year since monitoring began. It was noted by the Panel during discussion that during the summer monitoring period, major land-based construction work was underway at an ENL platform site approximately 15-20 km north of the entrance of Piltun Lagoon. The construction area is on shore but adjacent to waters used annually during the summer by gray whales, including mother-calf pairs.

5.2 Results from observational effort by non-industry groups

Tsidulko gave a PowerPoint presentation (WGWAP-5/19) of methods and preliminary results from the Russia-US team's 2008 season. The Piltun lighthouse was used as an observation platform and the scan count protocol was the same as that used since 1997. The team arrived on 2 July and left on 30 August (observations 3 July–29 August). Weather

conditions permitted only 18 days with at least one scan. The longest period of fog (preventing any observations) lasted 17 consecutive days.

There were more gray whale observations in August than in July. The scans from the lighthouse together with the sightings from the inflatable boat used for photo-ID (see Agenda Item 6) gave an impression that fewer whales were in the area and there were fewer daily sightings than in previous years. The distribution of whales was different from previous years when many more whales were observed north of the Piltun lagoon entrance; in 2008 most whales were seen well south of the lagoon entrance. Tsidulko emphasized that the data are preliminary and more analysis is planned.

With regard to industrial activity, Tsidulko reported that seismic work had been expected late in the season, as had ENL on-land construction, but no details were available. In informal discussions with contractors, Tsidulko had learned that a considerable amount of pile-driving activity was ongoing at the northern end of the Piltun spit in June and July. This work apparently was suspended for unknown reasons between about 20 July and early August. Norlen noted that he had heard pile-driving noise when visiting a coastal site south of the presumed ENL construction site in June. Gailey reported that he had not heard such noise from the nearest shore-based whale observing station (ca. 25 km south of the construction site) when he arrived there in early August. Unfortunately, no data on whale observations prior to 3 July were available to the Panel.

Sakhalin Energy advised the Panel that autonomous recorders had been deployed from late June or early July until the beginning of October. Therefore, some relevant acoustic data, which might provide a way of assessing the nature and amount of underwater noise in the Piltun feeding area, should exist. The Panel **recommends** that access to such data be provided in good time before its next meeting in order to help evaluate the possibility of a causal relationship between industrial noise and whale numbers/distribution in 2008.

6 PHOTO-IDENTIFICATION

6.1 Progress report from Photo-ID Task Force

Two research teams have been collecting gray whale photo-identification data off Sakhalin: the Russia-US team, working since 1995; and the Institute of Marine Biology (IBM) team in Vladivostok, working since 2002.

The Photo-ID Task Force was established at WGWAP-2, with the aim of facilitating co-operation between the two teams in terms of joint analyses and, in turn, developing recommendations for future work. This Task Force was composed of scientists from each of the two teams, in addition to interested Panel members, external outside expert(s) (as needed for specific tasks), and nominees from Sakhalin Energy.

The Task Force had agreed to conduct a cross-comparison of the two photo-ID catalogues through the 2005 season and the results were reviewed at a Task Force workshop held in Vancouver in October 2007 (WGWAP-3/Inf.17). Good agreement was found between the two catalogues and the workshop noted that many of the gaps in each team's sighting history for each whale could be filled by data from the other team. Therefore, the two datasets would complement rather than simply duplicate each other.

The 2007 workshop developed a number of recommendations for further work, which were endorsed by the Panel at WGWAP-3. Noting the lack of progress in implementing the recommendations, the Panel proposed (in its report from WGWAP-4) a timetable for

completing the work (WGWAP-4, Annex 4). Progress on each of the tasks, as of WGWAP-5, was as follows:

Task (1): Update of the cross-matching of the catalogues through the 2007 season.

Each team was to send its catalogue through 2007 to Larsen at IUCN, for forwarding to the other team. The teams would then cross-match their respective catalogues to examine additions and review changes made in 2006 and 2007.

Progress: Catalogue update to 2007 received from Russia-US team in August 2008. Still awaiting catalogue update from IBM team.

Task (2): Design and undertake a comparison exercise on a subset of the annual sighting histories.

Progress: A proposal for design and procedure was circulated to the Task Force in August 2008. Based on comments received from Task Force members, a revised proposal and data request was circulated to the Task Force in October 2008. An initial sub-sample of the requested data has been received only from the Russia-US team.

Task (3): Develop protocols for ID-photos from dead animals and whale-watching vessels.

Progress: Weller is working on a protocol.

Task (4): Review the criteria for judging mother-calf pairs, and, if appropriate, develop a scoring system (e.g. as used for southern right whales).

Progress: Awaiting results of Task 2.

Task (5): Review the criteria for identifying unaccompanied calves, and, if appropriate, develop revised criteria for use by each team.

Progress: Awaiting results of Task 2.

Task (6): Compare the criteria used by each team for recording body condition ('skinny whales'), and agree on a coding system that would allow analyses of the combined datasets.

Progress: Awaiting results of in-progress analyses of body condition by Russia-US programme.

Task (7): Draw up specifications for population analyses using the combined data (on annual sighting histories), and seek permission from the relevant parties to enable these to be conducted.

Progress: A proposal for analyses has been circulated to the Task Force for comments.

So far, the Russia-US team has commented that it considers the proposal acceptable. Informal discussions with representatives of ENL indicated support for the joint analysis as a scientific project, but not as a product of work conducted through the WGWAP.

Task (8): Evaluate the potential for analyses using photo-ID and other data that could help measure the effects of anthropogenic disturbance on the whales.

Progress: Awaiting progress on Task 9.

Task (9): Examine the extent of overlap in the research effort in time and space.

Progress: A request for a small sample of effort data was sent to the two teams. Based on data received from the Russia-US team, a template for data tabulation was prepared and sent to the two teams. Data have been received from the Russia-US team. When data from both teams are received, an analysis of the overlap will be performed. It is assumed that the same data could be used for an initial approach to Task 8.

The Panel continues to believe that the work of the Task Force is extremely important to fulfilling the WGWAP Terms of Reference; this is discussed further under Item 6.4.

6.2 Photo-ID of Western Gray Whales in Sakhalin and Kamchatka (IBM team)

Although Sakhalin Energy had advised IUCN and the Panel prior to the meeting that no photo-ID data from the 2008 season would be presented, Bell provided some basic information concerning effort:

There were three elements to the photo-ID work in 2008.

1. Effort focussed on Sakhalin, consistent with previous years (and with a similar number of days).
2. Additional work off Kamchatka, over a three-week period, was funded.
3. The vessel used to survey the Offshore feeding area off Sakhalin was shared with an academic institution and as a result sailed to the Kuril Islands. This enabled additional opportunistic photo-ID work. Bell reported that there had been at least a couple of gray whale sightings.

It was suggested that Vertyankin, who has been collecting the photo-ID data in Kamchatka since 2005 and who attended the IUCN rangewide workshop in Tokyo, be invited to participate in the Photo-ID Task Force (see Item 6.4). Bell clarified that Vertyankin is not a contractor to Sakhalin Energy, but that Sakhalin Energy and ENL jointly fund some of his work and assist with logistics. As a result, Vertyankin has agreed to share his results with Sakhalin Energy and ENL, and would need their agreement to share data with the Task Force or another party.

Photographs of some 40 gray whales killed in the whale hunt off Chukotka were exhibited at the Holarctic Conference in Odessa by Andrei Lutovka. Although these were probably eastern gray whales, it was suggested that it might be worthwhile for the photo-ID teams to see whether they could match any of Lutovka's photographs (while recognising that photographs of dead animals are often not useable for matching).

6.3 Photo-ID of Western Gray Whales in Sakhalin (Russia-US team)

Tsidulko reported on the Russia-US team's photo-ID work in 2008. The methods were essentially the same as employed since 1995. Logistical problems led to the field season being one week shorter than in previous years. The field team in 2008 was, for the first time in the history of the project, 100% Russian, and this necessitated some training and extra effort in capacity building. In general, the work proceeded somewhat less efficiently than in previous years due to the lack of Amanda Bradford's ability to identify individual whales on sight.

Twelve surveys were completed, with 47 hours of direct observation of gray whales. There were 74 encounters with groups of whales, and 44 individuals were identified. Three new calves were added to the catalogue, bringing the total number of individuals identified since 1994 to 172. No new non-calf whales were identified in 2008. One known female that had

not been seen in this area with a calf previously was accompanied by a calf in 2008 and therefore was added to the total of known reproductively active females. Only three of the 26 whales identified as calves from 2004-2007 were re-identified in 2008; based on previous years' experience, 6-10 individual calf re-identifications would have been expected.

Three peer-reviewed papers containing results from previous years' research, using photo-ID data, were published recently (Bradford *et al.* 2008a, b; Weller *et al.* 2008).

The number of whales identified in 2008 was unexpectedly low. The counts from the lighthouse scans were particularly low in July but increased in August. This seemed consistent with the lower number of whales seen in August, when the Sakhalin Energy/ENL shore-based teams started their observations. As discussed under Agenda Item 5, there is concern that the patterns may be the result of anthropogenic disturbances, but definitive conclusions must await further analysis and presentation of the respective datasets.

The Panel emphasised the great importance of the Russia-US photo-ID team's work, which to date has formed the sole basis for the Panel's annual assessments of the demography and status of the western gray whale population.

6.4 Review of the continuation and functioning of the Photo-ID Task Force

Although Sakhalin Energy nominated two members to the Task Force following WGWAP-4, no responses had been received from them during the year and no input from the company or the IBM team had been received by the time of WGWAP-5. The Russia-US team responded to all requests and communications during the intersessional period (between WGWAP-4 and WGWAP-5) but indicated that it would continue to attach priority to the Task Force only if a clear sign of reciprocal interest is received from Sakhalin Energy or the IBM team. Bell explained that there were a number of reasons for the lack of responsiveness on the part of Sakhalin Energy and the IBM team, including staffing issues and extensive focus on commissioning activities.

After discussion of the situation and expressions of considerable disappointment over the lack of progress, the Panel and Sakhalin Energy **agreed** that the list of tasks agreed at WGWAP-4 (Annex 4 of WGWAP-4 report) should stand, but that a revised timetable would be drawn up. Bell committed to provide a revised timetable after consulting with Tyurneva and others, before the WGWAP-5 report is finalised.

After the meeting, and following consultation with both photo-ID teams, the Panel and Sakhalin Energy **agreed** on the revised timetable given in Annex 4. Provided that Tasks (1) and (2) are completed on time, it was **agreed** that the Task Force would try to meet for a day or more immediately prior to WGWAP-6, with at least one member of each photo-ID team present. The Panel **reiterates** the great importance it attaches to the work of this Task Force. It sees the timely co-operation of Sakhalin Energy in this work as symbolic of Sakhalin Energy's commitment or otherwise to the Panel process. Without effective participation from Sakhalin Energy, the Task Force will fail.

6.5 Review of progress on comparison of Kamchatka photos to both the Russian and the Russia-US catalogues

There was no progress on this item since WGWAP-4.

7 MMO PROGRAMME AND CARCASS DETECTION

7.1 2008 MMO programme preliminary report

Although no preliminary report of the 2008 MMO programme was available, Bell provided some general information. Twelve individuals were deployed in the field, and all had been involved in the programme in previous years. Most of the MMO activity was on crew change vessels, three of which were active making approximately 500 trips in 2008 (to the PA-A, PA-B and Lunskoye platforms). In addition, one vessel engaged in monitoring and sampling sediment around the offshore pipeline carried MMOs on two trips. Total MMO effort averaged approximately 460 hours per month, totalling approximately 2800 hours for the entire season. Eight gray whales were reported in six sightings on four days. Approximately 4,000 other marine mammals, more than 85% of them pinnipeds, were sighted throughout the season.

Sakhalin Energy provided document WGWAP-5/6 in response to the Panel's previous request for clear explanations for inshore movements by the crew change vessel *Miss Sybil* on 6 and 21 September, 1 and 13 October and 2, 3 and 5 November 2007 (recommendation WGWAP 4/001). The Panel was satisfied with the company's response and considers that the recommendation has been implemented and is closed, on the understanding (per recommendation WGWAP 4/002) that Sakhalin Energy will continue to document vessel deviations from the navigation corridors towards whale feeding areas and make this information available in its annual MMO reports.

7.2 Update concerning annual revision of the Marine Mammal Protection Plan

Sakhalin Energy advised the Panel that the company's Marine Mammal Protection Plan (MMPP) is updated annually. Discussion concerning how this plan had changed since the late spring or early summer of 2007, when Sakhalin Energy was preparing for its final 'construction' season for Sakhalin II Phase 2, was hampered by the fact that the updated (2008) MMPP had not been available for Panel review prior to this meeting.

In his verbal summary of changes since 2007, Bell noted that aspects specific to particular offshore activities in earlier years had been expunged from the plan, which now focuses on the operational phase rather than the construction phase. He indicated that the only major change to the MMPP since 2007 was in relation to the speed limit for crew change vessels (see WGWAP-4 report, section 5.1), which has been increased from 17 to 21 knots, applicable only in established traffic corridors and under good weather conditions. As noted in the WGWAP-4 report, the Panel considers that, on the basis of the limited evidence available, a precautionary approach to vessel speed management is to ensure that speeds of large vessels do not exceed 10 knots when travelling in areas where there is a substantial probability of encountering whales.

The Panel drew the attention of both Sakhalin Energy and IUCN to recommendation WGWAP 2/006, which has been classified as 'closed' but only because it is supposed to be a routine part of the annual work plan: "The Panel recommends that as a matter of routine, IUCN and Sakhalin Energy ensure that the Panel is provided with relevant updated MMPP documents for review well in advance of each field season." One element of the MMPP that requires further attention from both the Panel and Sakhalin Energy is the field data form(s) to be filled out and filed whenever a cetacean carcass is examined by a Sakhalin Energy employee or contractor.

In response to questions from the Panel, Bell stated that offshore activities in 2008 consisted only of installation and removal of flotels at the PA-B platform and some repair

work on a diving platform. There was no pipe-laying and no large construction vessels were deployed. Decommissioning of the Single Anchor Leg Mooring (SALM) facility and Floating Storage and Offloading tanker at the Molikpaq (PA-A) platform had proceeded as planned (see WGWAP-4 report) and the SALM has been laid on the seabed as a security backup for the next five years. Oil from the Sakhalin II project is now being transported entirely through the pipeline.

7.3 Update on Sakhalin Energy authorization to collect tissue samples

Sakhalin Energy reported that verbal authorization had been obtained from Russian authorities and therefore that the collection of a small tissue sample from any stranded gray whale or other whale not immediately identifiable to species would be incorporated into company procedures. Therefore, recommendation WGWAP 4/004 has been implemented and is closed.

7.4 Update on necropsy manual

In response to the Panel's recommendation (WGWAP 4/003) that relevant portions of a necropsy manual be translated into Russian and made available to relevant groups and individuals along the Sakhalin coast, Sakhalin Energy reported that the translation had been completed and that the document in Russian was now available on the Sakhalin Energy 'livelink', which ensures its availability to Sakhalin Energy personnel. Larsen indicated that IUCN would also post the document on its WGWAP website. After some discussion about how the manual might be made more generally available, it was **agreed** that IUCN should take the lead, in consultation with Panel members and Sakhalin Energy, in developing and pursuing a distribution strategy which should include local and regional government agencies, scientific institutions and NGOs.

7.5 Update on necropsy kit

In response to the Panel's previous recommendation that Sakhalin Energy obtain three necropsy kits and ensure their availability at strategic points on Sakhalin Island (WGWAP 4/005), Sakhalin Energy had requested more information from the WGWAP on the contents and costs of such kits and on the methods for preserving any tissue samples obtained so that they can be compared to the Russia-US team's genetic profiles. Reeves reported that there had been intersessional correspondence with relevant experts and that the requested information would be collated and transmitted to Sakhalin Energy before the 2009 field season. Sakhalin Energy confirmed that it will use this advice to assemble three basic kits and deploy them as recommended for the 2009 field season (and beyond).

8 MULTIVARIATE ANALYSIS (MVA)

8.1 MVA of 2006 data

In principle, the scientific purpose of the multivariate analysis (MVA) is to determine the effects of anthropogenic noise on the behaviour and distribution of whales. The effects of noise from activities of the sponsoring companies (Sakhalin Energy and ENL) is the matter of primary interest, but in order to interpret the data it is necessary to take noise from all sources into account.

Gailey described the analysis of the 2006 data that is in progress. The approach of previous years has been adapted based on a review of Panel recommendations. Most current Panel recommendations have been incorporated but some past recommendations were delegated

to the proposed MVA workshop, as these involve larger issues that will require a new analytical framework or extensive analytical/processing effort. The final report is not expected to be ready before May 2009, but Gailey indicated that summaries of data and results could be made available for a WGWAP meeting in April 2009. With respect to the Panel's recommendation for input ('proactive collaboration') by one or more independent statisticians (WGWAP 4/007), Gailey received the advice that after initial discussions about the analyses to be undertaken, it would be better for an independent statistician to review the work after it was conducted rather than provide continuous input to work in progress. Donovan confirmed that that was the intention of the Panel's original recommendation.

Racca presented WGWAP-5/20 and explained how noise from near-shore vessels and offshore activities had been distinguished for the purposes of the MVA. Information was used from vessels known to be present, incorporating GPS tracks where available. Because vessel noise dominates over relatively short ranges, it was modelled as a simple power-law decay with distance from the vessel. Source levels for each vessel were estimated from received noise levels using an *ad hoc* approach. The full acoustic model was used to model the noise from the offshore industrial activities.

The predicted total noise level in the frequency range 20 Hz -15 kHz from vessels and from offshore activities was calculated using the above models for each sound recording location at 1-minute intervals. Sound levels at 1-minute resolution were provided by POI for each of its recorders, although each recorder is 'deaf' for a few minutes each hour for data writing. The discrepancy between observed and modelled levels at the active recorder location closest to a whale observation point was computed for use as a correction factor for that location. A predicted noise level was then computed at 10 m depth at the location of each whale observation by the application of the correction factor to the modelled estimate at that position. Testing the accuracy of this procedure would be straightforward (*e.g.* by using the location of a AUAR as the position of a 'test' whale and then using data from the modelling and other AUARs to generate estimates of levels at the test position). Such testing would provide data on the performance of the noise prediction method in a variety of scenarios, including different distances between the whale's location and the locations of reference hydrophones. Indeed, exactly such an approach was recommended by the independent reviewer of the 2005 MVA (see WGWAP 1/Inf.2) and that recommendation was incorporated in the final report of the 2005 MVA (WGWAP 2/Inf.7, Appendix A). At this stage, the accuracy of the noise predictions from the enhanced estimation approach for the 2006 MVA has not been tested. However, according to Racca, a similar validation procedure is planned for the 2006 MVA.

Vedenev queried how the coordinates of vessels or vessel 'spreads' (*i.e.* groups of vessels working in close proximity) were handled in order to ensure that they were representative of actual operations. Gailey acknowledged that the data on vessel locations were incomplete; at times, observational data showed vessels to be present but no corresponding GPS data were available. He was unsure how such cases might be handled in the analysis. Racca emphasised that there could have been 30 or more vessels in the operating area, and instantaneous GPS coordinates for all of them were not available at all times. In many instances it was possible to obtain positions only for certain, usually large, vessels. Long-term satellite tracking of some of the construction vessels was performed in 2006 through a subscription-based transponder logging service and this can be observed and retrieved online by Sakhalin Energy, but the interval between positional updates is in most cases too wide to provide reasonable accuracy. Racca reported that he and his team had looked at the available MMO data, which include GPS positions recorded every 30 minutes, to validate model scenarios.

Vedenev reported that during his team's acoustic monitoring in 2006, coordinates of the main construction vessels had been obtained from the VHF safety system 'Seatex AIS 100'. This is an Automatic Identification System (AIS) for online exchange of coordinates by VHF channel for vessels within 20 km of each other. It allows coordinates to be tracked by the minute. Vedenev suggested that such a VHF/AIS recording system should be used in any future attempt to collect data on vessel positions in support of multivariate analyses such as those being attempted by Racca, Gailey and colleagues. Vedenev further pointed out that the 2006 data from his team, including stations far from a POI recorder, were available and that their incorporation into Racca's model would likely improve its performance. Racca indicated that he would be interested in merging these data into the overall model but that such data merging requires considerable time, particularly when the data come from heterogeneous sources.

Nowacek pointed out that whales tend to respond more strongly to transient noises (*e.g.* a ship changing gear or accelerating) rather than sustained noise (*e.g.* continuous, slowly varying noise) and that transient sounds would tend to be lost in data averaged over a 1-minute resolution. Racca agreed that the loss of transient noise was a valid concern. However, he stressed that POI currently provides JASCO only with 1-minute averaged data rather than unprocessed ('raw') data, and any changes to this standard arrangement would need to be stipulated and involve reprocessing of the data from POI. It was suggested that instead of reprocessing all of the acoustic data, it might be more efficient to search the behavioural data for any evidence of 'startle' reactions by the whales, and then see if such reactions could be linked (spatially and temporally) to acoustic transients.

The Panel acknowledged that the efforts by Gailey, Racca and others in pursuing the MVA represented progress. However, partly in view of the limited capacity of the analysts to implement new suggestions at this stage, the Panel chose not to offer any further recommendations with respect to the 2006 MVA. As expressed in its previous reports, the Panel's main concerns relate to the power of the approach to distinguish between scenarios with no impact and scenarios with substantial impact. This is a difficult and more general issue that should be addressed at the proposed MVA workshop (see Agenda Item 8.3).

8.2 Final adoption of data availability protocol

The data availability protocol as presented in WGWAP-5/11 report was agreed unanimously by the Panel and Sakhalin Energy representatives, and therefore it is adopted. The protocol provides a means to share data while ensuring that the rights of data owners are protected. The sole outstanding issue is what kinds of sanctions might be appropriate and feasible in the event of a violation. It was agreed that this issue would be deferred and dealt with in an appropriate *ad hoc* manner (should such an unfortunate circumstance ever occur).

8.3 Update on progress with MVA workshop(s)

Donovan had attended the Joint Industry Program (JIP) meeting in Houston and talked with Gentry, Young (JIP Chair) and Melton (ENL) who expressed support in principle for the MVA workshop concept, which is relevant to more than just western gray whales. The idea is that a full proposal (including funding requirements) should be developed under the auspices of an academic group such as that at St Andrews University, Scotland. Donovan will follow up with St Andrews to see if they are willing to develop a proposal along the lines discussed at WGWAP-4, with western gray whales forming one of a number of case studies. It is hoped that the St Andrews group will take responsibility for the proposal and

the workshop(s). The Panel stresses again that such a workshop (or workshops) would have great value to its own work.

9 MONITORING AND MANAGEMENT OF CONTINUOUS NOISE

9.1 Further consideration of results from Sakhalin Energy's 2007 noise and whale monitoring programme

It had been anticipated that the discussion of this topic at WGWAP-4 would continue at WGWAP-5. However, the complete 2007 data, incorporated in a 203-page technical document called 'Acoustic & Hydrographic Studies on the North East Sakhalin Shelf 3 July to 15 September, 2007' from POI ('POI 2007 Noise Close-out'), were not available to the Panel until the start of WGWAP-5. This apparently was due to a breakdown in communications between Sakhalin Energy and IUCN.

Muir clarified that there had been some confusion prior to WGWAP-4 but that data had been given to the Panel during that meeting. Her understanding from Nowacek during the WGWAP-4 meeting was that the Panel's particular request for data on underwater noise and whale distribution during the 'noisy' period of June-July 2007 had been addressed in a satisfactory manner.

Although there was no formal discussion of the 2007 close-out report at WGWAP-5, given the lack of time for a proper evaluation, Nowacek provided some brief comments on aspects of the report based on his initial quick reading, in order to flag some issues for future discussion. These are summarised below.

- There is reference in the document to a DVD containing plots of acoustic data from all of the recorders, but the Panel had still not received this item. Bell stated that Sakhalin Energy receives such a disk each year from POI and distributes it to JASCO and others. He **gave assurances** that he would provide copies of the disk to Nowacek and Vedenev as quickly as possible.
- Several stations normally occupied by recorders had not been provided with recorders in 2007.
- Seismic signals had been recorded on some bottom-mounted buoys, specifically those at Arkutun-Dagi, OFA and Lunskeye stations. As noted in section 10.1.1 of the WGWAP-3 report, several Panel members had observed a seismic survey underway south of the Piltun feeding area during a site visit to Sakhalin in August 2007. The data indicative of seismic noise need to be considered in any analysis of whale distribution, behaviour and movement in summer 2007. However, Nowacek pointed out that the signals overloaded some of the acoustic recorders (effectively causing a loss of the data) so it remained unclear how this information might be used in an MVA.
- There was reference in the document to 2007 onshore seismic signal generation and related experiments. Evidently, these were transmission loss experiments conducted on behalf of ENL but it was not clear whether they were intended to help interpret the transmission of noise from pile-driving at Odoptu (the ENL platform site; see Item 5, above).
- Data specifically requested by the Panel at WGWAP-4 from buoys located on the 10 m isobath were not provided even though these data are critical for a final evaluation of noise levels in 2007.

9.2 Documenting the evolution of Sakhalin Energy's noise management and mitigation programme – lessons learned

No significant progress had been made by the Panel on this project since WGWAP-4.

9.3 Review results of comparison of methodological approaches and observational data from the two shore-based teams

Document WGWAP-5/18 was prepared and presented by Gailey in response to recommendation WGWAP 4/008 requesting a comparison of scan and count methods and of the analytical approaches used to calculate distance using data from the two shore-based teams (herein called distribution team and behaviour team). A number of analyses were conducted to examine potential differences in distance estimation and whale counts (on both a daily and single scan basis). In general, scan protocols were similar although there were some seemingly minor deviations in scan rate, scan direction and overall scan duration. Environmental and sighting information recorded by the two teams was also similar except for the following variables, which were recorded by one or the other of the teams but not by both: (1) precipitation, (2) horizon visible, (3) swell height, (4) atmospheric temperature, (5) atmospheric pressure and (6) observer who initially sighted a whale or whales (for details see Appendix 1 of WGWAP-5/18).

Gailey reported that the lack of a standard definition of 'visibility' was likely to be the most problematic issue when attempting to combine the two datasets for analyses (*e.g.* the MVA presently being conducted by Gailey *et al.*). Both teams use a distance approximation equation to estimate the distance and geographic location of whales from binocular reticle readings (see Lerczak and Hobbs 1998). This line-of-sight estimation technique does not, however, account for possible bending due to environmental conditions that cause refraction. Consequently, the distance approximation by both teams also includes a refraction correction (Leaper and Gordon 2001) that considers both atmospheric temperature and pressure at the time of the observation. To date, only the behaviour team has recorded atmospheric temperature and pressure at the time of each scan survey. Temperature and pressure were assumed to be standard values of 20°C and 1000 pascals respectively for the distribution surveys for the purpose of calculating the refraction correction for sightings made by the distribution team during 2004 to 2008. Sakhalin Energy reported that the survey protocol for the distribution team will be modified in 2009 to record temperature and pressure for each survey conducted.

To evaluate the accuracy of the two approaches to distance estimation, vessel positions as estimated and calculated during scans in 2006 using (a) just the Lerczak and Hobbs (1998) correction and (b) additionally applying the Leaper and Gordon (2001) refraction correction, were compared to the actual locations recorded by the shipboard Global Positioning System (GPS). Both distance calculations tended to underestimate (in numerous cases quite substantially) the actual distance of the vessel (for details see Table 1 of WGWAP-5/18). That being said, the refraction correction did compensate for at least part of the underestimation, thereby improving overall accuracy. Estimated swell height, another important variable to incorporate in estimation of sighting distance, is also lacking from the distribution team's data, and this raises an additional issue for analyses using the combined datasets.

WGWAP-5/18 also showed that there was considerable variability between the two teams in the number of whales counted during a scan as well as a fundamental difference in how a pod was defined. Gailey presented summary information showing that scan counts of the two teams matched exactly only 35% of the time (for details see Table 2 of WGWAP-5/18).

In other words, 65% of the overlapping scan counts compared by Gailey differed by at least one whale; 13% of the scan counts differed by ≥ 4 whales. That said, the majority of the discrepancies were ≤ 2 whales. In the data examined for both 2006 and 2007, whale counts did not differ significantly between the teams ($t = -1.429$, $P = 0.163$) although the sample sizes precluded proper analytical testing. Gailey attributed the differences in counts between the two teams primarily to how a pod was defined. For example, the distribution team was more likely to ‘split’ sightings of multiple whales with minor differences in bearing, reporting them as multiple pods, whereas the behaviour team was more likely to ‘lump’ such sightings and report them as one pod with a single bearing and group size. Gailey offered to examine the matter more closely but indicated that he would not expect there to be major differences in total counts between the two teams. It remained uncertain how differences between the two datasets would be accounted for in combined analyses (e.g. density estimation).

Regarding the implications of Gailey’s findings for mitigation planning for the 2009 seismic survey, Muir noted that the bias in distance estimates increased with distance. She acknowledged that the analyses in WGWAP-5/18 were a valuable contribution towards standardizing behaviour and distribution scan survey protocols and subsequent calculation of whale sighting locations, and would enhance her efforts using the combined datasets to plot whale density and distribution. Bell pointed out that although the insights provided by WGWAP-5/18 were valuable and would allow some improvements to be made in the analyses, an experimental approach specifically designed to examine differences between the two teams would have been preferable.

The Panel welcomed this analysis and thanked Gailey for his work. It emphasised that the analyses in WGWAP-5/18 had demonstrated the importance of standardising data-collection protocols between the two teams, especially with regard to environmental and sightings data. Such standardisation is essential if integrated analyses combining datasets from both teams are to be conducted now and in the future. Despite their preliminary nature, the results highlighted a number of concerns: distance was underestimated by both of the shore-based teams and there was substantial inconsistency in the number of whales counted during overlapping scans. Both issues are directly related to analyses that attempt to combine the datasets (e.g. MVA, density estimation) and there is particular urgency to address them in the context of design and mitigation planning for the 2009 seismic survey (see Agenda Item 12).

9.4 Progress on development and testing of digital real-time monitoring buoys

In a verbal summary, Racca reported that Sakhalin Energy was emphasising quality control and moving rapidly towards digital radio telemetry to replace its current use of analogue transmitters. Both commercial radio modems and the latest digital technology coordinated by POI are being investigated. According to Racca, the POI system can achieve a ≥ 25 km range at a >4 kHz sampling frequency (i.e., provide an acoustic bandwidth up to 2 kHz) with less power consumption than the commercial system, and therefore it is the currently preferred option. The POI system was deployed at Piltun in July 2008 for testing and optimisation, and results were satisfactory. The relevant Panel recommendation (WGWAP-4/012) is that the buoys be capable of transmitting acoustic data at ≥ 16 bits or with ~ 72 dB dynamic range, but this specification was not discussed. Also, based on *in situ* recordings reported by Madsen *et al.* (2006), seismic air guns generate measurable energy up to 3 kHz, but the real-time buoys, as currently configured, would not be able to sample the energy between 2-3 kHz.

For legal and administrative reasons, the technology used in Sakhalin needs to be developed locally (*i.e.* within Russia). Therefore, representatives of JASCO's System Division are visiting the POI testing base to ensure that the required levels of quality control can be integrated with the POI system. They are working on an accelerated schedule for full deployment meant to guarantee a continuous stream of quality data in the 2009 field season. Vedenev is familiar with the POI system and remains sceptical that the ≥ 25 km range can be achieved. This range is a critical issue as the digital radio buoys will be the primary means of monitoring the levels of noise entering the whale feeding area during the 2009 seismic survey. Therefore, this topic **must be considered** by the Seismic Survey Task Force at its meeting in early 2009 (see section 12.3).

10 BENTHIC MONITORING

10.1 Preliminary 2008 benthic monitoring report

Sakhalin Energy had advised IUCN and the Panel prior to the meeting that no data from the 2008 season would be presented.

10.2 Report from Environmental Monitoring Task Force

The Environmental Monitoring Task Force (EMTF) was established at WGWAP-4 (see WGWAP-4 report, Annex 6, for the EMTF draft Terms of Reference). At that time, Dicks, Tsidulko, VanBlaricom (Chair) and Weller were identified as Panel members of the Task Force. At the present meeting, Bell identified Broker, Efrimov and Fadeev as Task Force members from the Sakhalin Energy side.

At WGWAP-4, there had been agreement in principle between the Panel and Sakhalin Energy to organize a site visit to the Sakhalin II project area during September 2008. Principal goals of the proposed site visit were:

- 1) Observations of the foraging habitat of western gray whales, particularly diving observations by some EMTF members in the Piltun feeding area;
- 2) Observations of other key habitat components in the area of the foraging habitats of western gray whales, including Piltun and Chayvo Lagoons; and
- 3) Discussions with Sakhalin Energy's environmental monitoring personnel regarding management, analyses, syntheses and presentations of data on gray whale prey and feeding habitat characteristics.

In addition to the environmental monitoring objectives of the visit, there was a fourth objective (to be led by Dicks) related to previous WGWAP oil spill response recommendations, namely:

- 4) A follow-up visit to existing and proposed storage locations for oil spill prevention/response equipment and proposed locations of waste disposal sites (see Agenda Item 13.2).

Prior to September 2008, it had become apparent that competing obligations and priorities would prevent Sakhalin Energy from being able to host the proposed EMTF site visit. Therefore, at Bell's request, as communicated to Larsen, Reeves and VanBlaricom during a conference call in August, it was agreed to postpone the site visit to summer 2009.

At WGWAP-5, it was discussed and **agreed** in principle that the EMTF site visit would take place in late July or August 2009, with specific objectives the same as those indicated

above. The new timeline for EMTF activity related to the site visit will include preliminary reports at WGWAP-7, with the final reports of the EMTF and the OSR evaluation to be submitted electronically to the Panel during the intersessional period between WGWAP-7 and WGWAP-8. This timeline reflects the assumption that WGWAP meetings will continue to be semi-annual, occurring in spring and autumn. The possibility of a workshop of the Task Force some time in 2009 was not ruled out, but planning for such a workshop, should it be deemed necessary, was judged premature.

There is an immediate need to identify and obtain background technical documents on environmental attributes of the Sakhalin II Project Area, as specified in the EMTF draft Terms of Reference. Although the relevant Sakhalin Energy documents are in hand, no effort has yet been made to obtain documents from other sources, including documents produced prior to the initiation of oil and gas activities on the north-eastern Sakhalin shelf and materials published in languages other than English or Russian. It was suggested that the Task Force might wish to co-opt a specialist in geospatial ecology, statistical analyses and Geographic Information Systems to participate in its work. The Panel and Sakhalin Energy **agreed** in principle and VanBlaricom was asked to explore the options in consultation with Larsen and Bell.

11 SATELLITE TAGGING

11.1 Progress on recommendation on western gray whale satellite tagging

As part of the Panel's ongoing dialogue regarding satellite tagging of western gray whales, Donovan presented an overview of this topic as discussed at the rangewide workshop in Tokyo in September 2008. Participants in the workshop agreed that a good spatial and temporal understanding of the migratory routes, breeding areas and movements of western gray whales is essential if effective conservation measures are to be developed and implemented to protect the whales from anthropogenic threats throughout their range, particularly entanglement and entrapment in fishing gear, vessel traffic and industrial activities. At present, there is a severe shortage of such information. The workshop therefore stressed that the most efficient (and probably only) way to obtain the necessary data is through a carefully planned satellite-tagging programme. A successful tagging programme would provide insights on threats (*e.g.* what they are, their spatio-temporal character and severity), reveal new information about the biology and behaviour of the animals to allow the development of effective mitigation measures, and better inform research and conservation planning.

The Tokyo workshop endorsed the previous recommendations by the IWC Scientific Committee and the various IUCN panels that a satellite-tagging programme, designed to ensure that necessary safeguards are in place to minimise risks to the health of individual animals and to the population's recovery, be undertaken as soon as possible. It stressed that initiation of the programme should not be further delayed and recommended that every effort be made to attempt tagging towards the end of the 2009 field season. To that end, the Panel reaffirmed its support and encouraged the co-ordination group (established at the 2007 IWC Scientific Committee meeting) to begin its work via e-mail, well in advance of the 2009 IWC meeting.

To update the Panel on recent advances in tagging technology, Weller gave a presentation (WGWAP-5/10) describing a 'barnacle tag' developed by Russ Andrews of the University of Alaska Fairbanks. This instrument consists of an external tag package attached with two 6.5 cm x 4 mm diameter implantable titanium barbed posts. The transmitter is a Wildlife

Computers SPOT5, and the overall external package is 6.8 cm long, 3.4 cm wide and 2 cm tall and weighs approximately 49 grams.

Although the barnacle tag was designed initially for use on killer whale dorsal fins, a number of researchers have attached such tags to other cetacean species, including several mysticetes, with relatively good outcomes. Of particular relevance to the present situation is the news that a barnacle tag attached to an eastern gray whale off Alaska in May 2008 has transmitted positional data for 85 days, including a substantial number of days while the whale was presumably feeding off the coast of Chukotka, Russia (John Durban, pers. comm. to Weller).

12 4-D SEISMIC SURVEY

12.1 Review status of western gray whale mitigation and monitoring

In the absence of new documents on this item, Bell gave a verbal report on behalf of Sakhalin Energy.

Sakhalin Energy has selected a contractor – DMNG (Dalmorneftegeophysica, Yuzhno-Sakhalinsk, Russia) – to carry out the seismic acquisition. DMNG has the required permits to conduct this kind of seismic acquisition work off Sakhalin. Consequently, Sakhalin Energy believes that no formal Environmental Impact Assessment (EIA) for the planned 2009 survey needs to be submitted to the Russian authorities. However, an EIA is being prepared anyway and will be made available shortly. Bell stated that all Task Force recommendations had been included in the EIA, and that Sakhalin Energy was moving ahead on the understanding that all of these recommendations would be implemented during the seismic acquisition. The relevant monitoring and mitigation requirements from the Task Force are included in the contract with DMNG.

Hancox noted that from the lenders' perspective, an EIA is required (as per World Bank and International Finance Corporation guidelines). The lenders have been operating under the assumption that the Panel would review the EIA. If this is not the case, then AEA (the lenders' independent environmental advisor) may itself need to review the EIA for the lenders and therefore would need to be provided with a copy in a timely fashion. While acknowledging that the legal requirement may no longer apply, it is important that Sakhalin Energy demonstrates compliance to the lenders.

The Panel noted that the issue of whether the lenders require an EIA is beyond its competence and needs to be settled between Sakhalin Energy and the lenders directly.

12.2 Update on implementation of recommendations

In its March 2008 report (WGWAP 4/Inf. 15) the Seismic Survey Task Force had made a number of recommendations, all of which were endorsed at WGWAP-4. The specific recommendations for real-time monitoring and mitigation during the survey were reproduced in Annex 7 of the WGWAP-4 report and Bell indicated that all of these would be included in the EIA.

The situation regarding other recommendations of the Task Force is as follows:

The Task Force had discussed the possibility of obtaining useable data with low sound energies, *inter alia* by having more recording streamers to improve the signal-to-noise ratio. Sakhalin Energy had indicated that the sound energy could not be reduced because such reduction might jeopardise comparability with earlier surveys. Noting this, but with a view

to the possibility that future surveys could be conducted at lower energies, the Task Force had recommended that for the 2009 survey Sakhalin Energy make every effort to secure a vessel with the capability of towing as many streamers as possible in addition to the six used previously. Sakhalin Energy reported that the vessel will probably be the 'Pacific Explorer', and it will operate with only six streamers. This revelation was disappointing as it seems to indicate a lack of effort on the part of Sakhalin Energy to pursue the idea of lowering source levels, and thus reducing risks to whales, in future seismic surveys. Sakhalin Energy reported that it had tendered for vessels with more streamers but concluded that the received bids were commercially unacceptable. It also reported that more streamers would cause artefacts in the seismic image due to changed offset characteristics in the seismic data, and that those artefacts in the seismic amplitudes and times could be in the same order as the 4D signal. No further explanatory information was provided on this matter or on the nature and extent of the company's efforts to secure a vessel with additional streamers.

The Task Force had also made a more general recommendation that Sakhalin Energy fully explore further measures (such as the use of coherent sound coupled with improved analytical techniques) that would allow future surveys to be conducted at lower sound energy levels. Although Sakhalin Energy reported that it had investigated with geophysical contractors some such measures (*e.g.* use of directional sources), it had concluded that these techniques could not be applied in the planned survey. No significant progress on this recommendation was reported at the meeting.

The Task Force had emphasised the lack of information on the potential impact of seismic surveying on gray whales, and stressed the importance of ensuring that we are not still in this situation the next time a survey is planned in or near western gray whale habitat. It therefore had strongly recommended that a group of experts be asked to work with Sakhalin Energy to develop a fully specified field plan and analysis proposal, before the plans for monitoring in 2009 are finalised. The Terms of Reference for such an expert group (Doc. WGWAP-5/12) had been circulated by IUCN in September and agreed by the Task Force.

At WGWAP-4 the Panel had further recommended that Sakhalin Energy investigate the possibility of having an independent observer present on the seismic vessel during the survey. Bell reported that the observer would need to be a Russian national and have the required permit. However, he considered it unlikely that the vessel could accommodate an additional person. The Panel regrets this and notes that there has been positive experience with the placement of independent observers on seismic vessels in the Gulf of Mexico and elsewhere. It strongly **urges** that every effort be made to enable an observer to be present.

12.3 Update on completion of intersessional tasks

12.3.1 Real-time calibration

Sakhalin Energy confirmed its agreement that a small group of experts, including Panel members, would review received levels at the perimeter monitoring line from the initial shooting of some of the more offshore lines in the survey pattern. The group will use these results to calibrate and verify the JASCO model and make adjustments, if and as necessary, to the monitoring and mitigation procedures. The exact mechanism for implementing this planned real-time calibration task remains to be developed but it will be taken up by the Seismic Survey Task Force at its meeting in late January (see Agenda Item 12.3.7).

Nowacek raised a number of practical and technical issues concerning data, noting that there is a difference between source verification procedures and calibration of the model.

The 180 dB injury threshold area around the source vessel will need to be established during the source verification procedures, *i.e.* separately from the model calibration. Precisely which data are reported as part of the real-time calibration will be specified by the Task Force.

12.3.2 Results of the JASCO modelling work

Two separate comparisons of modelling approaches have been carried out. The first took place as part of the initial meeting of the Seismic Survey Task Force in May 2007 (http://cmsdata.iucn.org/downloads/seismic_tf_report_final_20_09_07_with_caution_20_05_08_1.pdf). JASCO and the Russian group (Avilov and Vedenev) both modelled the propagation of noise from the airgun array in the proposed survey area into the near-shore (Piltun) feeding area. Results indicated reasonable agreement between the models despite the differences in methodology. Subsequent to that meeting, additional datasets became available that could be used to test the models. Specifically, the results from the 2001 ENL seismic survey were published (Rutenko *et al.* 2007) and another, smaller dataset recorded by Bernd Würsig and Dave Weller became available to the Task Force. JASCO tested its model against the recordings published by ENL and found good agreement with those measurements (see report of the Seismic Survey Task Force, WGWAP-4, Annex D). Following WGWAP-4, JASCO and the Russian group tested their respective models against the Würsig/Weller data. The results are found in WGWAP-9, 14, 15 and 16.

Racca noted that the JASCO model had produced higher estimates of transmission loss (*i.e.* lower received levels) than the Avilov model and indeed than the Würsig/Weller recordings, and he acknowledged that the discrepancy appeared to be significant. However, in his opinion, the discrepancy can be explained by the difference between the two models in the assumptions made about the nature of sound propagation in the water column and through the sediment. The JASCO model takes into account the loss of waterborne acoustic energy that occurs at low angles of incidence (typical of shallow-water propagation) due to the conversion of compressional waves in the water column to shear waves in the sediment. Racca agreed with the statement made by Avilov (the main developer of the Russian model) that propagation of shear wave energy in the sediment and subsequent retransmission to the water column is limited. As such, the shear waves do not contribute to the received levels, so these are not explicitly considered in the JASCO model. However, the loss of energy is taken into account and the related transmission losses are considerable over distance. In a zero shear-wave situation the JASCO model results are comparable to the Russian model. Racca contends that consideration of shear-wave energy is the primary reason for the difference between the two models, and indeed he considers the JASCO model to be more accurate, primarily based on the results of transmission loss experiments and other validation exercises.

Vedenev welcomed the presentation by Racca and acknowledged that it had illustrated certain advantages of the JASCO programme. However, he pointed out some disadvantages that had not been adequately addressed in the presentation. The JASCO model does not take into account the compressional velocity gradients in the sediments nor the complexity of frequency dispersion; these are potentially serious shortcomings. The JASCO model instead treats the sea bottom as an isovelocity layer, ignoring the gradient structure that likely exists. Specifically, it uses the high shear sound speed value immediately as the sound enters the sediment, while in reality the sound velocity has a gradient structure, varying from very small values near the surface of the bottom to some greater values at depth. Thus, the JASCO model fails to take into account the velocity gradient in the upper layers of the bottom, which are characterised by low shear speed values and thus

attenuation. In the opinion of Vedenev and Avilov, this leads the JASCO model to underestimate the sound energy level (SEL) received at a given location down-range. That bottom compressional sound speed gradients are at least as relevant as shear waves has been demonstrated in the literature (Giles 2006). In this regard, the Panel would have welcomed the refinement of a model that more accurately reflects the real geological conformation, but such a model was not available for consideration at the meeting.

It was the position of Vedenev and Avilov that the JASCO model incompletely accounts for non-consolidated sediments (*i.e.* those capable of transmitting a compressional wave) known to exist on the Sakhalin shelf. Racca maintained that the JASCO model has been validated by direct measurements, but he found the divergence between the two models that occurs at long ranges intriguing and admitted that it may indeed indicate the presence of more compressional transmission through the sediment than the JASCO model allows.

Nowacek noted that the issue of shear wave propagation is not necessarily a binary function and depends on characteristics of the substrate. Some sounds are transmitted through solids with certain characteristics even faster than through water, and without direct measurements of sound speed profiles through the various layers of the sediment, any modelling must be regarded as less than fully informed. Indeed, models are only attempts to replicate or predict reality and hence the source verification and calibration measurements remain vital.

At this point, the Panel does not believe that additional modelling is necessary in preparation for the 2009 seismic survey. The modelling work has been extremely valuable in giving both the Panel and Sakhalin Energy a better understanding of the sound-transmission issue and in helping the Seismic Survey Task Force estimate (and ultimately manage) the amount of sound energy that will impinge on the whale feeding area during the survey but additional modelling would not significantly change the monitoring and mitigation plans already agreed and in motion. The identified discrepancies reconfirm the importance of the source verification procedures, which could reveal, for example, different directionality characteristics in the source that would, in turn, result in more or less sound energy reaching the feeding area than predicted. Likewise, the real-time calibration experiments remain essential for the successful implementation of the monitoring and mitigation measures.

12.3.3 Results of the 95% kernel analysis

No written document was provided but Muir displayed results for the datasets agreed by the Task Force: 2005-2007 seasons combined, for (a) June-July and (b) August-September, using (i) average and (ii) maximum densities for each 1 km × 1 km square.

A review of methods used to estimate whale densities, the Piltun feeding area boundary and the number of ensonified whales had been prepared by David Borchers of the University of St Andrews at the request of Sakhalin Energy (document WGWAP-5/17). The review noted that the density analysis as currently implemented assigns a zero density to cells without survey effort, introducing negative bias in the estimated number of ensonified whales and negative bias in the estimated size of the feeding area. It was noted that if the unsurveyed cells contain low or zero whale densities, such negative bias would be small. Although the review considered the methods used to estimate the area within which 95% of the whales were expected to occur, and to estimate the number of whales ensonified above a threshold level, to be reasonable, it recommended using a model-based approach, such as fitting Generalised Additive Models with explanatory variables, to integrate both systematic and non-systematic sightings (see 12.3.4, below), and to avoid the assumption of zero density in

unsurveyed areas. However, the amount of work involved in applying such an approach was estimated to be quite large (about 6 person-months).

The Panel noted that the key question of whether information on the density of whales in cells with no survey effort might be available from other sources was addressed under the next agenda item.

12.3.4 Results of analysis of inclusion of non-systematic sightings

Inclusion of non-systematic sightings had been recommended by the Task Force and by the Panel at WGWAP-4 because the distribution of gray whales appears to extend well beyond (seaward of) the area of systematic surveys, albeit at lower densities.

The Panel considered that the approach recommended in document WGWAP-5/17 would be the most appropriate in principle but, in view of the amount of work involved, considered that as a first step (and as originally recommended) the data should be summarised in a suitable form for inspection. Based on a small-group discussion with Sakhalin Energy contractors and panel members, the Panel requests that the following tabulations be prepared and circulated to the Task Force:

1. Calculate an index of relative density at 5 km x 5 km resolution. Perform calculations for two grids that are offset 2 to 2.5 km (exact distance to be decided) in an east-west direction to test the sensitivity of the index to grid cell location with respect to shore. Make calculations for two time periods: June-July and August-September, and for each year of 2005-2007 and pooled across 2005-2007 (as per methods used by the Seismic Survey Task Force).
2. Calculate an index of relative density as number of sightings/hour within each 5 km² grid cell for all non-systematic (Platform of Opportunity or MMO) data.
3. Calculate an index of relative density as number of sightings/km sailed within each 5 km² grid cell for moving vessels that have GPS tracks.
4. Provide results for number of sightings, effort (either total hours or total km sailed) and index of relative density for all grid cells.

Based on inspection of these results, the Task Force should consider what statistical analyses would be useful to perform on these data. The Panel **recommends** that these tabulations be available in time for inspection at the proposed Task Force workshop to be held at the end of January 2009 (see 12.3.7, below).

12.3.5 Revised maps and perimeter monitoring line

The Panel and Sakhalin Energy agreed that densities by 1 km × 1 km square from systematic surveys as reported under Agenda Item 12.3.3 should be recalculated with corrections for distance bias. At a minimum, the correction should involve the refraction correction (Leaper and Gordon 2001). Because the actual negative bias in distance estimates tends to be substantially more than can be explained by refraction alone, the Panel **recommends** that an empirical distance bias correction be estimated from the comparison of vessel and shore-based sightings. The first step is to compile the sightings and determine sample size. The Panel **requests** that the compilation be available in time for the Task Force workshop scheduled for the end of January 2009.

12.3.6 Final coordinates for monitoring line

The Panel anticipates that the co-ordinates of the monitoring line will be finalised by the Task Force when the information requested under Agenda Items 12.3.4 and 12.3.5 is available.

12.3.7 Terms of Reference for seismic survey expert group

As agreed at WGWAP-4, it is essential for data to be collected that will allow measurement of the effects of the seismic survey on gray whales. Otherwise, the same problem of insufficient knowledge will prevail the next time a seismic survey is proposed. A monitoring plan is required that will ensure that the data collected have the power to detect significant effects on the whales, if there are any. Because the Task Force had neither the time nor all of the required expertise to develop such a plan, it had been agreed at WGWAP-4 that a workshop should be held with appropriate invited experts.

The proposed Terms of Reference for such a workshop had been circulated to the Task Force in September 2008 and at WGWAP-5 the Panel and Sakhalin Energy agreed the revised Terms of Reference contained in WGWAP-5/12 (appended as Annex 5 of this report).

Sakhalin Energy and the Panel agreed that a 3-day workshop of the Task Force would be held in Vancouver from 31 January to 2 February 2009. A list of invitees was drawn up in consultation between the Panel and Sakhalin Energy. The Panel will approach alternative experts if persons on the initial list are unable to attend.

13 OIL SPILL PREVENTION, PREPAREDNESS AND RESPONSE

13.1 Update on implementation of recommendations

From the Panel's perspective, it was impossible to make any progress with regard to oil spill response (OSR)-related recommendations from WGWAP-3 and WGWAP-4 (see document WGWAP-5/13 for details) because Sakhalin Energy had not provided the requested documentation well in advance of WGWAP-5, as had been agreed. Consequently, the expected Panel review of OSR plans and the Panel's assessment of potential changes in oil spill risks to the whales could not be accomplished. However, during the meeting Sakhalin Energy provided copies of the current OSR plans for Lunskeye, PA-B and the Prigorodnoye terminal at Aniva Bay, and also the latest information on characteristics of Vityaz crude oil for review by the Panel. Although Dicks had thus started his review of these documents and his comparison of the plans with the respective OSR handbooks to verify consistency, it was premature at WGWAP-5 to offer technical comments.

13.2 Update on completion of intersessional tasks

The main intersessional task was to conduct a follow-up visit to Sakhalin Energy's oil spill response bases on Sakhalin Island. The intention was for Dicks (and possibly at least one other Panel member) to revisit Sakhalin Energy's OSR equipment stockpiles and evaluate progress with regard to resource placement, site operations and staff training. This visit was to be piggy-backed onto the proposed activities of the Environmental Monitoring Task Force. However, as reported under Agenda Item 10.2, it had become apparent prior to September 2008 (the latest feasible time for the visit) that competing obligations would interfere with Sakhalin Energy's ability to host the proposed site visit by the Panel members

of the task force. The site visit remains a priority for the Panel, however, and it was **agreed** that the site visit to Sakhalin would be scheduled for July or August 2009.

It was noted at WGWAP-4 that PCCI, on behalf of the lenders, had made a comprehensive review of Sakhalin Energy's OSR plans, and the Panel had recommended that the documents be provided for its review and comment (WGWAP 4/021). Sakhalin Energy had indicated that this would be done in or before August 2008, but no documents had been provided by the time of WGWAP-5. Besides expecting Sakhalin Energy to follow through with its agreement to provide these documents, the Panel suggests that the proposed site visit in summer 2009 also involve PCCI in order to facilitate face-to-face discussions of oil spill planning and response issues between the lenders' reviewers and Panel members.

Yablokov and Tsidulko drew the Panel's attention to reports from Russian sources indicating that both Sakhalin Energy and ENL had applied to Russian authorities for pre-approval of dispersant use as an OSR option in Sakhalin waters. Bell explained that it was normal for companies to do this and that any pre-approval would be expected to come with conditions regarding the actual use of these chemicals in the field – *e.g.* they could only be used in waters deeper than a specified depth. After some discussion, Bell reaffirmed that Sakhalin Energy was committed to following a 'common sense' approach and would not use dispersant chemicals in situations where there is any possibility of residue reaching and contaminating western gray whale feeding habitat. The Panel **requested** to see Sakhalin Energy's NEBA (net environmental benefit assessment) documentation presented to the Russian authorities in support of the pre-approval application and Bell **agreed** to provide this.

14 FUTURE SAKHALIN ENERGY PLANS FOR WESTERN GRAY WHALE MONITORING AND RESEARCH

14.1 Presentation by the panel on what is needed for an adequate Sakhalin Energy research and monitoring plan

The Panel's discussions of this item began at WGWAP-3. At that time, both the Panel and Sakhalin Energy had hoped that a co-operative approach would lead to an agreed, comprehensive research and monitoring programme. In that context the Panel provided intersessional advice on a draft scope of work in January 2008 and at WGWAP-4 the Panel received a description of the joint Sakhalin Energy-ENL programme for 2008-2010 (WGWAP-4/INF.19).

The report of WGWAP-4 (section 12.1) clearly illustrates that a suitable *modus operandi* for meaningful input by the Panel into this programme has not been found. In its conclusion of the discussion at WGWAP-4, the Panel reached the following conclusion.

“... although the research and monitoring programme outlined in WGWAP 4/INF.19 appears ambitious, it lacks the necessary technical detail on how the data and information will be collected, analysed and integrated. Some of this detail may be included, explicitly or implicitly, in previous annual reports but it needs to be drawn together in a single document. The Panel reiterates its support for a comprehensive, well-designed research and monitoring programme and its willingness to advise on its design. However, for this to be an efficient process, it is essential that a better-developed draft programme that contains the necessary detail on objectives, data collection protocols and analytical techniques (for both individual components and integrated analyses) be made available for review. Therefore, the Panel **recommends** that Larsen, in cooperation with the Panel and SEIC, coordinates the development of a proposal as to how such a review can be undertaken, to be presented at WGWAP-5.”

The Panel recognises that despite the lack of detail and the consideration of integrated analyses, there are a number of good aspects to the programme. It is extremely unfortunate

that, despite the efforts of Larsen and the Panel, the above recommendation has not been implemented. The Panel had hoped that its participation in the development of the programme would follow the same co-operative and pro-active approach that has been apparent in the work of the task forces. Rather than repeat its recommendation yet again, the Panel believes it is more appropriate that this item not be placed on future meeting agendas unless and until Sakhalin Energy indicates a willingness to participate actively in the process. Meanwhile, the recommendation should remain in the master list of recommendations as ‘closed but not implemented satisfactorily’.

The Panel recognises that there may be a number of reasons why this situation has arisen. For example, the primary aim of the companies involved is to satisfy legal requirements in the most cost-effective way (although given the expense already involved in the 2008-2010 programme as specified, it would seem also in the interests of the companies to ensure that the best possible results are obtained from the studies they sponsor). From the Panel’s perspective, the primary aims of research and monitoring are to provide a scientific basis for long-term monitoring of the status of western gray whales, particularly in the light of the anthropogenic activities on the feeding grounds, to ensure that appropriate mitigation measures are in place for whatever activities are occurring, and to evaluate the effectiveness of those measures. The Panel’s broader perspective therefore has significant implications for such a programme in terms of data collection and analysis. The monitoring effort must be adequate to detect changes in whale abundance and distribution over time, should they occur, and, where possible, to link such changes to environmental and anthropogenic factors.

Whilst the companies indicate that they will develop additional programme components for specific circumstances, the short-term expansion of monitoring during a particular activity may not be sufficient to allow adequate evaluation of effects or ensure the success of mitigation measures. The recent reduction of the field season from 90 to 75 days is a case in point. Also, the lack of specificity with respect to anthropogenic activities expected even within the three-year period is particularly disappointing as this information is essential to help determine effectiveness or otherwise of the programme; this is not the first time the Panel has requested such information.

The Panel recognises that the two companies involved (*i.e.* Sakhalin Energy and ENL) do not see why the sole monitoring and research burden should be placed upon them. However, the task of the Panel is to provide the best advice with respect to the conservation of western gray whales.

Despite the above comments, there are a number of ways in which the current activities of the Panel and others can improve the situation:

- Active participation in fulfilling the agreed recommendations of the Photo-identification Task Force (see Item 6);
- Co-operation in the non-panel proposal for a workshop on integrated analyses arising out of discussions of MVA analyses (see Item 8);
- Active participation in the expert group recommended by the Seismic Survey Task Force (see Item 12);
- Active participation in the Environmental Monitoring Task Force (see Item 10).

Without some progress on these matters, the value of the Panel approach (and the commitment of Sakhalin Energy to it) will be severely compromised.

14.2 Update on JIP proposal on controlled exposure experiments on gray whales

Roger Gentry, program manager of the Sound and Marine Life component of the Joint Industry Program (JIP) organised under the auspices of the International Association of Oil and Gas Producers (OGP), reported (via Nowacek) that neither of the two proposals submitted in response to the JIP request for proposals had focussed on gray whales. In fact, Nowacek and several colleagues had submitted materials to the JIP proposing to include eastern gray whales in a behavioural response study using airguns as one of the stimuli.

JIP was negotiating with a study team (coordinated by Nick Gales) to develop a proposal to expose humpback whales off the east coast of Australia to airgun sounds, compare their behavioural responses to the long-term baseline established by other Australian researchers, and then expose animals on the opposite (west) coast of Australia and compare their responses. Experimental design, including tags to be used and data outputs, had yet to be decided. If the JIP decides to support this project, funding would extend through 2011 or 2012.

Gentry further noted (via Nowacek) that the JIP support and evaluation process incorporates the views of member companies on the relevance of a given topic and that none of the partner companies in the JIP (Sakhalin Energy is not a member) had made the case for a study of feeding gray whales.

The Panel had recommended previously (Recommendation WGWAP 4/025) that Sakhalin Energy support (*e.g.* financially, logistically), through a well-established program such as the JIP, one or more controlled exposure experiments involving airgun noise and eastern gray whales in a feeding area. At WGWAP-5, Sakhalin Energy confirmed that it had a clear interest in improved understanding of the effects of seismic airgun activity on the behaviour of feeding gray whales. The Panel reaffirms its previous recommendation that Sakhalin Energy should support relevant studies, whether they take place under the aegis of the JIP or some other programme. As Sakhalin Energy and other companies have plans for periodic seismic surveys on the Sakhalin shelf over approximately the next 50 years, it remains incumbent on those companies to support efforts to improve understanding of the effects of airgun noise on feeding gray whales. The monitoring and sampling efforts being designed to accompany the 2009 Astokh 4-D survey will be extremely valuable but should not be seen as a substitute for a rigorous scientific study of such effects.

15 NON-SAKHALIN ENERGY GROUPS MONITORING

Groups independent of the oil companies have conducted research and monitoring of gray whales off north-eastern Sakhalin Island in recent years, and the Panel reaffirms its position (as stated in section 15 of the WGWAP-2 report) that it welcomes opportunities to comment on those groups' plans and results. However, to comment meaningfully, the Panel requires written documentation well in advance of meetings to ensure adequate time for review. The Panel also reaffirms that although monitoring by independent groups is valuable and to be encouraged, it is important that they make every effort to minimise disturbance to the whales while conducting fieldwork. Further, such groups are encouraged to provide information about field activities that may be relevant to the interpretation of acoustic data collected in the study area.

In this regard, the potential disturbance of whales by close approaches necessary for photo-ID studies (of both the IBM team and the Russia-US team) was discussed briefly at this meeting, as it had been at a number of past WGWAP meetings. Certain tasks outlined by the Photo-ID Task Force (see Agenda Item 6.1 - Tasks 8 and 9) were designed to examine

the issue of overlap in survey coverage and to begin evaluating potential disturbance effects. However, as no progress has yet been made regarding these tasks, the matter remains unresolved. In addition to the outstanding tasks of the Photo-ID Task Force, the Panel **recommends** that Gailey carry out an analysis that compares the disturbance caused by boats of the IBM photo-ID team vs. the boat of the Russia-US team. Such an analysis would help assess whether the approach strategy of one boat or another elicits different types or degrees of response by the whales. It was hoped that Gailey would be able to report the results of this analysis at WGWAP-6.

Coordination of effort in the 2009 field season is important both to avoid unnecessary disturbance to the whales and to optimise data collection before, during and immediately following the seismic survey. This matter is referred to the Seismic Survey Task Force for further consideration.

15.1 Russia-US Team

Information on the Russia-US team's work in 2008 is summarized under Agenda Items 5.2 and 6.3. The discussion under this item focused on plans for 2009.

Weller and Tsidulko reported that the current plan was to conduct a programme similar to that in 2008, with the possible additions (pending funding) of: (i) resumed biopsy work targeting newly identified individuals as well as previously unsampled whales in the photo-ID catalogue and (ii) a lighthouse-based component to monitor whale numbers and distribution during the planned Astokh 4-D seismic survey. Tsidulko noted that IFAW intends to provide support to the Institute of Oceanography of the Russian Academy of Sciences so that some level of independent acoustic monitoring will take place during the seismic survey in 2009. In response to a question concerning such work, Vedenev advised that the buoys deployed by the Institute of Oceanography would be placed along the perimeter of the Piltun feeding area and their exact positions would be provided to all concerned well in advance. The Panel urges that the Seismic Survey Task Force try to consider all aspects of acoustic monitoring, including issues related to the potential disturbance of whales caused by buoy-tending vessels.

15.2 WWF, IFAW

The contribution by IFAW in the 2008 season was in the form of providing financial support to the Russia-US research team. No information was presented on WWF activities at Sakhalin in 2008.

15.3 Update on proposed Piltun Protected Area

Aleksey Knizhnikov of WWF Russia provided information (via Tsidulko in an e-mail message during the meeting) indicating that a formal proposal for a protected area in the Piltun area had been completed and submitted to the Ministry of Natural Resources. The proposal has also been sent to the Sakhalin Administration for feedback. An environmental impact assessment ('expertisa') may be required.

16 ACTIVITY BY OTHER COMPANIES

The Panel received information from Knizhnikov on the Elvary 2-D seismic survey in the Kaigan-Vasjukanskiy area immediately north of the Piltun feeding area. The survey took place from 5 September to 10 October 2008 and involved a 4.5 km-long airgun array towed at 6 m depth. The far south-western part of the survey area (which overlaps directly with the

near-shore gray whale feeding area) was excluded in response to requests by NGOs; exact coordinates of the excluded area were not available to Knizhnikov. Marine mammal observers (from the Institute of Marine Biology) were onboard the seismic vessel with authority to order suspension of operations if gray whales were seen within 4000 m; no such situations arose. Two gray whale sightings were made during the survey and 12 more on the vessel's transit leg to the survey area. According to Knizhnikov, a full written report on the survey, including detailed maps of the survey tracks and the coordinates for whale sightings, would be available early in 2009. He also reported that Elvary was considering participation in the WGWAP process.

The Panel recalled that a monthly Sakhalin industry newsletter ('Sakhalin Oil & Gas', produced and distributed by the Pacific Russia Information Group) had been at least occasionally useful in the past as a source of information on what various companies were doing and planning to do. Larsen noted that he had been receiving this newsletter only irregularly since April, the most recent issue having been received on 3 September 2008. He agreed to follow up on this and ensure that both the Panel and Sakhalin Energy are kept as up-to-date as possible with information.

17 UPDATE ON PROPOSED ACTIVITY ON THE SAKHALIN SHELF

Apart from the information provided by Sakhalin Energy, the Panel had available at WGWAP-5 only fragmentary and anecdotal information on the nature, timing and extent of industrial activities during the 2008 season. It also had only limited and preliminary data on the abundance and distribution of whales in the 2008 season, most of which was provided by the Russia-US research team; as noted under Agenda Items 1.2 and 5.1, data from the joint Sakhalin Energy /ENL monitoring programme had not yet been fully analysed and therefore were not presented. The available information, however, suggested that the number of whales was exceptionally low (as compared to previous years) in the near-shore feeding area in July and August of 2008. This scarcity may have been related to underwater noise¹ produced during onshore pile-driving activities undertaken by ENL on the northern Piltun barrier spit adjacent to the Odoptu block.

A precautionary response to the present situation would be to establish a moratorium on all industrial activities, both maritime and terrestrial, that have the potential to disturb gray whales in summer and autumn on and near their main feeding areas. Such a moratorium should remain in effect until: (i) adequate information is available on both the industrial activities that took place and on the distribution and behaviour of the whales during summer 2008; and (ii) a comprehensive plan, covering the activities of all operators, has been developed and implemented to manage and mitigate the effects of industrial activities on gray whales on the Sakhalin shelf. This latter requirement would ensure that the WGWAP is able to obtain: (i) advance information on planned industrial activities of all operators (not only Sakhalin Energy), (ii) timely information on industrial activities that have occurred and (iii) up-to-date data on whale distribution and behaviour. Only in this way can the Panel be expected to work successfully towards western gray whale conservation and meet its Terms of Reference, which refer to the need for 'access to all the relevant

¹Received levels for transient pile-driving noise recorded 1 km from a man-made island (near Prudhoe Bay, Alaska) were 25-35 dB above ambient in the 50 to 200 Hz band (Moore *et al.* 1984). Sounds of this nature might be received underwater as far as 10-15 km from the source (Richardson *et al.* 1995).

information and data from all interested parties’ and which bind the Panel to ‘interpret both existing knowledge and information gaps in a manner that reflects precaution’.

The Panel recognises that, in view of the many activities undertaken by other companies, such a measure is beyond the scope of Sakhalin Energy alone. Nonetheless, the Panel **recommends** that Sakhalin Energy work with relevant parties, including but not necessarily limited to Russian authorities and other oil and gas companies operating on the Sakhalin shelf, to jointly establish a western gray whale management plan. The Panel further **recommends** that a moratorium be implemented on industrial activities, carried out by Sakhalin Energy and all other Sakhalin-based oil and gas companies, that might be expected, in the absence of *independently* verified mitigation measures (such as those developed by the Seismic Survey Task Force for seismic surveys), to disturb gray whales in and near their main feeding areas during the primary summer/autumn feeding season (July through October). This moratorium should remain in place until: (i) a satisfactory management plan is in place and (ii) the information flows required for its successful operation are functioning.

In view of the uncertainty raised at this meeting concerning the numbers and distribution of western gray whales during the 2008 season (and possible links with industrial activities), it would be precautionary for the planned Astokh 4-D seismic survey to be put on hold until more information is available about industrial activities and whale distribution in 2008, and preferably also until data from 2009 are available that might indicate whether the distribution has returned to ‘normal’.

In the event that Sakhalin Energy is already contractually obligated to conduct the seismic survey in 2009, then the primary recommendation by the Seismic Survey Task Force that the survey be completed as early in the season as possible, before the period of peak whale abundance, remains the highest-priority mitigation measure (see also Agenda Item 12).

The Panel remains concerned that the present Sakhalin Energy plans allow, in the event of operational delays, for the survey to be conducted later in the season. Given that mothers with calves tend to be among the first whales photo-identified early in the feeding season (Weller *et al.* 1999), and probably have the greatest energetic requirements of all population components, any detrimental effect on their feeding rates that continued beyond mid-July could have significant demographic implications. The Panel **requests** that Sakhalin Energy provide a realistic estimate of when it expects to complete the survey, and list the factors (other than the obvious ones such as ice and weather conditions) that could contribute to a delay, and that this information be submitted to the Seismic Survey Task Force workshop at the end of January 2009. Depending on the response, the Panel may make a more specific recommendation regarding the date in the season beyond which no seismic surveying that ensionifies the feeding area should be conducted.

Further, and also in the event that Sakhalin Energy is contractually committed to conduct the Astokh 4-D survey in 2009, the Panel **requests** that Sakhalin Energy obtain from the contractor information on whether it has scheduled further seismic surveys on the Sakhalin shelf in 2009 after the Sakhalin Energy survey, and permission to pass this information on to the Panel as soon as possible.

18 EXPLICIT DISCUSSION OF WGWAP MODUS OPERANDI, POTENTIAL REVISION OF TOR, STRUCTURE AND SCHEDULE OF PANEL MEETINGS

Elsewhere in this report, the Panel has set forth its concerns and frustrations in regard to the WGWAP process and how it has functioned to date. The lack of recent progress on various

matters, primarily as a result of inadequate provision of data and information, has led Panel members to question whether the process is serving its central purpose: to promote the necessary protection for this critically endangered whale population and thus improve its chances for full recovery. As a result, unless there is significant and immediate improvement, members are increasingly reluctant to continue investing their time and energies in a process that seems to be of questionable effectiveness.

Most importantly and immediately, as discussed under Agenda Items 5 and 16, there is urgent concern about the preliminary evidence suggesting an anomalous pattern of gray whale occurrence and distribution off Sakhalin in summer 2008 and the possible relationship of this pattern to industrial activity. A full scientific analysis of all available data will be necessary to determine whether the observations in 2008 are a reflection of natural variation in the environment or a result of disturbance by human activities. Such an analysis will require not only a full evaluation of the scientific and environmental monitoring results of Sakhalin Energy and others but also a detailed understanding of recent and ongoing human activities in the region.

In the course of its existence, the Panel, in keeping with its Terms of Reference, has sought to understand the behaviour of the whales and the dynamics of their population in the context of human activities, particularly and specifically those associated with offshore oil and gas development. Because Sakhalin Energy is the only company to have engaged with the WGWAP process thus far, its activities have been the primary focus of the Panel's deliberations and recommendations. However, it has long been evident that the dynamics and health of the western gray whale population could also be significantly influenced by the activities of other oil and gas companies operating in the region.

In the Panel's view, the reported offshore activities by Sakhalin Energy in summer 2008 (*e.g.* related to pipeline and platform maintenance) cannot plausibly be linked to the anomalous pattern of whale occurrence and distribution observed in that year. However, despite many previous attempts to obtain official information on the activities of other companies, the only such information available to the Panel at WGWAP-5 was anecdotal and referred to: (i) extensive pile-driving activities by ENL on the sand spit separating Piltun Lagoon from the Okhotsk Sea (information obtained opportunistically by independent field researchers; see Agenda Item 5.2) and (ii) the Elvary seismic survey in August-September to the north of the feeding area (information obtained from WWF Russia; see Agenda Item 16). The pile-driving site is immediately adjacent to the nearshore Piltun feeding area, which is used preferentially by adult female gray whales with dependent calves. It is clear that without timely, authoritative information on all relevant human activities in the region, and not just those carried out by Sakhalin Energy, the Panel is unable to do its job of assessing the population and providing scientific advice on conservation and mitigation. This point was made previously by the Panel in its open letter to Prime Minister Vladimir Putin of the Russian Federation, released 10 July 2008 and posted on the IUCN website (http://cmsdata.iucn.org/downloads/open_letter_Putin_en_100708_1.pdf).

As stressed under Agenda Item 14, the provision of effective conservation and mitigation advice on western gray whales requires adequate monitoring of the whales themselves, their natural environment and all human activities that potentially threaten them, irrespective of the source. Just as the responses by the whales do not discriminate according to which company or other entity is causing a disturbance, our understanding of anthropogenic effects cannot discriminate based on the corporate identity of various actors. The Panel stresses that it is not interested in attributing blame; it has no wish to indulge in public

criticism of any company active in the oil and gas industry off Sakhalin or elsewhere. Rather, its primary aim is to identify activities that are affecting, or that have the potential to affect, the western gray whale population and to provide effective advice on conservation and mitigation. In pursuing that aim, the Panel expects to work closely and constructively with IUCN and various other conservation organizations as well as with companies operating in the region.

The Panel's Terms of Reference state that it 'must have access to all the relevant information and data from all interested parties'. Moreover, within the scope of its mandate, the Panel is "free to seek any information that it decides is necessary and relevant". Therefore, once again, the Panel stresses that the delivery of two types of information or data must be improved for the WGWAP process to function as intended.

Firstly, information on plans and schedules for activities taking place in or near western gray whale habitat needs to be provided in a timely manner. Examples of activities of particular interest are: (i) seismic surveys, (ii) construction of exploration, production or transport facilities and (iii) shipping. Such information is crucial to informed evaluation of scientific data on whale distribution, movements, behaviour and population dynamics. This information is most useful for mitigation when it is provided as soon as an activity is scheduled, and well before it actually takes place.

Secondly, the Panel needs timely access to scientific data. It is understood that the release of technical data by any investigator is contingent on adequate time for organization, data validation, analysis and internal checking; the provision of poor analyses, however quickly, is not helpful. The Panel's work has often been hampered by the fact that much of the research and monitoring carried out in the gray whale feeding areas is undertaken as part of a joint Sakhalin Energy-ENL programme and as such requires authorization by both companies before data and analyses can be released. A number of requests by the Panel for data from Sakhalin Energy have been substantially delayed or denied because of confidentiality agreements. In such cases, Sakhalin Energy has reported an inability to share data with the Panel, citing ENL's unwillingness to cooperate. The Panel recognises the unfortunate situation whereby ENL does not see any advantage to its participation in the Panel process. However, it is unclear how a refusal to share jointly collected data, once the normal scientific validation and analysis process has been completed, could possibly be to the advantage of ENL and it certainly impedes the cause of western gray whale conservation.

The Panel has been encouraged by recent informal discussions with ENL representatives indicating that ENL may be willing to authorise the sharing of data where the scientific objective and conservation value of doing so have been demonstrated – the work of the Photo-identification Task Force is a case in point (see Agenda Item 6). In this regard, it is useful to call attention to the Panel's recently adopted data availability guidelines that were developed to safeguard the rights of data holders (see Agenda Item 8.2). The Panel hopes that the situation continues to improve and that mutual trust can be established. It also recognises the value of shared research and monitoring programmes from a number of standpoints, including not only cost savings but also the minimisation of disturbance to whales whilst collecting essential data. However, should the situation deteriorate rather than improve, then the Panel would encourage Sakhalin Energy to reconsider the confidentiality aspects of joint agreements. As noted above, the timely, unencumbered access to relevant information and data is not an optional aspect of the Panel's remit; it is a central imperative for the WGWAP process to be effective in achieving its conservation objectives. Unless

and until this issue is resolved, the effectiveness of the Panel and Sakhalin Energy's stated commitment to western gray whale conservation will be severely compromised.

In conclusion, the Panel **urgently requests** that government agencies and officials in Russia, IUCN, Sakhalin Energy, other companies active in all aspects of the oil and gas industry on the north-eastern Sakhalin shelf, lending institutions, the Group for Strategic Planning on Western Gray Whales, non-governmental conservation organizations, and all other interested parties make a commitment to cooperate and collaborate with the Panel by providing the types of information and data as outlined above.

19 ANY OTHER BUSINESS

There was a brief discussion of the response received (via IUCN) to the Panel's open letter to Prime Minister Vladimir Putin of the Russian Federation last July concerning the need for greater access to data and information. In its response letter, the Russian Ministry of Natural Resources cites the strategic planning group, established under the Russian Academy of Sciences and headed by Yablokov, as the body responsible within Russia for coordinating research on western gray whales. The letter also gives assurances that companies operating on the Sakhalin Shelf meet legal requirements and regularly share the results of their whale monitoring programmes with Russian scientists and government officials. Larsen indicated that IUCN planned to respond to the letter from the Ministry of Natural Resources and to use it as an opportunity to establish closer communication links with Russian authorities. The Panel recognises the potentially high value of such links and therefore welcomes and encourages this initiative by IUCN.

The Panel was advised of progress on the formal evaluation of WGWAP being carried out by Stephen Turner on behalf of IUCN. Turner's final report is expected early in 2009.

It was tentatively agreed that WGWAP-6 would take place in the third week of April 2009, probably in Switzerland.

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SUMMARY OF RECOMMENDATIONS FROM THE 5TH MEETING OF THE GWAP

Recommendation number	Cross-Reference	GWAP Recommendation & Requests	Responsible Party	Target Completion Date	Sakhalin Energy Response
ITEM 1: OPENING					
GWAP-5/001	Section 1.2	The Panel stressed that it expected full reports including results to be made available well in advance of the next GWAP meeting.	Sakhalin Energy	End of March 2009	
ITEM 5: PRELIMINARY RESULTS OF 2008 WESTERN GRAY WHALE DISTRIBUTION AND BEHAVIOUR MONITORING					
GWAP-5/002	Section 5.2	The Panel recommends that access to such data be provided in good time before its next meeting in order to help evaluate the possibility of a causal relationship between industrial noise and whale numbers/distribution.	Sakhalin Energy	End of March 2009	
ITEM 6: PHOTO-IDENTIFICATION					
GWAP-5/003	Section 6.4	The Panel reiterates the great importance it attaches to the work of this Task Force. It sees the timely co-operation of Sakhalin Energy in this work as symbolic of Sakhalin Energy's commitment or otherwise to the Panel process. Without effective participation from Sakhalin Energy, the Task Force will fail.	Sakhalin Energy	None specified	
ITEM 12: 4-D SEISMIC SURVEY					
GWAP-5/004	Section 12.2	The Panel strongly urges that every effort be made to enable an [independent] observer to be present [onboard the seismic vessel during the survey].	Sakhalin Energy	None specified	
GWAP-5/005	Section 12.3.4	The Panel recommends that these tabulations [on non-systematic sightings] be available in time for inspection at the proposed Task Force workshop to be held at the end of January 2009.	Sakhalin Energy	End of January 2009	
GWAP-5/006	Section 12.3.5	Because the actual negative bias in distance estimates tends to be substantially more than can be accounted by refraction alone, the Panel recommends that an empirical distance bias correction be estimated from the comparison of vessel and shore-based sightings.	Sakhalin Energy	None specified	
GWAP-5/007	Section 12.3.5	The first step [in regard to GWAP-5/006] is to compile the sightings and determine sample size. The Panel requests that the compilation be available in time for the Task Force workshop scheduled for the end of January 2009.	Sakhalin Energy	End of January 2009	

Recommendation number	Cross-Reference	WGWAP Recommendation & Requests	Responsible Party	Target Completion Date	Sakhalin Energy Response
ITEM 13: OIL SPILL PREVENTION, PREPAREDNESS AND RESPONSE					
WGWAP-5/008	Section 13.2	The Panel requested to see Sakhalin Energy's NEBA (net environmental benefit assessment) documentation presented to the Russian authorities in support of the pre-approval application and Bell agreed to provide this.	Sakhalin Energy	End of January 2009	
ITEM 15: NON-SAKHALIN ENERGY GROUPS MONITORING					
WGWAP-5/009	Section 15	In addition to the outstanding tasks of the Photo-ID Task Force, the Panel recommends that Gailey carry out an analysis that compares the disturbance caused by boats of the IBM photo-ID team vs. the boat of the Russia-US team.	Sakhalin Energy	End of March 2009	
ITEM 17: UPDATE ON PROPOSED ACTIVITY ON THE SAKHALIN SHELF					
WGWAP-5/010	Section 17	... the Panel recommends that Sakhalin Energy work with relevant parties, including but not necessarily limited to Russian authorities and other oil and gas companies operating on the Sakhalin shelf, to jointly establish a western gray whale management plan.	Sakhalin Energy	None specified	
WGWAP-5/011	Section 17	The Panel further recommends that a moratorium be implemented on industrial activities, carried out by Sakhalin Energy and all other Sakhalin-based oil and gas companies, that might be expected, in the absence of <i>independently</i> verified mitigation measures (such as those developed by the Seismic Survey Task Force for seismic surveys), to disturb gray whales in and near their main feeding areas during the primary summer/autumn feeding season (July through October). This moratorium should remain in place until: (i) a satisfactory management plan is in place and (ii) the information flows required for its successful operation are functioning.	Sakhalin Energy	None specified	
WGWAP-5/012	Section 17	The Panel requests that Sakhalin Energy provide a realistic estimate of when it expects to complete the survey, and list the factors (other than the obvious ones such as ice and weather conditions) that could contribute to a delay, and that this information be submitted to the Seismic Survey Task Force workshop at the end of January 2009.	Sakhalin Energy	End of January 2009	
WGWAP-5/013	Section 17	Further, and also in the event that Sakhalin Energy is contractually committed to conduct the Astokh survey in 2009, the Panel requests that Sakhalin Energy obtain from the contractor information on whether it has scheduled further seismic surveys on the Sakhalin shelf in 2009 after the Sakhalin	Sakhalin Energy	None specified	

Recommendation number	Cross-Reference	WGWAP Recommendation & Requests	Responsible Party	Target Completion Date	Sakhalin Energy Response
		Energy survey, and permission to pass this information on to the Panel as soon as possible.			
ITEM 18: EXPLICIT DISCUSSION OF WGWAP MODUS OPERANDI, POTENTIAL REVISION OF ToR, STRUCTURE AND SCHEDULE OF PANEL MEETINGS					
WGWAP-5/014	Section 18	... the Panel urgently requests that government agencies and officials in Russia, IUCN, Sakhalin Energy, other companies active in all aspects of the oil and gas industry on the NE Sakhalin shelf, lending institutions, the Group for Strategic Planning on Western Gray Whales, non-governmental conservation organizations, and all other interested parties make a commitment to cooperate and collaborate with the Panel by providing the types of information and data as outlined above.	Various	None specified	

Annex 1. List of participants

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Annex 2. Final meeting agenda

1. Opening
 - 1.1. Introduction and logistics
 - 1.2. Adoption of agenda
 - 1.3. Documents
 - 1.4. Report drafting procedures
2. Review recommendations from previous meetings
3. Population assessment
 - 3.1. Progress on update of population assessment
 - 3.2. Analysis of data on body condition from Russia-US team
 - 3.3. Data on body condition incorporated into a population assessment
4. Conclusions and recommendations from the rangewide workshop
5. Preliminary results of 2008 WGW distribution and behavior monitoring
 - 5.1. Results from Sakhalin Energy/ENL shore and vessel survey program
 - 5.2. Results from observational effort by non-industry groups
6. Photo-ID
 - 6.1. Progress report from Photo-ID Task Force
 - 6.2. Photo-ID of WGWs in Sakhalin and Kamchatka
 - 6.3. Photo-ID of WGWs in Sakhalin
 - 6.4. Review the continuation and functioning of the Photo-ID TF
 - 6.5. Review of progress on comparison of Kamchatka photos to both the Russian and the Russian-US catalogues (per recommendation by IWC-SC)
7. MMO programme and carcass detection
 - 7.1. 2008 MMO programme preliminary report (refer to WGWAP-3/002 and /003)
 - 7.2. Update concerning annual revision of MMPP (specifically in relation to traffic management for current operations in Aniva Bay, and crew change vessels)
 - 7.3. Update on Sakhalin Energy authorization to collect tissue samples
 - 7.4. Update on necropsy manual (refer to WGWAP-4/003)
 - 7.5. Update on necropsy kit
8. Multivariate analysis
 - 8.1. MVA of 2006 data (taking recommendations WGWAP-4/006 and /007 into consideration)
 - 8.2. Final adoption of data availability protocol
 - 8.3. Update on progress with MVA-workshop(s)
9. Monitoring and management of continuous noise
 - 9.1. Further consideration of results from Sakhalin Energy's 2007 noise and whale monitoring programme – to include both noise and whale behaviour/distribution/density data (contingent on receipt of 2007 noise close-out report; per recommendation WGWAP-3/032)
 - 9.2. Documenting the evolution of Sakhalin Energy's noise management and mitigation programme – lessons learned – Draft manuscript for review by panel and Sakhalin Energy
 - 9.3. Review results of comparison of methodological approaches and observational data from the two shore-based teams

- 9.4. Progress on development and testing of digital real-time monitoring buoys
10. Benthic monitoring
 - 10.1. Preliminary 2008 benthic monitoring report
 - 10.2. Report from Environmental Monitoring Task Force
11. Satellite tagging
 - 11.1. Progress on recommendation on WGW satellite tagging
12. 4-D seismic survey
 - 12.1. Review status of WGW mitigation and monitoring to the extent this is possible in the absence of any new documentation or someone at the meeting to speak to this issue.
 - 12.2. Update on implementation of recommendations
 - 12.3. Update on completion of intersessional tasks:
 - 12.3.1. Real-time calibration
 - 12.3.2. Results of the JASCO modelling work
 - 12.3.3. Results of the 95% kernel analysis
 - 12.3.4. Results of analysis of inclusion of non-systematic sightings
 - 12.3.5. Revised maps and perimeter monitoring line
 - 12.3.6. Final coordinates for monitoring line
 - 12.3.7. ToR for seismic survey expert group
13. Oil spill prevention, preparedness and response
 - 13.1. Update on implementation of recommendations
 - 13.2. Update on completion of intersessional tasks
14. Future Sakhalin Energy plans for WGW monitoring and research
 - 14.1. Presentation by the panel on what is needed for an adequate Sakhalin Energy research and monitoring plan (based on pre-meeting work by panel and on WGWAP-4/INF. 19)
 - 14.2. Update on JIP proposal on CEE on gray whales
15. Non-Sakhalin Energy groups monitoring
 - 15.1. Russia-US Team
 - 15.2. WWF, IFAW
 - 15.3. Update on proposed Piltun Protected Area
16. Activity by other companies
17. Update on proposed activity on the Sakhalin Shelf.
18. Explicit discussion of WGWAP *modus operandi*, potential revision of ToR, structure and schedule of panel meetings.
19. Any other business.

Annex 3. List of documents

Document number	Title	STATUS	Notes
<i>Primary documents</i>			
WGWAP-5/1	Provisional agenda (English)	Public	
WGWAP-5/2	Provisional agenda (Russian)	Public	
WGWAP-5/3	List of documents distributed in connection with the 5 th meeting of the WGWAP	Public	
WGWAP-5/4	Updated table of recommendations from previous meetings	Public	
WGWAP-5/5	Conclusions and Recommendations from the rangewide workshop	Public	
WGWAP-5/6	Information on inshore movements of <i>Miss Sybil</i> during 2007	Confidential	
WGWAP-5/7	WGWAP-5 Time schedule	Public	
WGWAP-5/8	Towards a Conservation Plan for western gray whales	Public	Powerpoint presentation
WGWAP-5/9	Response of Russian Team to “Response to IUCN regarding Dr. Avilov’s modeling results”.	Public	
WGWAP-5/10	Tagging western gray whales: a quick overview of recent information	Public	Powerpoint presentation
WGWAP-5/11	Data availability protocol	Public	
WGWAP-5/12	ToR for seismic expert group	Public	
WGWAP-5/13	Progress report – Recommendations arising from Oil Spill related issues at WGWAP-3 and WGWAP-4	Public	
WGWAP-5/14	The seismic track SEL computation	Public	
WGWAP-5/15	Response to IUCN regarding Dr. Avilov’s modeling results	Confidential	
WGWAP-5/16	Considerations about acoustic propagation modelling in environments with solid substrates	Public	Powerpoint presentation
WGWAP-5/17	Report to LGL on Methods to Estimate the WGWPiltun Feeding Area Boundary and Number of Ensonified WGWs	Confidential	
WGWAP-5/18	Comparison of Shore-Based Scan Counts	Public	
WGWAP-5/19	Preliminary results of Russia-US team research off Sakhalin Island, 2008	Public	Powerpoint presentation
WGWAP-5/20	Estimation of acoustic levels and sound	Public	Powerpoint presentation

	energy exposure at locations of WGW sightings for input to the 2006 MVA study		
<i>For information documents</i>			
WGWAP-5/Inf.1	Seasonal and annual variation in body condition of western gray whales off north-eastern Sakhalin Island, Russia (IWC/SC/60/BRG16)	Public	
WGWAP-5/Inf.2	Population assessment of Western Gray Whales based on data from Piltun, Sakhalin Island (RW2008-12)	Public	
WGWAP-5/Inf.3	SEIC's 2008-2010 plans for WGW research and monitoring (WGWAP-4/INF.19)	Confidential	

Annex 4. Revised work plan for the Photo-ID Task Force

Background

The report of the Photo-ID Task Force presented at the WGWAP-3 meeting contained a number of consensus recommendations calling for the completion of additional work (WGWAP 3/INF.17). The Terms of Reference of the Task Force are given in Annex 4 of the report of WGWAP-3.

While the Task Force has yet to make concerted progress on these recommendations, the Panel and Sakhalin Energy consider it important not to lose momentum generated by the first Task Force meeting. Thus, at this meeting the Panel recommended that a work plan and time line be drafted and adopted to ensure that the aforementioned recommendations, on which there was consensus, are pursued in a timely manner.

The following work plan lists the recommendations made by the Photo-ID Task Force and proposes a time line for implementation and/or completion of each action item.

Work plan and time lines

(1) Update of the cross-matching of the catalogues

(a) Each team should send Finn Larsen at IUCN either of the following:

- (i) an updated catalogue covering field seasons up to and including 2007; or
- (ii) a supplement to the 2005 catalogue, containing new entries from 2006 and 2007, and any revisions to previous entries.

Time line. The Russia-US catalogue update was received in August 2008. The IBM update should be received by **28 February 2009**.

(b) Each team should attempt to match the new entries from the other team and report the results.

Time line. **31 March 2009**.

(2) Design and undertake a comparison exercise on a subset of the annual sighting histories

Time line.

(i) Proposal was prepared by Cooke and Donovan and circulated by Larsen in August 2008 to Task Force for comments.

(ii) Following comments received, Larsen circulated a final proposal to the Task Force in October 2008.

(iii) Data required to put terms of the proposal into practice should be sent by each team to Finn Larsen at IUCN by **28 February 2009**.

(iv) Results of comparison exercise to be circulated by **31 March 2009**.

(3) Protocols for ID-photos from dead animals and whale-watching vessels

(a) Advisory protocol to help ensure that identifiable photos are obtained from any dead whales found anywhere in the range.

(b) Protocol for obtaining ID-quality photos, for circulation to whale-watching vessels within the range.

Time line.

Draft protocols to be developed by Weller and circulated by Larsen to Task Force by **28 February 2009**. Further action to be discussed at the proposed Task Force meeting.

(4) Review the criteria for judging mother-calf pairs and, if appropriate, develop a scoring system (e.g. as used for southern right whales)

(5) Review the criteria for identifying unaccompanied calves and, if appropriate, develop revised criteria for use by each team

Time line. It makes sense to treat these two items together. A proposal should be elaborated by Cooke and Donovan when results of the comparison exercise under (2) are available. This should be circulated by Larsen to the Task Force by **15 March 2009**, provided the data requested under (2) have been received. Further action to be agreed at the proposed Task Force meeting

(6) Compare the criteria used by each team for recording body condition ('skinny whales') and agree on a coding system that would allow analyses of the combined datasets

Time line. Work on this task will await the availability of the major body condition analysis that is nearing completion by the Russia-US team. Based upon this analysis, Cooke and Donovan will develop an initial proposal to be circulated to the Task Force by Larsen by **28 February 2009**. Further action to be agreed at the proposed Task Force meeting.

(7) Draw up specifications for population analyses using the combined data (on annual sighting histories) and seek permission from the relevant parties to enable these to be conducted

Time line. Proposals for analysis to be elaborated were circulated to the Task Force by Larsen in November 2008. Comments were received from the Russia-US team. Comments from the IBM team to be received by **28 February 2009**. The analysis itself will occur after Items (4) and (5) have been completed. Further action to be discussed at the proposed Task Force meeting.

(8) Evaluate the potential for analyses using photo-ID and other data that could help measure the effects of anthropogenic disturbance on the whales

Time line. An initial analysis of the potential for this type of work based on the Russia-US time series should be conducted by Cooke and circulated by Larsen by **28 February 2009** to the Task Force for comment and further ideas. Cooke will incorporate these comments into a final Task Force proposal for further analyses using both datasets.

(9) Examine the extent of overlap in the research effort in time and space. This should initially be based on a broad graphical summary provided by each team of its hours of

photo-ID research effort by square and time period. Based on this, the need for a more extensive analysis can be assessed.

Time line. Cooke developed a template for data tabulation which was circulated to the Task Force by Larsen in October 2008. The required data have been supplied by the Russia-US team. Data from the IBM team are requested by **28 February 2009**. An analysis of the overlap will be prepared by Cooke and circulated by Larsen by **31 March 2009**.

Data safeguards

To ensure that IUCN retains an overview of the collaboration between the teams, material should be exchanged by sending it to Finn Larsen at IUCN, for forwarding to those appointed to perform the corresponding analysis.

All data exchanged between the teams shall be treated as strictly confidential, unless or until they have been published by the submitting team. No confidential data may be included in a Task Force report or other public document without agreement of the submitting team.

Confidential data shall be used only for conducting analyses agreed to by the entire Task Force. Any results of analyses remain confidential within the Task Force until the Task Force agrees what to do with them.

Annex 5. Terms of Reference for the Expert Group to Refine the Monitoring Plan for the 2009 Astokh 4-D Seismic Survey

1. BACKGROUND

Based on the report of the Seismic Survey Task Force², the WGWAP at its 4th meeting³ agreed the following:

The Panel noted that one of the major difficulties faced by the Task Force in assessing the risk to western gray whales from seismic surveys (and indeed any anthropogenic noise) was the shortage of applicable data on effects of sound on baleen whales. Given that regular (4-5 year intervals) seismic surveys are expected for the lifetime of the field, the Panel **agreed** with the Task Force that it is essential that every effort be made to ensure that the WGWAP (or any other body) does not find itself in the same position the next time a seismic survey is proposed. It is thus of great importance that a sufficient monitoring effort is in place to maximise the collection of relevant data to allow a better analysis of the problem and thus develop more effective mitigation measures for the future.

The Panel noted that the Task Force had neither the time nor the necessary analytical expertise available to develop a detailed monitoring plan (that included in WGWAP 4/INF.15 and repeated in Annex 7 represents an outline). It **concurs** with the Task Force that a suitable group of experts should be asked to work with Sakhalin Energy scientists to develop a fully specified field plan and proposed analysis, well before the final plans for monitoring in 2009 are completed. There was insufficient time at the present meeting to develop a detailed Terms of Reference or to finalise the composition of such a group. The Panel therefore **agreed** that Donovan, Bell, Cooke, Gailey, Nowacek and Weller should work to develop draft Terms of Reference and suggested participants for this expert group, for circulation to the Panel by 1 September 2008.

2. OBJECTIVES

The general objective of this expert group is to finalise a fully specified field plan and proposed analysis, well before the final plans for monitoring in 2009 are completed in order to ensure that sufficient monitoring effort is in place to maximise the collection of relevant data to allow a better analysis of the problems surrounding gray whales and seismic surveys and thus develop more effective mitigation measures for the future. The broad outline of the monitoring effort, especially with respect to resources (personnel numbers, equipment etc.), is included in the report of the Seismic Survey Task Force and repeated as Annex 7 of the 4th report of the WGWAP. Thus the primary focus of the expert group is to finalise the *details* of the monitoring efforts to be undertaken in association with the 2009 Astokh 4-D seismic survey.

3. PARTICIPANTS

In addition to Donovan, Bell, Cooke, Gailey, Nowacek and Weller, the expert group needs to at least include participants with the following expertise:

(1) representatives of Sakhalin Energy who will be leading the monitoring programmes associated with the 2009 survey *i.e.*

- Acoustic monitoring
- Abundance/Distributional monitoring

² http://cms.iucn.org/wgwap/meetings/task_forces/4_d_seismic_task_force/index.cfm

³ http://cms.iucn.org/wgwap/meetings/meeting_4/index.cfm

- Behavioural monitoring

(2) outside experts with practical experience in (1) the collection and (2) the analysis of acoustic, distributional and behavioural monitoring data. In terms of analysts, this needs to include experts with experience in integrated analysis not simply the individual topics.

4. MODUS OPERANDII

A 3-day workshop will be held in Vancouver, 31 January – 2 February 2009. At a minimum, the participants should receive the latest plans developed by Sakhalin Energy as soon as possible, and the results of the tasks identified under 12.3.4 and 12.3.5 of this report. The steering group (Donovan, Bell, Cooke, Gailey, Nowacek and Weller) will develop a draft agenda. Invitations have been issued to those experts nominated by the steering group.