

**WESTERN GRAY WHALE ADVISORY PANEL**  
**6<sup>th</sup> Meeting**

**WGWAP-6**  
**21-24 April 2009**  
**Geneva, Switzerland**

**REPORT OF THE WESTERN GRAY WHALE ADVISORY PANEL**  
**AT ITS SIXTH MEETING**

**CONVENED BY THE INTERNATIONAL UNION FOR CONSERVATION OF NATURE**

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**1 OPENING**

The sixth meeting of the Western Gray Whale Advisory Panel (WGWAP-6) was held at Hotel Epsom, Geneva, Switzerland, from 21-24 April 2009 under the chairmanship of R.R. Reeves.

One panel member, Doug Nowacek, was unable to attend the meeting because of a prior fieldwork commitment. Brandon Southall, an associate researcher from the University of California, Santa Cruz, participated in the first two days of the meeting as an Associate Scientist to provide technical support in Nowacek’s absence. Amanda Bradford of the University of Washington (Seattle) attended the meeting of the Photo-ID Task Force for two days immediately before WGWAP-6 and, at the request of the Panel, stayed on to provide technical support during the main meeting. Panel members present are listed in Annex 1. The meeting was also attended by representatives of the following organizations (also see Annex 1):

AEA Group	Pacific Environment
Credit Suisse	Sakhalin Energy Investment Company Ltd
International Union for Conservation of Nature (IUCN)	Shell International
Mizuho Corporate Bank, Ltd.	Stephen Turner, consultant to IUCN for evaluation of WGWAP
Ministry of Natural Resources and Environment of Russian Federation	WWF International
	WWF Russia

Finn Larsen and Laura Riddering of IUCN facilitated meeting preparations and logistics. Sarah Humphrey and Laura Riddering served as meeting rapporteurs. Their efforts in support of the Panel’s work are greatly appreciated.

**1.1 Introduction and logistics**

In his introductory remarks, Reeves recalled the Panel’s expressions of disappointment and discontent regarding Sakhalin Energy’s lack of responsiveness between WGWAP-4 and WGWAP-5 (see report of WGWAP-5; <http://www.iucn.org/wgwap/index.cfm>). He acknowledged, however, that in the months since the December 2008 meeting (WGWAP-5), there has been a welcome change. Communications and responsiveness have greatly improved, and Sakhalin Energy officials have made clear that the company remains committed to the WGWAP process. In terms of communications with IUCN and the delivery of documents and data for this meeting and for inter-sessional work of the task forces, the company has largely met its commitments and done so in timely fashion. On the part of the Panel, some members, due to their extremely heavy workloads arising from other professional responsibilities, were unable to deliver documents on time for WGWAP-6. However, this should in no way be interpreted as a sign of lack of commitment to the process on the panellists’ part.

Hake spoke briefly on behalf of Sakhalin Energy and reiterated the company’s appreciation of the WGWAP process and its intention to continue to engage constructively.

During the introductory session, comments by observers indicated that a number of statements in the report of WGWAP-5, including the Panel’s recommendation of a ‘moratorium’ on industrial activities on the north-eastern Sakhalin Shelf (WGWAP-5/011), had been subject to varying interpretations. Given this, it is appropriate to repeat and clarify several things at the outset of the present report. The Panel’s operative recommendation

from WGWAP-5 was ‘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)’ (WGWAP 5/011). It was on that basis that the Panel had continued its longstanding engagement with the company in the work of the Seismic Survey Task Force, which met for the third time in January 2009 (approximately six weeks after WGWAP-5) with the intention of working out specific mitigation measures and final details for the monitoring programme. In other words, the Panel had not intended for the recommended moratorium to apply to the proposed 2009 Astokh seismic survey as long as a suitable mitigation and monitoring programme was in place.

At the same time, however, in the same section of its report from WGWAP-5, the Panel had taken note of the preliminary information presented on gray whale numbers and distribution off Sakhalin in 2008. That information ‘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’ and ‘this scarcity may have been related to underwater noise produced during onshore pile-driving activities undertaken by ENL on the northern Piltun barrier spit adjacent to the Odoptu block’. Therefore, the Panel had concluded the following: ‘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’ (report of WGWAP-5, item 17).

In other words, taken as a whole, the report from WGWAP-5 was intended to stress the Panel’s serious concern that the pattern of whale distribution, movement and habitat use in 2008 may have represented a response to acute and/or cumulative anthropogenic disturbance on the Sakhalin Shelf, and the Panel anticipated that the data and information provided at this meeting (WGWAP-6) would help clarify the seriousness of that concern. Moreover, the Panel had every intention of continuing to work with the company during and after this meeting to develop and implement a suitably precautionary mitigation and monitoring plan for the proposed 2009 seismic survey.

## **1.2 Adoption of agenda**

The agenda (Annex 2) had been prepared by Reeves and Larsen, with input from Sakhalin Energy representatives, Panel members and observers. Although it was necessary to adjust the timing of some items, the basic structure of the provisional agenda was adopted with no major change.

## **1.3 Documents**

The list of documents, including PowerPoint presentations in some instances, is given in Annex 3. As indicated above, the documents from Sakhalin Energy had been provided in a timely fashion while several from the Panel were late.

## 1.4 Reporting Procedures

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

## 2 4-D SEISMIC SURVEY

### 2.1 Update on survey plans

Sakhalin Energy explained that a contract had been drawn up for JSC 'DALMORNEFTEGEOPHYSICA' (DMNG) to conduct the survey, with technical assistance from PGS of Norway. The draft contract contained a preliminary version of the EIA, which included all mitigation measures and monitoring elements recommended by WGWAP-4. The contractor would be required to implement these measures to the letter. The planned starting date of seismic data acquisition was 20 June. It was considered uneconomic to contract the vessel for an earlier start date, in case ice were to prevent data acquisition, causing idle time for the vessel.

The minimum time to complete the survey was estimated as 5 days. However, given that some lines likely would need to be repeated ('infill'), 7 days of survey was considered a more realistic total time required. Delays due to ice, weather or mitigation measures (shut-down rules) could further extend the duration of the survey. It was anticipated that the *Akademik Oparin* would be on site to deploy the monitoring buoys from 15 June.

An application for approval from the Russian authorities had been submitted in February 2009 and was expected to be completed by May 2009. Because DMNG has 'blanket approval' to conduct seismic surveys on the Sakhalin Shelf until 2015, Sakhalin Energy was of the view that specific approval for the Astokh 4-D survey was not needed, nor did the company consider that its EIA needed to be submitted to or approved by the Russian authorities. A different view was expressed by several observers, who stated that (a) the existing DMNG approval still required a positive outcome from a State Ecological Expertiza for this specific survey and (b) the Sakhalin Energy 4D seismic EIA had never been presented publicly in spite of World Bank guidelines that consider public review an integral part of the EIA process. As he had done at WGWAP-5 (see WGWAP-5 report, Item 12.1), Hancox re-stated the lenders' position that if a survey were to go ahead, they would expect to be given an opportunity to review the Sakhalin Energy EIA (as per World Bank and International Finance Corporation guidelines), regardless of whether such review is legally required.

Given that this was to be a repeat of the 1997 survey, Sakhalin Energy reiterated that it would be necessary to use the same locations of sources and receivers to the extent this is possible. The Panel had previously expressed concern that this might be interpreted to mean that the same survey would have to be repeated many times over 40 or so years of the lifetime of the Sakhalin II project, and it had recommended reducing the level of energy from the gun volumes and increasing the numbers of streamers to compensate.

Sakhalin Energy again explained that there were technical and commercial reasons why this was not possible. More streamers would change the azimuth and offset between traces. The effects that are being assessed by the survey are very subtle and of the same order of magnitude as would occur with more streamers. Sakhalin Energy reported that it had evaluated the option for an 8-streamer vessel and found that this would have doubled the

cost. The company reminded the Panel that it had addressed the subject of decreasing source energy and that a white paper on this had been discussed previously. It further noted, however, that Shell-US had conducted tests on reducing sources and modifying source directionality but the results were not yet available. Based on the results, it may prove feasible to apply improved technologies in a repeat survey planned for 2012.

A further concern expressed by the Panel was that the same seismic vessel might conduct additional surveys for other operators in the region immediately after completion of the Astokh 4-D survey. Sakhalin Energy representatives explained that their company's contract with the seismic operator was not explicitly dependent on the vessel finding other work in the Sakhalin area after the Sakhalin Energy survey. In fact, they considered it likely that the vessel would conduct further surveys on the Sakhalin Shelf but unlikely that any of those other surveys would occur close enough to the Piltun-Astokh area to significantly affect the whales there.

## **2.2 Review of status of gray whale mitigation and monitoring plans**

The Panel had recommended at WGWAP-4 that the mitigation plans proposed by the Seismic Survey Task Force at its second workshop (Lausanne, March 2008) be adopted.

In accordance with a recommendation made by the Panel at WGWAP-5, a third workshop of the Task Force was held in Vancouver at the end of January 2009. This workshop expanded on the mitigation and monitoring plans contained in the report of the March 2008 Task Force workshop, with a principal focus on further developing and designing the monitoring aspects of the programme. A number of outside experts participated along with Panel members and Sakhalin Energy representatives. Donovan (who chaired the workshop) apologised for the fact that the report had not yet been finalised and in the absence of a final report, he provided a verbal summary of the agreed recommendations.

A major aim of the monitoring programme is to collect data that can be used to assess the effects of the survey on the western gray whale population and thus help guide future policy choices regarding repeat surveys, which technology to employ etc. Ultimately, effects on reproduction and survivorship are of greatest concern, but potential intermediate indicators of demographic effects include changes in time spent feeding, shifts in feeding area and stress-responsive behaviour. Power analyses conducted at the workshop showed that the proposed monitoring programme should, in principle, be capable of detecting changes in whale behaviour and distribution.

The workshop recommended two additional analyses needed to finalise the Perimeter Monitoring Line (PML), as follows:

(1) Investigation of the use of opportunistic (*i.e.* non-systematic) sightings to improve density estimates in and near the area of the seismic survey. This was primarily intended to help overcome the limitation of the previous analyses, which had ascribed zero density to areas with no systematic observation effort that were primarily beyond the range of shore-based observers. Following the Vancouver workshop, IUCN contracted Dr Charles Paxton at the Centre for Research into Ecological and Environmental Modelling (CREEM), St Andrews University, to perform the analysis. His results were not yet available at WGWAP-6.

(2) Correction of the shore-based distance data for refraction. The Task Force recognised that, while it is better to make this correction than not to do so, there appears to be considerable additional negative bias in the shore-based distance estimates that cannot be accounted for by correcting solely for refraction effects.

With respect to item (2), Muir presented a recalculation of the PML after incorporating the refraction correction. The correction made a large difference to the results, increasing the expected number of A-lines from 5 to 11.

The A-lines are the seismic survey lines for which special mitigation measures apply because they are near enough to ensonify the near-shore (Piltun) feeding area. Broker estimated that the additional A-lines could increase the overall survey time by about 50% because of the agreed restrictions on surveying the A-lines. Both the Panel and Sakhalin Energy recognised that extending the survey time would be counter to the primary mitigation strategy of completing the survey as early in the season as possible when fewer whales would be expected to be present.

It was noted that the large change (from 5 to 11 A-lines) was due to the inclusion of the refraction correction that increased distances of shore-based distribution team sightings that form a substantial portion of density estimates. Both calculations (with and without the refraction correction) used an identical grid. The kernel density analysis methods were also identical. The Panel had a number of concerns about the analysis, most of which had been expressed on earlier occasions. The gridded nature of the analysis can mean that the influence of an individual sighting strongly depends on the grid cell into which that sighting falls. The treatment of cells with zero effort as cells of zero density remains a concern, as does the exclusion of sightings at zero reticles.

In view of the recommendation to postpone the survey (see later), the Panel did not try to reach a final decision on the PML at this meeting. The matter was referred to the new work plan of the Seismic Survey Task Force, which will include consideration of the opportunistic sightings data (see later).

The Task Force made a number of additional specific recommendations regarding monitoring, at least some of which had already been followed by Sakhalin Energy since the January 2009 workshop. In view of the non-availability of the Task Force workshop report at the time of WGWAP-6, and the Panel's recommendation to postpone the seismic survey to 2010 (for other reasons, as discussed below under Items 2.3 and 6.5), the Panel decided to defer final consideration of the outstanding Task Force recommendations until WGWAP-7, when the report of the Vancouver workshop and an update from the Task Force on further progress would be available.

### **2.3 Panel discussion and recommendations**

The Panel had been asked by Sakhalin Energy to finalise its discussions and provide its advice on the 2009 seismic survey by the end of the meeting, rather than 2-3 weeks after the panel meeting as is usual. This request arose from the need for the company to (1) finalise contractual arrangements and (2) complete any additional arrangements arising from the Panel's discussion of the work of the Seismic Survey Task Force, in order to allow the survey to commence on 20 June. The Panel agreed to this request, recognising the need for timely advice.

In reaching its view, the Panel took into account the following factors:

- (1) the extensive work of the Seismic Survey Task Force and associated discussions within the Panel over the past two years;
- (2) the considerably greater amount of information on distribution and numbers of western gray whales off Sakhalin in 2008, and on the activities of companies other than Sakhalin Energy in 2008, than had been available at WGWAP-5 (*e.g.* see Items 5 and 6, below); and



(3) the new information on the activities of companies other than Sakhalin Energy predicted or planned for 2009 (see Item 14).

These three factors are discussed more fully in the following paragraphs.

*(1) Seismic Survey Task Force*

The work of the Seismic Survey Task Force over the past two years has been extensive and represents a considerable investment of time and resources by both Sakhalin Energy and the Panel. An extremely difficult task has been accomplished in a thorough and co-operative manner. The Panel believes that the final product, once all of the recommendations have been incorporated, will represent an exemplary approach to the monitoring and mitigation of seismic surveys in this region (and indeed an approach that should be followed elsewhere in the world). Under normal circumstances the Panel would have agreed that the proposed Sakhalin Energy survey could take place given that all of the recommendations (including the PML location) are finalised and followed.

*(2) Distribution and numbers of western gray whales present in the Sakhalin near-shore (Piltun) feeding area in 2008*

Preliminary information on the distribution and numbers of western gray whales in the Sakhalin near-shore feeding area in 2008 had given the Panel cause for concern at its last meeting (see WGWAP-5 report). At the present meeting, the Panel had available considerable information including: the extensive 2008 close-out reports from Sakhalin Energy on distribution, behaviour, photo-identification, acoustics and benthic monitoring; information on distribution and photo-identification studies in 2008 by the Russia-US team; and information from a variety of sources on the activities of companies other than Sakhalin Energy in 2008.

There is no reason to doubt that the distribution and numbers of western gray whales in the near-shore feeding and nursery area in 2008 were greatly different from what had been observed in previous years (1997-2007). Occurrence in 2008 was spatially restricted and the number of whales present was lower. The good information on benthic resources provided in this year's close-out report did not show any significant difference from recent years (see Item 5.5, below). As discussed later under Items 5 and 6.5, the Panel considered a number of hypotheses that might explain the changes in distribution and numbers, and some of these hypotheses, if true, would raise considerable concern over the status of this critically endangered whale population. The available information did not allow the Panel to distinguish among the hypotheses, some of which refer primarily to anthropogenic activity in the region in 2008 by companies other than Sakhalin Energy.

*(3) New information on the activities of companies other than Sakhalin Energy predicted or planned for 2009*

For many years, the Panel (and its predecessors) have expressed concern about the lack of reliable and complete information on the activities of companies other than Sakhalin Energy in the region. This concern remains and recommendations for dealing with it are given under Item 14. This year the Panel had before it information suggesting that there could be considerable activity in 2009 with potential for affecting gray whales on their near-shore feeding and nursery area, including more pile-driving and seismic surveys in the region.

All three of these factors were relevant to the Panel's full and careful deliberations on the planned 2009 SEIC seismic survey.

As summarised above, the Panel believes that the extensive work of the Seismic Survey Task Force has been leading towards what could become an exemplary mitigation and monitoring plan; in the absence of the troubling information on whale distribution and behaviour in 2008, the Panel would have had little hesitation in giving advice that, provided all of its recommendations were followed, the 2009 seismic survey could proceed. However, under the circumstances, the Panel felt compelled to offer the following advice.

The Panel **reiterates its previous recommendation** regarding a moratorium on all activities by all companies that could adversely affect western gray whales. It is extremely concerned with the information on the activities planned by other companies for 2009. Despite the extensive progress made on developing a risk-averse mitigation and monitoring plan, the Panel **concludes** that the moratorium should include Sakhalin Energy's seismic survey and **recommends** that the survey be postponed, pending the results of a full programme to monitor the distribution and abundance of whales in 2009 (see Item 12.2, below). Should those results reduce the uncertainty and allay much of its concern arising from the observations in 2008, the Panel may be in a position to reconsider the idea of a seismic survey in 2010. Recognizing that possibility, the Panel **recommends** that sufficient advance planning be made in all aspects of monitoring and mitigation before, during and after the survey to ensure both minimisation of impact and collection of pertinent data.

The Panel wishes to stress that this recommendation is in no way a reflection of dissatisfaction with the work of the Seismic Survey Task Force or with the degree of co-operation given to the Panel by Sakhalin Energy. The recommendation is driven by the Panel's primary concern, which is the survival and recovery of the western gray whale population. Given the uncertainty surrounding the situation in 2008, the Panel believes that its advice represents a practical implementation of the precautionary principle. It recognises that, unfortunately, the company that is acting responsibly by providing information and co-operating in this international initiative may be the only one to follow the Panel's advice on the moratorium. The Panel **reiterates** its request that all companies involved in the development of oil and gas resources on the northeastern Sakhalin Shelf join in this international effort and abide by the call for a moratorium on potentially harmful activities until the status of the whale population has been clarified. The Panel specifically **urges** the Russian Federation to assist in this process.

In the event that Sakhalin Energy decides to work towards conducting the seismic survey in 2010 or later, the Panel **recommends** that the Seismic Survey Task Force be reconstituted and reactivated well in advance so that it has sufficient time to complete the outstanding items identified in a work plan to be prepared following this meeting. Reeves will liaise during the coming months with Sakhalin Energy and IUCN to decide on procedures and timing. The Panel stresses the importance of ensuring that enough time is set aside to complete necessary analyses and related discussions and that last-minute, high-pressure, improvised planning is avoided.

#### **2.4 Sakhalin Energy response**

Bell responded on behalf of Sakhalin Energy. He noted that the company accepted the Panel's recommendation to postpone the survey, but that from the company's point of view it would have been safe to proceed in 2009 provided that the mitigation and monitoring plan previously agreed with the WGWAP was fully implemented. Cognisant of the Panel's recommendation, Sakhalin Energy has decided to comply with the recommendation and to postpone the survey until 2010. The company anticipates further discussions with the Panel on this matter in coming months.

Beyond his formal statement on this recommendation, Bell expressed his belief that the WGWAP process is a good one and that it should continue.

### **3 PROGRESS ON PLANS FOR SATELLITE TAGGING**

Weller outlined progress on planning for a satellite tagging programme on western gray whales. The overarching objective is to determine the migration routes and identify the wintering grounds of the population. Previous recommendations by the WGWAP and IWC Scientific Committee included that: 1) only experienced researchers carry out the work using proven methods first tested on eastern gray whales, 2) individual whales be identified visually prior to tagging, 3) tagging skinny whales be avoided and 4) tags be deployed only on known males, taking into account individuals with rare and common haplotypes. With regard to oversight of a tagging programme, the IWC Scientific Committee had recommended that it act as a coordinator for a tagging/telemetry project to ensure, among other things, that such a project is carried out in a risk-averse manner (IWC, 2008). Finally, a coordination group was established to provide scientific guidance and ensure consistency between the Scientific Committee's recommendations and those of the WGWAP. This guidance would include specific advice on experimental protocols, study design and measures to be taken to minimise the risks of negative impacts on individual whales and on the population as a whole.

A proposed timeline for the tagging programme was as follows:

- January - April 2009
  - Review of information and discussions
- April - May 2009
  - Development of tagging study framework by coordination group
- June 2009
  - Review of study framework by IWC Scientific Committee
- June 2009
  - Initiate planning for 2010 field programme
- November 2009
  - Review progress at WGWAP-7 (taking into account feedback from IWC Scientific Committee)
- Summer/Autumn 2010
  - Fieldwork and tracking

In light of the above recommendations and advice, two tables providing summary information on the performance of barnacle tags (on a variety of species including one eastern gray whale) as well as implantable tags (used on eastern gray whales) were presented and discussed. Information in these tables demonstrated that the only tag presently meeting the aforementioned criterion of 'proven methods first tested on eastern gray whales' is the implantable tag (as used by Mate and Urbán 2006). This being said, meeting participants highlighted the apparent potential of barnacle tags as well as other emerging technologies and noted that such tags, once tested on eastern gray whales, may prove to be effective. In discussion, some participants suggested that it might be better to postpone the tagging study until barnacle tags or other designs could be tested on eastern

gray whales. The Panel agreed that, in principle, it would like to see further research and development of alternative tags but not at the expense of delaying the tagging of western gray whales. Since gaining knowledge of their migratory routes and wintering grounds (as well as learning more about their movements within the Sea of Okhotsk) is vital to their conservation, Reeves stressed that the Panel considers the tagging work to be urgent and that 2010 is already later than ideal.

Prior to WGWAP-6, members of the Russia-US research programme had conducted an analysis that combined genetic information (sex determinations, haplotype designations and paternity assignments) with individual occurrence patterns and 'ease of real-time visual recognition' to rank the whales as candidates for tagging. This exercise would have benefited from incorporation of the IBM photo-identification data, with an ultimate objective to plot precisely on a map where males have been located in the feeding areas. The Panel endorsed this line of thought and **recommends** that such a joint analysis be undertaken.

Weller was asked whether western gray whales off Kamchatka should be tagged as well in the hope of obtaining a broader picture of the population's overall movements and distribution. Weller pointed out that this had been discussed in some detail by a small group at the Tokyo rangewide workshop and that that group had agreed that the priority for the present should be to tag known whales (males only) off Sakhalin to determine their migration route(s) and winter destination(s). Finally, Weller was asked whether there had been any discussion of using archival acoustic tags to gain insights about received levels of sound and, in turn, responsive changes in behaviour. Weller stated that the use of acoustic tags had been discussed by the Panel at previous meetings but that such a research endeavour, while valuable, fell outside of the primary and immediate objective of using long-lasting satellite tags to elucidate migration and wintering areas.

#### **4 REPORT ON PROGRESS AND PLANNING BY THE ENVIRONMENTAL MONITORING TASK FORCE**

VanBlaricom provided an overview of planned tasks to be undertaken by the Environmental Monitoring Task Force (EMTF). He qualified the presentation by noting that, at the time of the meeting, he and other panel members of the task force had not yet consulted with Sakhalin Energy members to get their input to planning. Therefore, the plan as proposed was provisional, subject to revision based on such consultation. Members of the EMTF from the Panel are VanBlaricom (Chair), Dicks, Tsidulko and Weller; those from Sakhalin Energy are Broker, Efremov and Fadeev.

The EMTF plans to focus on three tasks:

*1. Literature survey* – The primary goal of this task is to compile, review and synthesise the literature on ecosystems of the northeastern Sakhalin Shelf region including Piltun Lagoon. It was anticipated that relevant literature would be mainly in Russian, Japanese and English. Little progress had been made on this task thus far but VanBlaricom stated his intention to pursue it aggressively in the period before the next WGWAP meeting. Fadeev and Broker gave assurances that they were prepared to facilitate Panel access to relevant literature.

*2. Site visit, Sakhalin II Project Area* – VanBlaricom and other EMTF members will visit the Sakhalin II Project Area during the summer or early autumn 2009. Provisional dates for the visit are 1-10 September. Tsidulko expects to be on-site for fieldwork and thus able to provide assistance and support of certain kinds. Sakhalin Energy will assist with logistics,

including facilitation of transportation on Sakhalin Island. The provisional dates may be modified in deference to competing obligations of Tsidulko and other EMTF members.

There are three main goals for the site visit. The first is to gain a general overview of the project area and associated biological habitats, both from shoreline points and, if feasible, helicopter. It was recognized that a helicopter tour would require support from Sakhalin Energy, is inherently costly and would involve safety considerations associated with rotary-winged aircraft travel. It was agreed that the helicopter tour would be a provisional component of the site visit subject to additional discussion between VanBlaricom and Sakhalin Energy representatives. The second goal of the site visit is to conduct diving observations of the benthos, providing EMTF members with additional insights on the habitat and the potential interactions between the Sakhalin II project and the ecosystem. It was recognized that diving could be problematic from Sakhalin Energy's perspective in view of company protocols and the safety considerations generally associated with research diving in remote locations. This aspect requires further discussion and detailed planning. The third goal is for Dicks, and possibly other EMTF members, to carry out an inspection of oil spill containment facilities and stockpiles of equipment and supplies for oil spill response in the project area (see Item 10). (In discussions subsequent to the meeting session on this topic, it was determined that this proposed site visit might be more effective as a separate activity not linked to the early September site visit.)

*3. Site visit, laboratories of the Academy of Sciences of Russia, Vladivostok* - VanBlaricom and possibly other EMTF members will visit the laboratories of Fadeev and colleagues at the Academy of Sciences facilities in Vladivostok. The purpose is to allow EMTF members to observe methods relating to laboratory processing of samples from benthic ecosystem surveys conducted during the summer and autumn in the Sakhalin II project area, and to observe and discuss methods for management and synthesis of data resulting from the benthic sampling. Given competing obligations of the likely participants, it was generally agreed that the visit would be most effective as a second trip, separate from that to Sakhalin. VanBlaricom raised the possibility of recruiting a colleague from the University of Washington who is conversant in quantitative methods for data analysis, and is fluent in English and Russian, to participate in the site visit. There was discussion regarding possible budgetary constraints on the proposed visit to Vladivostok, but information subsequently provided by Larsen indicated that the activity likely could be accommodated with current funding. Informal discussion between VanBlaricom, Fadeev and Tsidulko indicated support for the proposed visit from Fadeev, and agreement that preferred timing of the visit would be approximately mid-November 2009. Dates were to be finalised through post-meeting discussions involving VanBlaricom, Fadeev and Bröker.

VanBlaricom suggested that a dedicated session of the EMTF be held at WGWAP-7 but acknowledged that Sakhalin Energy had not yet had the opportunity to comment on such a proposed session.

Bell confirmed that Sakhalin Energy welcomed the overall EMTF initiative and was prepared to host the proposed site visit to the Sakhalin II Project Area, and that the proposed timing was generally acceptable from the company's perspective.

## **5 RESULTS OF 2008 DISTRIBUTION, BEHAVIOUR, NOISE AND BENTHIC MONITORING**

### **5.1 Results from Sakhalin Energy/ENL distribution monitoring programme**

Document WGWAP-6/14, the final report from Sakhalin Energy of the 2008 distribution monitoring programme, was presented by Vladimirov who provided an overview of distribution patterns and relative numbers of whales in the Sakhalin near-shore and offshore feeding areas as well as some ancillary information collected from south-eastern Kamchatka in 2008. In some instances, the data collected from 2008 were compared to data from previous years. Of particular interest and concern to the Panel was the observed change in distribution and numbers of whales in the near-shore feeding area. The change indicated by the 2008 distribution data was consistent with that contained in reports from the photo-identification (WGWAP-6/5) and behaviour monitoring (WGWAP-6/13) teams. In brief, the distribution of whales in 2008 varied considerably from that in previous years with monitoring, especially with regard to the nearly total absence of whales in the most northern portion of the Sakhalin near-shore study area. Moreover, the total number of whales occupying the near-shore area decreased by nearly 40% in comparison to 2007, while the number of whales using the offshore feeding area more than doubled.

Although the Panel welcomed the data provided in WGWAP-6/14, it was disappointed by the numerous unsupported assumptions and conclusions expressed by Vladimirov during the course of the presentation. In particular, his conclusion that changes in distribution and numbers of whales in the near-shore and offshore feeding areas in 2008 were the result of changes in the availability of benthic prey, especially sand lance, was highlighted by the Panel as being unsupported by the results reported in the benthic monitoring report (WGWAP-6/12; see the detailed discussion of this topic under Item 5.5). Further, the Panel stressed that Vladimirov's assumption that the Sakhalin 'offshore' area and the areas where western gray whales have been observed off Kamchatka provide feeding habitat of equivalent quality to that of the near-shore (Piltun) area off Sakhalin has yet to be proven.

The presentation of WGWAP-6/14 generally dismissed the notion that anthropogenic noise may have affected the patterns of distribution and whale numbers observed in 2008. However, the Panel noted with interest and concern that the rapid decline in the relative abundance of whales in the Sakhalin near-shore feeding area during September 2008 (see Fig. 8 of WGWAP-6/14) was temporally coincident with the onset of two different types of relatively loud industrial activity in the region, namely the 2008 Elvay seismic survey and on-land pile driving at the ENL Odoptu site. As discussed below in more detail and within the context of noise monitoring (see Item 5.4), a seismic survey was underway to the north of the Piltun feeding area beginning in early September 2008 (details on timing and location unavailable). Airgun sounds from this survey were clearly detected by the Sakhalin Energy 'control' station (#14), which was the only acoustic recorder in the general area operating at that time. It appears that the onset of these strong acoustic signals in the northern edge of the near-shore feeding area was just prior to the observed general decline in relative abundance of whales (see Fig. 8 of WGWAP-6/14). Although it was not possible, with the lack of specific information available regarding the survey, to determine the exact received levels of these sounds within the feeding area because there was just one active recording buoy in the area, they were at least loud enough to overload (or 'clip') the recordings from this hydrophone at a level of 124 dB re 1 $\mu$ Pa for several days preceding (beginning 7 September) and many days following the observed decline of gray whales in the area. With sufficient information from other hydrophones that were not clipped and from transmission loss studies made in the area, some estimates of received sound levels from this seismic

survey could be made.

In addition, onshore pile driving associated with construction activities at the ENL Odoptu site reportedly occurred until 4 July, then stopped and resumed from 10 September onward in areas adjacent to the Piltun feeding area. Unfortunately, as is true for the aforementioned seismic pulses recorded in September, only limited information was available to the Panel for assessing the levels of exposure to pile-driving noise experienced by whales in the feeding area and thus evaluating how such exposure may have influenced the whales' behaviour and movements. However, acoustic monitoring stations near the construction site measured broadband signals, seemingly of anthropogenic origin, that exceeded 140 dB re 1 $\mu$ Pa on 10 September as well as other apparently impulsive signals for many days thereafter. It was difficult for the Panel to determine from the spectrograms provided whether these sounds were associated with seismic, pile driving, or other anthropogenic sound sources (such as vessels); finer spectral and temporal resolution and more information about the timing and location of surrounding activities would be required to do so. To determine whether some of the sounds were from nearby vessel operations (such as the AUAR deployments from the *Academik Oparin* or other ships; see 5.4 below), Sakhalin Energy would need to provide additional information regarding the movement of ships around the POI receivers during this period.

The Panel views the apparent closeness in time and space between the aforementioned industrial noise inputs and the observed changes in whale distribution and numbers as suggestive of a causal link. For a synthesis of the Panel's interpretation, see Item 6.5.

## **5.2 Results from observational effort by non-industry groups**

The results of observations on gray whale numbers and distribution by the Russia-US research team in 2008 had been reported at WGWAP-5 and no new information was presented at this meeting.

## **5.3 Results from Sakhalin Energy/ENL whale behaviour monitoring programme**

Gailey presented a summary of data collected by the Sakhalin Energy behaviour monitoring programme in 2008 (WGWAP-6/13). This included data on the following: (1) surfacing, diving and respiration patterns, (2) theodolite-derived movement patterns, (3) scan-based relative abundance and distribution and (4) shore-based photo-identification. Data from 2008 were compared, in some cases, with data collected between 2001 and 2007 in the same study area. The Panel welcomed this information and thanked Gailey and colleagues for their contribution and dedication to collecting these data.

The Panel expressed disappointment that the 2008 field season started later than any previous one and therefore data were obtained only during August and September (as compared to previous years when fieldwork typically began no later than mid-July). This change in the data collection period hinders multi- or inter-year comparisons of observations especially for the early portion of the feeding season. The Panel **recommends** that Sakhalin Energy re-institute the previously typical timing of the behaviour work so that it begins no later than mid-July in 2009 and beyond.

The work of the behaviour monitoring team, as was also true for the distribution (WGWAP-6/14) and photo-ID (WGWAP-6/5) teams (see Items 5.1 and 7.2), recorded a change in distribution as well as reduced relative abundance of whales in the near-shore feeding area during 2008. Further, the number of whales identified (n=29) from shore-based photo-identification efforts of the behaviour team was markedly lower than in 2007 (n=75). The Panel also noted differences, in comparison to previous years, in a number of

parameters related to surface time, dive time, respiration and movement as recorded in 2008 (see Table 16 of WGWAP-6/13). For example, higher or lower values (at least qualitatively) were recorded for the following variables: Ranging Index, Blow Interval, Surface Time and Dive Time. These annual differences in behaviour have yet to be tested statistically, however, so conclusive statements about their possible significance would be premature.

The Panel noted that the results presented in WGWAP-6/13 might have been influenced (and confounded) by the effects of anthropogenic activities (*i.e.* pile driving and seismic survey) occurring in near proximity to the near-shore feeding area. In light of this, the Panel **encourages** Gailey and colleagues to integrate all available information, including anthropogenic noise, into their full analysis of the 2008 data.

#### **5.4 Results from Sakhalin Energy/ENL noise monitoring programme**

POI and Sakhalin Energy representatives summarised the data and information in WGWAP-6/15 on POI acoustic buoy deployments during the 2008 season in and around the Piltun and offshore feeding areas. POI deployed a total of 22 autonomous acoustic and/or hydrological sensors. Sixteen AUARs (Autonomous Underwater Acoustic Recorders) recorded acoustic data continuously for several weeks but for different intervals owing to different deployment schedules; two deployment intervals were performed by most of the stations. Acoustic recordings were made across a relatively broad frequency spectrum (2 Hz to 15 kHz) encompassing the band of interest relative to sounds from industrial activities in the area, other noise sources (*e.g.* weather events) and biological activity, including any vocal behaviour of gray whales. Data presented in the report text and provided in an annex to it were in 1-min averages across this entire frequency band per day, or 20-min averages for many days to show daily trends across 1-2 weeks. The verbal presentation summarised measurements of ambient noise in areas of interest, including increases associated with natural events (*e.g.* a strong storm in late September 2008) and human activities (*e.g.* nearby vessel operations, construction and exploration activities on the part of other companies in the area). Additionally, the results of a transmission loss experiment using playbacks of a frequency-modulated signal to test the accuracy of sound propagation models in the area between the 'offshore' feeding area (OFA) and a proposed new Arkutun-Dagi platform location (ENL) were presented and discussed. The 2008 acoustic results of greatest interest to the Panel, however, *i.e.* the low-frequency sound levels generated by on-land pile driving at the ENL Odoptu site (see WGWAP-5 report) and measured at various distances from shore and directly in the Piltun feeding area, were missing from the text of WGWAP-6/15 as well as from the verbal presentation of the report. It was only mentioned in the Conclusions section of WGWAP-6/15 (p. 96) that the measurements during the pile-driving periods had been consistent with the results of transmission loss experiments acquired on the same profile in 2006 and 2007.

There was a lengthy discussion between panel members and Sakhalin Energy representatives regarding the dates and areas of coverage relative to anthropogenic sound events known to have occurred in the area in 2008. Although Sakhalin Energy's own construction work had been completed before the 2008 season, and it did not carry out a seismic survey in that season, the pile driving and other construction activities at the ENL site, as well as airgun operations by another company in the same general area, were known to have taken place during periods when the POI hydrophones were active. Indeed, some industrial sounds are evident on the POI recordings. However, interpretation of the data regarding received exposures within the feeding areas, and the potential significance of



these exposures to the whales, were limited by a number of factors. The main points of concern to the Panel are as follows:

1. The information provided regarding the nature and specific timing of relevant activities, either on the part of Sakhalin Energy (*e.g.* vessel transit) or other companies (*e.g.* pile driving, seismic operations), was insufficient for relating specific events to specific sounds on the recordings as presented.
2. The manner in which the acoustic data were presented continues to make visual inspection of discrete, impulsive low-frequency acoustic events difficult to interpret.
3. The pile-driving activity was reported to have stopped on 4 July and the two nearest acoustic recorders were not activated until 1-2 July.
4. Not all of the 1-min sample data for areas of interest (*i.e.* these recorders during 1-4 July and the control station nearest to the area of the seismic survey north of the Piltun feeding area in September) were available to the Panel; Sakhalin Energy noted that this was inadvertent and related to a problem encountered in distributing some of the data and that all measurements would be made available to Panel members by the end of the meeting. This was accomplished but only after it was too late to consider at the meeting.
5. The recordings made on the control hydrophone nearest the September 2008 seismic survey north of the Piltun feeding area were overloaded (or ‘clipped’) for much of the time during which the seismic operations were believed to have occurred. Sakhalin Energy representatives noted that this was due to the relatively low saturation level set for this recorder because it was placed relatively far from any known or anticipated industrial activities. It was their view that little information could be gleaned from these data. The Panel agreed that it was unfortunately true that actual received levels could not be determined since the recordings were clipped but it disagreed that no information could be drawn from this. Rather, the Panel **concludes** that the recordings demonstrated that low-frequency ambient noise was dominated by industrial activities in this northern part of the feeding area from about 7 September 2008 through much of the rest of the month, at levels at least as loud as the saturation level of the hydrophone (reported by Sakhalin Energy representatives as 124 dB re. 1 $\mu$ Pa).
6. The available information relating specific acoustic events (either natural or industrial) to sightings and/or behavioural observations of whales was insufficient to support meaningful interpretations. The lack of synchronised acoustic, operational and behavioural data makes the interpretation of exposures and associated whale responses extremely difficult. This is the kind of data required for development of scientifically defensible exposure threshold and/or dose function guidelines for use in assessing and mitigating noise impacts on marine mammals.

The Panel **welcomes** the acoustic data provided, noting that these data contribute to understanding of daily variability in natural ambient noise across much of the whale feeding areas of interest, as well as understanding of how strong weather events can elevate background noise in these areas. A systematic, rigorous deployment regime for monitoring underwater ambient noise and industrial acoustic events in the western gray whale feeding areas is important and should continue. The Panel makes several **recommendations** related to the analysis, form of presentation and availability of Sakhalin Energy acoustic data. Firstly, spectrograms with clear and consistent depictions of received amplitude levels should be presented for all recorders, including data from T-AUARs and the archival

sonobuoys. Secondly, these plots should present the acoustic data in a format described in a previous MNR report, specifically Figure 1.8 in 'WGWAP\_13E\_MNR\_Report\_Acoustics\_Volume\_1\_2005.pdf'. Most importantly, frequency analysis should be in 1 Hz steps from 1-1000 Hz along a linear rather than logarithmic axis, time integration windows should be  $\leq 1$  min, and the plots showing composite received levels should be larger and more discernable. Thirdly, all additional information on days and locations of interest relative to known industrial events should be made available for analysis. Finally, all acoustic data should be archived in such a format that subsequent analyses using additional acoustic metrics (*e.g.* peak sound pressure, kurtosis) are possible.

Based on the information presented under this agenda item, as well as under 5.1 above, the Panel **noted** that the temporal coincidence of industrial events in early to mid-September 2008 (specifically seismic operations to the north of the Piltun feeding area beginning around 7 September and on-land pile driving operations at the ENL Odoptu site re-starting on 10 September) with the decline in relative abundance of whales during approximately this same time interval (see 5.1 above) is suggestive of an acute response to disturbance. The Panel clearly **recognizes** that the available information is too limited to draw firm conclusions in this regard and also that other acute and long-term variables (both biological and anthropogenic) may have contributed to the observed changes in whale distribution. However, the relatively close temporal association of these industrial activities with the rapid decline in gray whale sightings is notable and was, as indicated under Items 2 and 6.5, one of the factors involved in the Panel's ultimate recommendation not to proceed with the Astokh 4-D seismic survey in 2009.

### 5.5 Results from Sakhalin Energy/ENL benthic monitoring programme

Fadeev presented a synopsis of data collected by the Sakhalin Energy/ENL benthic monitoring programme in the Sakhalin II project area in late summer and early autumn 2008 (WGWAP-6/12). The synopsis reflected data on benthic invertebrate and fish abundances, sediment grain size characteristics, and concentrations of petroleum hydrocarbons, persistent organic pollutants and heavy metals in sediments. Samples were collected in the two recognized gray whale feeding areas and in several other areas where whales were observed in 2008. Data from 2008 samples were compared to data collected in previous years in the project area. Also, reference was made to studies of stable isotopes and molecular biomarkers in benthic organisms, intended to inform ongoing discussions of the effects of natural effluents from Piltun Lagoon on the structure and dynamics of benthic ecosystems in the adjacent Piltun feeding area.

Biomass densities of major taxonomic categories of benthic organisms (including sand lance, *Ammodytes hexapterus*) measured in 2008 samples were reported as being similar to those measured in recent years, and no statistically significant trends in biomass densities are apparent over the past several years (2005-2007 for sand lance and 2006-2007 for amphipods as stated in WGWAP-6/12). This conclusion applies to the major categories of benthic prey of gray whales, including the amphipod and isopod crustacean populations that dominate the benthic assemblages where whale feeding occurs. Biomass densities of potential gray whale prey species in the offshore feeding area continue to be higher than densities in the Piltun feeding area by tenfold or more. The dominant amphipod species differ between the two areas. Fadeev suggested that the dominant amphipod species in the offshore feeding area (*Ampelisca eschrichti*) has lower rates of biomass productivity and cannot sustain foraging pressure from gray whales at the same level as the dominant species

of amphipods (*Monoporeia affinus*, *Eogammarus schmidtii* and others) and isopods (*Synidotea cinerea*, *Saduria entomon*) in the Piltun feeding area.

Measured residues of dichloro-diphenyl-trichloroethane and related congeners (DDTs), hexachlorocyclohexanes (HCHs), petroleum hydrocarbons and heavy metals in sediment samples were low in all cases and do not appear to pose a threat, at concentrations measured in 2008, to the health of resident organisms.

At previous meetings of the Panel, Fadeev had discussed the possibility that sand lance are prey of gray whales in the project area. Sand lance are forage fish that occur in large aggregations and are preyed upon by several marine mammal species. They have the habit of burrowing into sandy sediments when at rest. This burrowing habit may facilitate their vulnerability as prey of foraging gray whales. Interest in sand lance abundance emerged in 2004 when apparently increased use of the northern portion of the Piltun feeding area by gray whales correlated with observations of isolated, high-density patches of sand lance as measured in the benthic surveys. The mean benthic densities of sand lance in 2008 were similar to levels seen in recent years, and there is no statistically significant trend in mean densities over the past five years. In his written report of 2008 field studies (WGWAP-6/12), Fadeev stated that spatial and temporal variability of benthic sand lance density 'may be a factor to help explain shifts in whale distribution, particularly to the offshore feeding area' (see sections 5.1 through 5.3 of WGWAP-6/12). However, he also noted that benthic accumulations of sand lance are 'sporadic compared to the consistent, rich amphipod complex that provides the main food source of gray whale'.

Stable isotope data indicate that primary benthic consumers, both in the Piltun feeding area and within Piltun Lagoon, are sustained primarily by phytoplankton and not by detrital material generated within the lagoon and its watershed. Data on eicosapentaenoic acid, an essential polyunsaturated fatty acid and informative molecular biomarker, indicate that the principal phytoplanktonic food source for benthic primary consumers is diatoms. It remains possible that lagoon effluents enhance benthic productivity in the Piltun feeding area through exportation of diatom populations or inorganic nutrients crucial to the productivity of diatoms, such as nitrate or phosphate. However, the data presented by Fadeev indicate that the hypothesis that detrital export from Piltun Lagoon is significant to productivity in the Piltun feeding area should be rejected.

When asked to explain why the analyses of persistent organic pollutants have been limited to DDTs and HCHs, and why there have been no analyses of polychlorinated biphenyls (PCBs), Fadeev explained that there was an expectation that DDTs or HCHs, as agricultural pesticides, might be present as a result of runoff from terrestrial sites on Sakhalin Island, but that there was no *a priori* expectation of significant PCB residues in sediments within the project area. VanBlaricom observed, however, that PCB contamination of coastal marine environments is a frequent consequence of industrialisation and it is recognised globally as a major marine conservation issue. Therefore, it would be reasonable to expect that PCB levels will increase over time in the vicinity of Sakhalin II as development continues, and any increasing trend in PCBs or other persistent organic pollutants in the region could pose a health threat to gray whales. It is important to monitor concentrations of such pollutants as part of the larger effort to monitor and mitigate the effects of the Sakhalin II project on gray whales.

It was suggested that an effort be made to link benthic data with observed patterns of poor body condition and subsequent recovery in adult female gray whales in the Sakhalin II project area (see section 7.2 of WGWAP-6/12). A point of particular interest to the Panel was the suggestion by Fadeev and colleagues that adult females feeding in the offshore area

experience a benefit in rates of recovery from poor body condition associated with pregnancy and lactation. The Panel noted that the integration of benthic data with information on other habitat attributes and with data on individual whale identification, behaviour, distribution, movements and condition is an essential topic to be addressed by the MVA workshop(s) (item 9.2; also see previous WGWAP reports).

The term ‘feeding area’ for western gray whales should be applied conservatively. On the basis of currently available information, it should be reserved for the Piltun and offshore areas in which substantial numbers of whales have been known to feed over a number of years, and for which extensive data are available on likely prey populations. An alternative term such as ‘possible or suspected feeding area’ should be applied to locations such as Kamchatka, where whales are known to occur and probably feed but where the longevity of feeding activity is either less well established or unknown and in which the status of prey resources is not well known.

The Panel is interested in obtaining information on prey resources in areas near the Kamchatka Peninsula and the Commander Islands where gray whales have been observed in recent years. Such information will be valuable for understanding how the whales use such locations and why they move among newly identified and ‘traditional’ areas.

The Panel commended Fadeev and his project team for the continued excellence of the benthic monitoring programme in the Sakhalin II project area.

## **6 ACTIVITIES OF OTHER COMPANIES IN 2008**

### **6.1 Seismic surveys**

As noted in the report of WGWAP-5, a 2-D seismic survey was conducted by Elvary from 5 September to 10 October 2008 immediately north of the Piltun feeding area. Also as noted previously, Knizhnikov had expected to receive a detailed report on the survey from the company in early 2009 but no such report had been received at the time of WGWAP-6 and he had nothing new to offer. No information on other seismic survey work in the region was available.

### **6.2 Pile driving**

No new information beyond that summarised in the report of WGWAP-5 was available for consideration at this meeting. Acoustic data likely corresponding to on-land pile driving activity at the ENL Odoptu site were provided as an addendum to WGWAP-6/15 (see Item 5.4).

### **6.3 Other**

No additional information on other companies’ activities in 2008 was available.

### **6.4 Summary of efforts to obtain information**

As discussed in the report of WGWAP-5, the Panel’s terms of reference refer to the need for ‘access to all the relevant information and data from all interested parties’ if it is to meet its objectives of assessing and minimising the impacts of industrial activity on western gray whales. Ideally, all such information on planned activities of potential harm to the whales should be provided in advance, but at a minimum it is critical to know the nature, location and timing of events after the fact. The lack of this information can undermine the ability of the Panel, and indeed of the companies sponsoring much of the gray whale monitoring and

research work off Sakhalin, to interpret the acoustic, distribution and behaviour data collected during the gray whale feeding season.

It was generally agreed that the collective efforts by Panel members, IUCN and Sakhalin Energy had not been adequate to obtain the needed information from 2008 although it was acknowledged that Sakhalin Energy had managed to obtain and provide some basic information on ENL pile driving (as noted in WGWAP-6/15). Therefore, the Panel **recommends** that Sakhalin Energy, IUCN and the Russian Ministry of Natural Resources (MNR) make a concerted effort to obtain all relevant information on activities by other companies during the 2008 field season. The Panel **acknowledges** the efforts by IUCN to bring a representative from MNR to this meeting and **recommends** that the level of coordination and consultation between IUCN and MNR be expanded as feasible. Also, the Panel **expresses its appreciation** for the efforts by WWF-Russia, in particular, to obtain and share this type of information and **welcomes** the continued input from NGOs in this regard.

### **6.5 Synthesis of 2008 DISCUSSIONS: panel conclusions**

The report of WGWAP-5 expresses the Panel's concern over the apparently anomalous distribution of whales in summer 2008, in particular the apparently exceptionally low number of whales, as compared to previous years, in the near-shore (Piltun) feeding area in July-September (including data from both Sakhalin Energy and the Russia-US research team). It notes that this scarcity may have been related to underwater noise produced during onshore pile-driving activities undertaken by ENL on the northern Piltun barrier spit adjacent to the Odoptu block.

In view of the fragmentary nature of the information it had available at WGWAP-5, the Panel had recommended (WGWAP 5/011) that a moratorium be implemented on industrial activities, as summarised above under Item 1.1. The Panel had further advised that in view of the uncertainty concerning the distribution and numbers of gray whales present during the 2008 season (and the 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 was available about industrial activities and whale distribution in 2008, and preferably also until data from 2009 are available that might indicate whether the distribution and numbers had returned to 'normal'.

The Panel **welcomes** the additional information on the 2008 season provided by Sakhalin Energy in its distribution, behaviour, photo-identification, benthic and noise monitoring reports (see section 5, above) and that presented at this meeting by WWF-Russia. The new information has heightened rather than diminished the Panel's concern that whale distribution and behaviour may have been seriously affected by industrial activities – on land and offshore - in 2008.

Although the information available on industrial activities in 2008 is still incomplete, the pile driving on the northern Piltun barrier spit adjacent to the Odoptu block stopped on 5 July and was resumed on 10 September. Also, a seismic survey to the north of the Odoptu block, whose signature is evident in the acoustic recordings (WGWAP-6/15), continued through most of September and into October.

The shore-based behaviour monitoring data for 2008 indicate a substantial reduction in numbers of whales in the central and northern part of the near-shore study area (note that the behaviour study area is entirely to the north of the mouth of Piltun lagoon and corresponds to the area covered by the shore-based distribution stations 2 to 8) relative to previous years, with similar numbers relative to previous years in the southern area. As

discussed under Item 5.3, the 2008 behaviour results (WGWAP-6/13) appear to show (at least qualitatively) uncharacteristic behaviour in 2008. For travelling whales, for example, the 2008 data point is an extreme (highest or lowest) value for 10 of the 13 behavioural metrics reported. Additional statistical analyses of these data are needed, however, before any conclusions can be reached regarding whale behaviour in 2008.

The distribution and photo-ID data (Items 5.1, 7.2 and 7.3) indicate substantially fewer gray whales in the near-shore (Piltun) area compared with previous years, and correspondingly more in the offshore feeding area to the southeast of Piltun and off Kamchatka. The currently available information is insufficient to ascribe a definite cause to the apparent shift in distribution. Multiple factors may have been responsible, and their relative contributions may have varied as the season progressed. As stated under Item 5.5, the benthic monitoring data provide little support for the hypothesis that the shift was related to food availability or foraging conditions.

The Panel generally cautions against the assumption that the different feeding areas are interchangeable from the whales' perspective. The shallow, near-shore feeding area has been preferred consistently by cow-calf pairs even though the benthic data suggest higher biomass in the offshore area.

It is also not known at this time whether the changes in distribution that occurred in 2008 were negative, neutral or positive with respect to whale feeding success, nor how they may ultimately affect health and reproductive success. The first indications relating to this question will be the observations of body condition of whales returning in 2009. Effects on calving success and survival can only be determined retrospectively, and will not be discernible until at least the 2010 photo-ID data have been processed and incorporated into a population assessment model.

The Panel **concludes** that with the current state of knowledge, the precautionary approach is to act on the assumption that the shift in distribution evident in 2008 was caused by anthropogenic disturbance, and that it will have negative implications for feeding success and ultimately reproductive success. This implies that disturbance to the near-shore feeding area, from which whales apparently were displaced in 2008, and which has to date been the primary feeding area for cow-calf pairs, should be minimised in the 2009 season. This precaution should remain in effect until more information is available to reduce the Panel's concerns.

## **7 PHOTO-ID**

### **7.1 Progress report from Photo-ID Task Force**

The Photo-ID Task Force met for 1½ days immediately prior to WGWAP-6 and its full report is expected to be posted on the IUCN website in June. Meantime, a verbal summary of the draft report was presented to the meeting by Cooke.

The Task Force cleared the list of tasks assigned to it at WGWAP-5 in the sense that all tasks were either completed successfully or it was agreed to drop them. In some instances new tasks were identified to succeed or replace earlier ones.

The cross-matching of catalogues was updated through the 2007 season. There was complete agreement on the matching. There was also complete agreement on a subset of 20 whales for which annual sighting histories, by aspect, were compared between the two research teams. The Task Force **recommended** that the cross-matching of the catalogues be updated annually.

Comparison of cow-calf pairs identified by the two teams revealed some discrepancies, all of which could be resolved without ambiguity in the data through 2007, but this issue remained open with respect to future data.

The Task Force **recommended** that a population analysis based on the combined photo-ID data sets should be conducted in time for WGWAP-7. Representatives of the two teams agreed on details.

The Task Force **recommended** that it be continued, with the reduced list of remaining tasks identified in the pre-meeting workshop report, and that it should try to meet again in-person, preferably immediately prior to WGWAP-7.

The Panel **endorses the recommendations** of the Task Force, including that it continue to function and address the list of tasks, with the addition of any additional work arising from recommendations of the Panel. The Panel **requests** that the membership of the Task Force be specified soon after WGWAP-6.

## 7.2 Results of IBM photo-ID of western gray whales in Sakhalin

Tyurneva presented results of the 2008 photo-identification worked carried out by the Institute of Marine Biology (IBM) as part of the Sakhalin Energy annual programme (WGWAP-6/05). Photo-ID effort was conducted off northeastern Sakhalin Island on 29 days between 25 June and 23 July and between 24 August and 10 October. There was relatively less effort there than in 2007 due to poor weather conditions and the fact that a ship-based survey took place in other parts of the Okhotsk Sea between 24 July and 23 August. Of the 29 days of photo-ID effort off Sakhalin, 21, 7 and 1 of them were spent in the Piltun, Offshore, and Chaivo study areas, respectively. In total, 98 whales were identified in these areas, including three calves (*i.e.* seen with a mother) and two probable calves (*i.e.* seen independent of a mother). These five whales were the only previously unidentified whales photo-documented in 2008.

The 98 whales identified in 2008 consisted of 36 seen only in Piltun, 36 only Offshore, 25 both in Piltun and Offshore (including 1 whale also sighted near Okha) and 1 off Chaivo. The number of whales identified in Piltun was substantially lower than in previous years, while the number identified in the Offshore area has reached a maximum over the last two years. The average number of sightings per whale in 2008 was 2.81, down from 5.22 in 2007. Twenty whales were considered to be in compromised body condition, including three nursing females. The proportion of whales considered in compromised body condition declined over the study period. Five of the six nursing females identified in 2007 were re-identified in 2008; in each case, improvement in body condition was observed. Persistent skin anomalies on at least 3 whales were documented in 2008.

Five days of photo-ID effort were conducted in Olga Bay, eastern Kamchatka, between 19 and 29 August 2008 by a research group collaborating with IBM. In total, 50 whales were identified, including 16 individuals sighted previously in Olga Bay and 34 that were new to this area. Of the 50 Olga Bay whales, 25 were known from northeastern Sakhalin. Eight of those 25 had been seen previously in Olga Bay and 17 were new to that area in 2008. One of the whales was seen in both Olga Bay and off Sakhalin in 2008. It is unclear if the 25 Olga Bay whales not previously identified off Sakhalin represent eastern or western gray whales. There appears to be an increasing trend in the number of gray whales using Olga Bay, particularly whales previously identified off Sakhalin. A mother-calf pair was observed for the first time in Olga Bay in 2008. The associated mother had been sighted off Sakhalin in 2002-2006, where she was last documented with a calf in 2003, and then in Olga Bay in 2007. Of the 6 calves and 3 probable calves identified off Sakhalin in 2007, 8

were seen in Olga Bay in 2008. Sixteen Olga Bay whales were considered to be in compromised body condition, but no cases of skin anomalies were observed.

Photo-identification efforts by IBM and other researchers outside northeastern Sakhalin and Olga Bay identified: 1) a whale off Shiashkotan Island (in the Kuril Islands) that was also sighted in Olga Bay in 2007 and 2008, 2) a whale off Medny Island (in the Commander Islands) that was sighted in Olga Bay in 2007 and 2008 and off Sakhalin in 2007, and 3) four whales off Karaginsky Island (northeastern Kamchatka) that had not been previously identified.

To date, the 2002-2008 IBM Sakhalin catalogue consists of 165 unique individuals, plus 9 temporarily identified individuals (*i.e.* whales identified by only a left-side photo or a poor-quality right-side photo). The 2004-2008 Kamchatka catalogue is comprised of 78 unique individuals, of which 39 are also in the IBM Sakhalin catalogue. When sightings from both northeastern Sakhalin and Olga Bay are considered, 122 out of the 165 whales in the IBM catalogue were observed in 2008. The total number of gray whales identified from both catalogues in 2008 was 147, including 97 whales sighted off Sakhalin, 49 sighted in Olga Bay and 1 sighted in both areas.

The Panel thanked Tyurneva for the clear and comprehensive report of these important findings.

In response to questions, Tyurneva indicated that the IBM team had probably photo-identified all of the whales in Olga Bay in August and therefore more days of effort presumably would not have led to increased identifications. Of the whales observed off both Kamchatka and Sakhalin in the same season, all were first observed in Kamchatka. A survey of western Kamchatka and the Kuril Islands from 24 July to 23 August encountered poor weather and only one gray whale was identified (off Shiashkotan Island in the Kuril Islands).

The identification in 2008 of a mother-calf pair off Kamchatka was an interesting new observation. However, in view of the problems found by the Photo-ID Task Force with identifications of some mother-calf pairs, the Panel **recommends** that the Task Force examine photos of this calf carefully to verify its status.

The Panel noted a few discrepancies between the data in document WGWAP-6/05 and the counts in the report of the Photo-ID Task Force. Tyurneva indicated that the data given to the Task Force were the more current version. The Panel **recommends** that data sets be assigned version numbers and that a record of all retrospective changes to data be maintained.

The Panel noted that whales were probably present off eastern Kamchatka for a much longer period in the season than the period of collection of photo-ID data, and would welcome additional information on the seasonality and duration of whales' residence off eastern Kamchatka.

### **7.3 Results of Russia-US photo-ID programme in 2008**

Tsidulko presented the results of the photo-ID work by the Russia-US team in 2008 when 12 boat surveys involved 47 hours of survey effort. A total of 45 distinct whales were identified, including 3 calves. The 42 non-calf animals had all been identified in previous seasons. Of the three mothers of the year in 2008, two had previously been observed to calve, and one was a new mother. This brings the number of known reproductive females in the population to 25.



The effort and observation data suggest that there were fewer whales in the study area in 2008 than in previous years. This was already apparent to the researchers on the first survey on 8 July when they travelled 18 km north from the mouth of Piltun Lagoon without seeing a single whale despite excellent visibility. The finding of fewer whales in the area in 2008 was consistent with the findings of the Sakhalin Energy distribution and behaviour monitoring teams (see Item 5) and those of the IBM photo-ID team (see 7.2).

Tsidulko noted three recent publications based on data from the Russia-US team (Bradford *et al.* 2008; Bradford *et al.* 2009; Weller *et al.* 2008).

#### **7.4 Progress on update of population assessment**

A population assessment based on the Russia-US data through the 2007 season had been presented at WGWAP-5, the IWC Scientific Committee meeting in June 2008 and the IUCN Range-wide workshop in Tokyo in September 2008. Cooke reported that it was planned to present an updated assessment using the Russia-US data through the 2008 season at the next IWC Scientific Committee meeting in June 2009.

As recommended by the Photo-ID Task Force, it is planned to present an assessment based on the joint Russia-US and IBM data sets at WGWAP-7.

### **8 MMO PROGRAMME AND CARCASS DETECTION**

#### **8.1 2008 MMO programme final report**

In 2008, 12 Marine Mammal Observers (MMOs) were deployed during the period from 12 June to 26 November (WGWAP-6/16). As is usually the case, the vast majority of the 774 sightings of marine mammals were of pinnipeds but sightings of nine different species of cetaceans were also reported. Broker noted that the relatively large number of sightings of pinnipeds and cetaceans other than gray whales (768 sightings, 4117 sighted animals) serves as evidence for the general alertness and competence of the observer corps. Only six sightings of a total of eight gray whales were reported. Three of these observations were within 1 km of the vessel and the other three were 1-2 km from the vessel. No collision avoidance measures (*e.g.* change in course or speed) were deemed necessary.

The Panel was especially concerned about the operations of the crew change vessels, which carry MMOs but operate at night and during storms when visual detection of cetaceans would be severely compromised, at best. In 2008 about 15% (267 hr) of travel time logged by the crew change vessels was at night. Each crew change trip lasts 4-5 hours and only a single MMO is onboard, which means that watch times can be very long.

The infrequency of observations of gray whales by MMOs aboard crew change vessels (only two of the six sightings in 2008) is of interest because the 'crew transfer corridor' approximately bisects the area between the near-shore (Piltun) and 'offshore' feeding areas (WGWAP-6/16, Fig. 2.3). Whales are known to move between these two feeding areas during the open-water season and therefore likely intersect the path of the crew change vessels. How often such movement occurs in a given season, however, is uncertain.

The Panel **requests** that Sakhalin Energy prepare an analysis for WGWAP-7 that compares MMO observations across years, with emphasis on the crew change vessels (also see Item 12.1). This analysis should include consideration of any patterns that might be informative with regard to trends in whale habitat use (*e.g.* movement between the two feeding areas), sighting distances in relation to visibility indices, percentages of time covered by MMO

effort in different conditions (*e.g.* at night, in fog, in heavy sea states) and average duration of watches by MMOs.

## **8.2 Update on distribution of necropsy manual**

Larsen reported that the necropsy manual is posted on the IUCN website ([http://www.iucn.org/wgwap/publications\\_and\\_reports/](http://www.iucn.org/wgwap/publications_and_reports/)). He is collating input from the Russian panel members and from Sakhalin Energy on relevant individuals and institutions in the Russian Far East and IUCN will ensure that the manual is distributed accordingly.

## **8.3 Update on necropsy kit**

As agreed at WGWAP-5, the Panel provided Sakhalin Energy with detailed specifications for a necropsy kit and Broker reported that the company was proceeding to purchase the items and assemble three kits for placement at strategic sites on Sakhalin Island (*e.g.* locations with existing caches of oil spill response equipment) starting in June 2009. He estimated the total cost per kit at approximately US\$2500. Sakhalin Energy offered to provide an update on kit deployment at WGWAP-7.

## **8.4 Carcass survey report**

The Panel was pleased to learn that its recommendations in relation to carcass survey efforts by Sakhalin Energy had been fully implemented in 2008, with dedicated survey flights conducted monthly from July to November supplemented by opportunistic reconnaissance during crew change flights and vigilance by MMOs and land-based research and monitoring teams. Only one carcass, reportedly that of a common minke whale, was found and examined (WGWAP-6/21). The Panel raised a number of questions concerning the data provided in WGWAP-6/21. The single photograph included in the report was not diagnostic for species identification and it was noted that additional views would have been helpful in that regard (although the photograph was adequate for establishing that the animal was a balaenopterid and not a gray whale). Also, no information was provided on body size even though the Marine Mammal Mortality-Injury Report form in Sakhalin Energy's Marine Mammal Protection Plan (WGWAP-6/1, Annex 2) includes lines for 'morphological data'. Only a portion of the completed form was reproduced in the carcass survey report. The Panel **stressed** that given the time and other resources invested in documenting strandings such as this one, additional data and more photographs should be provided. For example, photographs from several different angles could not only aid in confirming species identification but also provide evidence on cause of death (*e.g.* entanglement, ship strike). Sakhalin Energy representatives assured the Panel that additional photographs and data are available to support the identification in this instance and that future reports documenting cetacean carcasses will take into account the points raised by the Panel at this meeting.

# **9 MULTIVARIATE ANALYSIS (MVA)**

## **9.1 MVA of 2006 data – preliminary report**

The Panel was pleased that Gailey was able to provide a more advanced report on the 2006 MVA than originally anticipated for this meeting although he stressed that the material presented was still preliminary (WGWAP-6/18). Indeed, as explained in the report of WGWAP-5 (Item 8.1), the final report was not expected to be ready before May 2009. Gailey reported at the present meeting that initial results of a Principal Components Analysis and a proposed modelling approach had been sent to the external reviewer in early

March 2009 and the reviewer's comments had not yet been received and incorporated. Due to the preliminary nature of Gailey's presentation, the Panel chose not to comment in detail at this time and to await the final report. However, it commended Gailey for a thoughtful, rigorous presentation and noted that this work would likely serve as a very useful input to an eventual MVA workshop (see Item 9.2). During the discussion following the presentation, it was suggested that an independent assessment of the complex analysis underlying the acoustic input to the MVA model would be useful and the Panel agreed that this could be included as a separate exercise within the context of the MVA workshop.

## **9.2 Update on progress with MVA workshop(s)**

Donovan reported that he had discussed this initiative with scientists at St. Andrews University and that they had expressed interest and a willingness to prepare an outline and preliminary budget for discussion with Reeves and Donovan during the IWC Scientific Committee meeting in June 2009.

## **10 OIL SPILL PREVENTION, PREPAREDNESS AND RESPONSE**

Dicks summarised WGWAP-6/9, which covered progress on the following panel tasks:

- Review Sakhalin Energy's Oil Spill Response Plans (OSRPs) for Lunskeye, Piltun Astokh and Prigorodnoye (Aniva Bay);
- Compare the OSRPs with published handbooks (discrepancies had been noted in a previous review);
- Review new data characterising Vityaz crude oil (analyses by AEA Technology and Leeder Consulting);
- Compare the findings of this OSRP review with a review of the same plans conducted by PCCI on behalf of the lenders;
- Review the technical merits of Sakhalin Energy's application for pre-approval for dispersant use.

At the outset, Dicks apologised for accidentally omitting section 4 (the PCCI comparison) from the meeting version of WGWAP-6/9 and promised that a revised version would be posted on the IUCN website immediately following WGWAP-6.

### **10.1 OSRP Review**

The OSRP review revealed that many of the issues and concerns noted at WGWAP-4 and WGWAP-5 about the effectiveness of oil spill response had been addressed in the current version of the plans. Examples include (in no particular order of priority):

- The oil spill 'worst case' scenarios have been revised and are much more realistic. The worst cases now include spills potentially larger than the 1,500-tonne threshold as required by Russian legislation. Also, the available spill response resources appear adequate to meet worst-case needs; this will be verified during a proposed site visit by Dicks in 2009 – see below.
- There is a reduced emphasis on dispersant use as a response option and clear statements regarding the non-use of dispersant in gray whale feeding areas.
- The plans now adopt a more realistic and cautious approach to spill response in ice and to *in-situ* burning.

- Deployment arrangements for defence and deflection booms around lagoon entrances are now more realistic and are tailored to the likely sea and shoreline conditions at the individual sites.
- Response techniques that were in question in earlier versions of the plans, such as prop-washing, dispersing oil using fire monitors and bioremediation, have been suitably amended.
- A memorandum-of-understanding is now in place between Russia and Japan to cover spill response coordination should a spill from Sakhalin II operations enter Japanese waters.
- Although the plans contain almost no detail on emergency contacts for response personnel and government agencies, the contact procedures are well defined and Sakhalin Energy has confirmed that all of its response personnel have full access to the necessary details.

One outstanding issue in the plans relates to shoreline sediment flushing techniques and the application of sediment reworking (*i.e.* moving oily sediments down the beach to allow natural cleaning by wave action). These techniques have the potential to transfer oil into shallow waters near shore, which could affect areas where gray whales feed. Whilst the plans include a cautionary note that ‘use of these strategies should be avoided where there is the potential for impacts on environmentally and commercially sensitive species’, there is no specific mention of exclusion in areas where gray whale feeding could be affected. The Panel regards this as an important concern. Bell confirmed that Sakhalin Energy is aware of this concern and gave assurance that the company’s response teams have been well briefed on all of the recommendations from the Oil Spill Task Force, including those related to the need to protect gray whale feeding habitat as a top priority.

Another outstanding item relates to oil spill modelling. The Oil Spill Task Force had recommended that the trajectory modelling for Aniva Bay should be re-worked to check the potential for oil in the larger spill scenarios to reach gray whale feeding and migration areas. Again, Bell confirmed that this work was underway and that Sakhalin Energy would report on progress to the Panel at WGWAP-7.

Environmental and whale monitoring after a spill also requires additional consideration. The OSRPs identify the need for monitoring but contain no details. They state that the details appear in two other Sakhalin Energy publications. The Panel **requests** that copies of these other documents be made available for review by the Environmental Monitoring Task Force (see Item 4).

In summary, Dicks stated that in his view the majority of the earlier technical concerns have been addressed in the current plan documents. The OSRPs are now comprehensive and much more realistic in approach than the earlier versions reviewed in 2007. Dicks also noted that he considers the plans to be consistent with international best practice. However, he acknowledged that specifically with regard to spill response in ice, there is no clear definition of international best practice. Therefore, a pragmatic approach to this aspect, which he adopted for his review of the OSRP documents, is to evaluate the quality and quantity of response equipment available and the adequacy of staff training and to consider whether the most up-to-date and effective response options available have been adopted by the company. Throughout the process of OSRP review, the Panel has recognised and noted that the options are limited for response in ice but also that equipment and techniques are improving.

Dicks further noted that OSRPs, as basically procedural documents, are often complex as required by regulators, and in practice the effectiveness of response is determined primarily by the adequacy of equipment and the training and ability of responders. This is why the proposed site visit in 2009 (see Item 4) is important as it is planned to:

- Review equipment present on site by visiting storage and maintenance facilities (jointly with the lenders' advisers, PCCI, if feasible);
- Visit waste disposal sites;
- Take part in an equipment deployment drill;
- Review training, exercises, and understanding and implementation of the OSRPs with the response staff;
- Discuss and resolve any outstanding OSRP review issues.
- Learn as much as possible about the spill at the PA-A platform in 2007.

## **10.2 Handbooks Comparison**

The handbooks have a very different layout and structure to the OSRPs. Discrepancies in response policy and strategy between the handbooks and the plans noted in the 2007 review have been eliminated.

## **10.3 Review of Vityaz Crude Oil Characteristics**

In its review of the OSRPs in 2007 the Panel had noted four topics for which it would be helpful to have additional details on the characteristics of Vityaz crude oil. These were 1) ability of the oil to form stable water-in-oil emulsions, 2) amenity to chemical dispersion, 3) natural dispersability properties and 4) aromatic composition of the crude. The Panel was provided with a report prepared by AEA Technology and the Leeder Consulting Group containing more detailed characterisation of the crude in these four areas.

The additional information on emulsion formation and chemical and natural dispersion characteristics is consistent with earlier data and as a result should not require any changes to the OSRPs or further Panel recommendations. However, the data provided on aromatics were limited, mainly because the analytical technique had not been adequate to properly define the full suite of aromatic components of the crude. Given the importance of aromatic compounds in oil to the potential environmental impacts of a spill, the Panel **recommends** that Sakhalin Energy conduct further, more detailed analyses of the aromatics in the crude oil.

## **10.4 Comparison with Lenders' OSRP Review by PCCI**

Dicks reviewed, on behalf of the Panel, PCCI's summary of the three offshore response plans, as provided by Sakhalin Energy. PCCI's approach was to consider the plans against 'international best practices', largely using OSRP requirements in the United States as the basis for assessment. PCCI concluded that whilst there was a need for some additional documentation and streamlining of procedures, overall the plans were of a high quality and gave due attention to training and drills. It also concluded that worst-case spill scenarios were realistic and that response resources were adequate to meet worst-case needs. Dicks concluded that these findings were generally consistent with the Panel's own review.

### **10.5 Application for Pre-approval for Dispersant Use**

Dicks put forward the view that pre-approval for dispersant use was a valid and beneficial approach with potential to provide some net benefit for spill response. However, he expressed surprise that the NEBA (Net Environment Benefit Analysis) approach used in the pre-approval application was totally different from that set out in the OSRPs. It is based on modelling of likely oil movements and dilution of the oil in the water column, and the hypotheses on which the model is based are highly questionable and open to criticism. The only restraint considered for dispersant use in the modelling is that it should never be used in water less than 10 metres deep. No consideration is given to seasonal variation in the presence of whales, birds or commercial fishing, any of which might require special restrictions. Nor does the approach taken consider the potential conflicts that might arise between lobbies for and against dispersant use, *e.g.* interest in protecting seabirds versus fisheries, or the potential for oil in water to taint important commercial seafood organisms, which could lead to dispersant no-go areas at certain times. No protocols or restrictions on dispersant use are specified in the application and it contains insufficient detail to put appropriate constraints on the pre-approval.

Whilst the Panel could not accept the approach adopted in the pre-approval application, the logic of a potential net benefit from pre-approved and carefully controlled dispersant use was not in question, regardless of the extremely poor approach adopted in this application. From the Panel's perspective, there seemed to be little value in pursuing the shortcomings of this document any further. Bell informed the meeting that the pre-approval had been granted by the authorities but he confirmed that Sakhalin Energy has committed not to use dispersants in the Piltun gray whale feeding area. He also recalled the acknowledgement in the report of the Oil Spill Task Force that, in certain circumstances, the use of dispersants in the offshore feeding area may be warranted, for example to protect particularly sensitive shore areas at certain times of year. This concept is built into the OSRPs and the company would apply the guidelines provided by the Panel and the Oil Spill Task Force.

In discussion, Dicks clarified that dispersants are suitable for use only with light and medium crude oils. There are tradeoffs to consider relating to volatility and viscosity of the crude oil that determine the window for use. In the case of Vityaz crude oil, it seems likely that the window would extend over a couple of days. When asked whether the company was likely to be capable of mounting a response within two days, Dicks noted that dispersant application equipment is available on site (for example helicopter dispersant spraying pods) and that he would look at this aspect of response during the 2009 site visit.

VanBlaricom pointed out that oil spills often provide surprises and he questioned whether the OSRPs contain sufficient flexibility to cope with unanticipated scenarios. Dicks responded that the plans cover a wide range of spill response techniques and that there is a good range of high-quality response equipment on site. The key issue would be whether the response staff is sufficiently trained to adopt and pursue a flexible strategy. One of the purposes of the planned site visit to Sakhalin in 2009 would be for the Panel members to determine whether this is the case. It was agreed that Sakhalin Energy would make every effort to arrange for Dicks to be involved in the running of a response drill during the site visit. This would give him an opportunity to test the degree to which the needed flexibility exists.

## **11 PROGRESS ON RANGEWIDE INITIATIVE**

The report of the IUCN Rangewide Workshop (Tokyo, September 2008) is nearing completion and is expected to be final and public within a month. It will be provided as an

information document to the annual meeting of the IWC Scientific Committee at the end of May 2009.

Progress has also been made on preparation of a first draft of a Western Gray Whale Conservation Plan. Donovan, Reeves, Weller and Larsen met in Gland immediately before WGWAP-6 to advance this work and it is anticipated that an initial draft will be available for the IWC meeting in late May or early June.

The IUCN Global Marine Programme has assumed responsibility for overseeing implementation of the rangewide initiative and conservation plan, in coordination with the IWC Scientific Committee and the WGWAP. Financial support, to date, has come primarily from Sakhalin Energy but it is recognised that the funding base will need to be broadened as implementation proceeds.

## **12 SAKHALIN ENERGY ACTIVITIES IN 2009**

This agenda item was addressed only after the Panel recommendation concerning the proposed Astokh 4-D seismic survey, and the company's response to that recommendation, had been announced at the meeting (see Item 2, above). The seismic survey and associated activities were the only 'exceptional' activities planned by Sakhalin Energy for 2009, and they were effectively precluded by the decision not to go ahead with the survey.

### **12.1 Update concerning annual revisions of Marine Mammal Protection Plan with details on planned human activities in 2009 open-water season**

No significant changes had been made to the plan and Bell indicated that Sakhalin Energy was attempting to develop it in such a way that it would no longer require annual updating. He further stated that although the present oil spill response section is very brief, the company intends for the MMPP to eventually become a concise reference document to be used as a 'checklist' by emergency responders in the event of a spill.

The Panel noted that Sakhalin Energy intends to replace its crew change vessels with catamarans obtained from Norway. Although the Panel was pleased to see acknowledgement in the plan that crew change vessels pose collision risks to gray whales (Table 1 in the plan), it remains concerned about the high speeds at which these vessels are allowed to operate (21 knots, day or night) and the fact that MMO coverage is limited onboard the vessels due to space constraints (also see Item 8.1). Therefore, the Panel **requests** that Sakhalin Energy report back at WGWAP-7 regarding the vessel replacement process and any efforts to improve collision avoidance procedures.

The Panel also took note of the acknowledgement in the MMPP that there is potential for 'high impact' from continuous noise although the MVA of 2005 data 'show no apparent reactions'.

Finally, attention was drawn to a small inconsistency in Table 2 of the MMPP where 'sudden changes in speed and course...' and 'do not pursue ...' are aligned with 'collision' risk whereas these are generally regarded as actions that disturb whales rather than as actions that affect collision risk.

### **12.2 Review of joint Sakhalin Energy/ENL research and mitigation programme for 2009 apart from seismic-related**

Bell summarised briefly Sakhalin Energy's plans for field deployment that had been made on the assumption that the seismic survey would begin in June 2009 and be completed by sometime in July. The whale behaviour and distribution monitoring teams (working

exclusively on behalf of Sakhalin Energy) would have been in the field from mid-June until late July, with demobilisation and redeployment (of the distribution team only) under the standard joint Sakhalin Energy/ENL programme from early August until some time in October. The plan not to redeploy the behaviour team after July reflected the fact that there was a shortage of qualified personnel (a chronic issue) and the intention was to begin the collection of distribution and behaviour data earlier in the season than usual as part of the monitoring and mitigation programme for the seismic survey. It was expected that the regular programme of photo-identification, benthic sampling and whale distribution and acoustic monitoring work would proceed as in past years. With the decision made to postpone the seismic survey, Bell requested input from the Panel on how Sakhalin Energy should reallocate its resources and revise its work plan in 2009.

The Panel expressed the following concerns:

- The importance remains of obtaining early-season whale observations given that the timing of seismic (and other potentially disturbing) work will continue to be a crucial element of mitigation strategies. Therefore, every effort should still be made to deploy competent observers as early in the 2009 season as possible.
- The experience in 2008, and its consequences as reflected in the Panel's conclusions and recommendations at this meeting, demonstrates the importance of obtaining a full complement of data in 2009. It would be regrettable if gaps in the data were to prevent the Panel from making an informed judgement as to whether whale behaviour and distribution have or have not returned in 2009 to that observed in 2007 and earlier.
- The question of whether or not to truncate the collection of behaviour data in 2009 is particularly difficult. The Panel accepts that the constraint imposed by a shortage of qualified personnel to lead the behaviour work, in particular, is a real and longstanding problem. Nevertheless, data on the behaviour and response of individual whales have been both the focus of the MVA work by Gailey (see Item 9) and central to the development of mitigation and monitoring schemes by the Seismic Survey Task Force (see Item 2). Although the apparent shift in whale distribution was the most conclusive indication of an anomalous situation in 2008, certain behaviour parameters also suggested that the whales were behaving and moving differently in 2008 in comparison to previous years (see Items and 6.3 and 6.5).

In view of those concerns, the Panel **recommends** that a full complement of research and monitoring work be carried out in 2009, to include all elements of the programme as in previous years.

During the discussion, Bell noted that the work to be carried out in Kamchatka in 2009 would be part of the joint programme with ENL but that it would not divert effort away from Sakhalin. In other words, Kamchatka is planned as a separate study. The *Academic Oparin*, which made an excursion to the Kuril Islands, Kamchatka and Magadan in 2008, will not be doing so in 2009 and will instead remain available for work off Sakhalin throughout the season. Further, Bell pointed out that one or more transects passing through the Piltun-Astokh licence area where the seismic survey was to be conducted are to be added to the vessel survey design in 2009. Data from these transects may prove helpful in defining the 'perimeter monitoring line' for any future seismic survey of the area. The Panel **welcomes** both of these initiatives and looks forward to reviewing results.



### **13 NON-SAKHALIN ENERGY GROUPS MONITORING**

Like Item 12, this agenda item was addressed only after the Panel recommendation concerning the proposed Astokh 4-D seismic survey, and the company's response to that recommendation, had been announced at the meeting (see Item 2, above). Given that the planned monitoring by non-Sakhalin Energy groups was all centred on the seismic survey, it was not possible to engage in a meaningful discussion of items 13.1 and 13.2 at the meeting.

#### **13.1 Russia-US team plans for 2009**

See above.

#### **13.2 IFAW acoustics**

See above.

#### **13.3 Update on proposed Piltun Protected Area**

Knizhnikov updated the Panel on ongoing efforts led by WWF-Russia to have Piltun Lagoon and the adjacent near-shore feeding area designated as a marine protected area, with the primary aims of protecting key habitat for western gray whales as well as 'important bird areas' and wetlands included in the RAMSAR Convention's 'shadow' list. The Russian Ministry of Natural Resources and Environment has expressed support for the proposal but the Sakhalin regional administration has raised concerns that the designation may impede oil and gas development in the region.

A legally mandated public consultation process (in Moscow and Sakhalin) began on 1 April 2009 and was scheduled to be completed on 31 May 2009. Knizhnikov indicated that he expected the necessary documentation to be submitted to the Rostekhnadzor for final approval in summer 2009. As part of his presentation, Knizhnikov projected images of pipeline construction work in winter 2007-2008 and noted that ENL had not changed its plan to build a pipeline across Piltun Lagoon despite the concerns raised by NGOs and the Panel (see [http://www.iucn.org/wgwap/public\\_statements](http://www.iucn.org/wgwap/public_statements) for the Panel's letter). He also drew attention to the potential threat of oil from on-shore spills at Rosneft production facilities along the northeastern coast of Sakhalin Island, describing them as 'massive and long-term'.

There was some discussion on whether it would be feasible to apply protected area measures on a seasonal basis (*e.g.* during the summer and autumn), thereby accommodating certain kinds of industrial activities during the winter and spring months. Knizhnikov conceded that this was possible in theory but he considered it an undesirable option.

### **14 EXPECTED ACTIVITIES OF OTHER COMPANIES IN 2009**

Knizhnikov provided valuable information to supplement that received on this topic from Russian panel members. Korotkova (MNR) advised the meeting that although MNR had received information about planned activities of the various companies, she was not at liberty to share it with the Panel at this meeting. She suggested that an official request from IUCN should be addressed to the minister, emphasising the Panel's need for such information in advance of the field season in order to develop advice on appropriate monitoring and mitigation measures. According to Knizhnikov, however, much of the information that MNR has is provided through normal Environmental Impact Assessment processes and there is a legal obligation to make it publicly available.

### 14.1 Seismic surveys

Knizhnikov was aware of three possible seismic surveys off northeastern Sakhalin in 2009, one by Venineft (Rosneft) in August-October (EIA available in local libraries), one by Elvary (no details available) and one or more by Rosneft (again, no details available).

### 14.2 Pile driving

There was an inconclusive discussion regarding the fragmentary information available to participants on ENL's plans for additional pile driving on Piltun spit in 2009. It remained unclear whether one or two onshore drilling platforms were planned and thus where and when further pile driving might be required. Knizhnikov reported that some work on an ice bridge across Piltun Lagoon to move heavy equipment related to pipeline construction had been underway in February 2009 but he was uncertain whether this task had been completed. It may be feasible to carry out much if not all of the noisiest construction activity on shore in winter months when gray whales are not present in near-shore waters.

### 14.3 Other

According to Knizhnikov, Gazflot is planning to drill an exploratory well in the Kirinsky gas field in the summer of 2009; an EIA is available in electronic form. Knizhnikov also indicated that he expected ENL to carry out further work related to development of the Arkutun-Dagi field in the 2009 season. However, the only information of which he was aware was in the form of terms of reference for an EIA, which were made available in a public library in Yuzhno, Sakhalin, in November 2008.

### 14.4 Summary of efforts to obtain information

As mentioned under Item 6.4 with regard to 2008 in retrospect, the collective efforts by Panel members, IUCN and Sakhalin Energy had not been adequate to obtain the needed information on industrial activities planned for 2009. Therefore, the Panel **recommends** that Sakhalin Energy, IUCN, the Russian Ministry of Natural Resources, Rosprirodnazor and the Russian Group for Strategic Planning on Western Gray Whale Research increase their efforts to obtain all relevant information on activities by other companies planned for the 2010 field season and that this information be made available for panel consideration at WGWAP-7 and WGWAP-8. The Panel also **recommends** that IUCN collate and prepare graphic presentations of such information (*e.g.* one or more maps of areas of planned seismic surveys with indications of probable timing) as a routine contribution for each future panel meeting. Also, the Panel once again **expresses its appreciation** for the efforts by WWF-Russia, in particular, to obtain and share this type of information and **welcomes** the continued input from NGOs in this regard.

## 15 REVIEW OF OUTSTANDING RECOMMENDATIONS AND REQUESTS, INCLUDING UPDATE ON CUMULATIVE ONLINE LIST

The cumulative list of recommendations made by the various western gray whale panels, beginning with the Independent Scientific Review Panel in 2005, is now publicly available on the internet (<http://www.iucn.org/wgwap/recommendations/>). Reeves acknowledged the efforts by IUCN in compiling, editing and posting the list and also welcomed the input received from Sakhalin Energy shortly before WGWAP-6 on the status of recommendations that are flagged as still 'open'. It was agreed that focused attention would be given to the task of updating the list before WGWAP-7, and that if necessary, specific time would be set aside at that meeting to complete the task through direct discussions

among relevant parties. Those discussions would include consideration by the Panel of suggestions by Sakhalin Energy for changes or additions to the present categories for assigning implementation status.

## **16 WGWAP EVALUATION FOR IUCN**

Turner gave a PowerPoint presentation covering the highlights of his formal evaluation of the WGWAP process, recently completed under contract for IUCN. The full report became publicly available at the WGW web site (<http://www.iucn.org/wgwap/evaluations/>) shortly after the WGWAP-6 meeting, and a formal response by IUCN will be made publicly available within the next few months. During discussion, it was noted that the report appeared to be thorough, balanced and constructive. Reeves thanked Turner for his conscientious work. There was a general expectation that the report would be used by all parties to improve the effectiveness of efforts to mitigate the impacts of oil and gas development on western gray whales.

## **17 ANY OTHER BUSINESS**

It was generally agreed that the next WGWAP meeting would be in Switzerland during the second week of November, by which time at least preliminary information on whale distribution during the 2009 season should be available. After the WGWAP-6 meeting it became clear that a November meeting was not possible and the dates were instead set to be 11-14 December 2009. The possibility of an additional panel briefing by Sakhalin Energy in late January or February was also discussed and it was agreed that this option would be explored further over the next few months by Reeves in consultation with Larsen, Sakhalin Energy and the Panel. Additionally, there are the planned visits to Sakhalin by VanBlaricom, Dicks and Larsen and also the possibility of Environmental Monitoring, Seismic Survey and Photo-ID Task Force meetings immediately preceding the full WGWAP meeting in December.

Sakhalin Energy emphasised the importance of ensuring that Panel expectations are clear with regard to the data and information to be presented at WGWAP-7. This will require regular communications among the panel chairman (on behalf of the Panel), Sakhalin Energy and IUCN during the intersessional period. Given the experience in 2008, both Sakhalin Energy and the Panel recognised that a mechanism needs to be found to allow the Panel to make a provisional evaluation at WGWAP-7 as to whether whale distribution in the summer and autumn of 2009 was more similar to that in 2008 than to that in earlier years.

## **18 REFERENCES**

Bradford, A.L., Weller, D.W., Wade, P.R., Burdin, A.M. and Brownell, R.L., Jr. 2008. Population abundance and growth rate of western gray whales *Eschrichtius robustus*. *Endangered Species Research*.

Bradford, A.L., Weller, D.W., Ivashchenko, Y.V., Burdin, A.M. and Brownell, R.L., Jr. 2009. Anthropogenic scarring of western gray whales (*Eschrichtius robustus*). *Marine Mammal Science*.

International Whaling Commission. 2008. Report of the Scientific Committee. Annex F. Report of the Sub-Committee on Bowhead, Right and Gray Whales. *Journal of Cetacean Research and Management* (Supplement) 10:150-166.

Mate, B.R. and Urbán-Ramirez, J. 2006. The spring northward migration and summer feeding of mother gray whales in the eastern North Pacific Ocean, Bering Sea and Chukchi Sea. Paper SC/58/BRG16 presented to the IWC Scientific Committee, May 2006, St Kitts and Nevis, West Indies.

Weller, D.W., Bradford, A.L., Kato, H., Bando, S., Ohtani, S., Burdin, A.M. and Brownell, R.L., Jr. 2008. Photographic match of a western gray whale between Sakhalin Island, Russia, and Honshu, Japan: First link between the feeding ground and a migratory corridor. *Journal of Cetacean Research and Management* 10:89-91.

## SUMMARY OF RECOMMENDATIONS FROM THE 6<sup>TH</sup> MEETING OF THE GWAP

Recommendation number	Cross-Reference	GWAP Recommendations & Requests	Responsible Party/Parties	Target Completion Date	Sakhalin Energy Response
<b>Item 2: 4-D SEISMIC SURVEY</b>					
GWAP-6/001	Item 2.3	The Panel <b>reiterates its previous recommendation</b> regarding a moratorium on all activities by all companies that could adversely affect western gray whales.	General	None specified	
GWAP-6/002	Item 2.3	The Panel <b>concludes</b> that the moratorium should include Sakhalin Energy's seismic survey and <b>recommends</b> that the survey be postponed, pending the results of a full programme to monitor the distribution and abundance of whales in 2009.	Sakhalin Energy	Closed	
GWAP-6/003	Item 2.3	The Panel <b>reiterates</b> its request that all companies involved in the development of oil and gas resources on the northeastern Sakhalin Shelf join in this international effort and abide by the call for a moratorium on potentially harmful activities until the status of the whale population has been clarified. The Panel specifically <b>urges</b> the Russian Federation to assist in this process.	Various including Russian Ministry of Natural Resources (MNR) and Rosprirodnadzor	None specified	
GWAP-6/004	Item 2.3	In the event that Sakhalin Energy decides to work towards conducting the seismic survey in 2010, the Panel <b>recommends</b> that the Seismic Survey Task Force be reconstituted and reactivated to complete the outstanding items identified in a work plan to be prepared following this meeting.	GWAP and Sakhalin Energy	August 2009	
GWAP-6/005	Item 2.3	Recognizing that possibility [ <i>i.e.</i> that the Panel may reconsider the idea of a seismic survey in 2010], the Panel <b>recommends</b> that sufficient advance planning be made in all aspects of monitoring and mitigation before, during and after the survey to ensure both minimisation of impact and collection of pertinent data.	GWAP and Sakhalin Energy	Planning should begin immediately	

Recommendation number	Cross-Reference	WGWAP Recommendations & Requests	Responsible Party/Parties	Target Completion Date	Sakhalin Energy Response
<b>Item 3: PROGRESS ON PLANS FOR SATELLITE TAGGING</b>					
WGWAP-6/006	Item 3	This exercise [of ranking whales as candidates for tagging] would have benefited from incorporation of the IBM photo-identification data, with an ultimate objective to plot precisely on a map where males have been located in the feeding areas. The Panel endorsed this line of thought and <b>recommends</b> that such a joint analysis be undertaken.	Sakhalin Energy, WGWAP	December 2009	
<b>Item 5: RESULTS OF 2008 DISTRIBUTION, BEHAVIOUR, NOISE AND BENTHIC MONITORING</b>					
WGWAP-6/007	Item 5.3	The Panel <b>recommends</b> that Sakhalin Energy re-institute the previously typical timing of the behaviour work so that it begins no later than mid-July in 2009 and beyond.	SEIC	Immediate	
WGWAP-6/008	Item 5.3	The Panel <b>encourages</b> Gailey and colleagues to integrate all available information, including anthropogenic noise, into their full analysis of the 2008 data.	SEIC	April 2010	
WGWAP-6/009	Item 5.4	The Panel makes several <b>recommendations</b> related to the analysis, form of presentation and availability of Sakhalin Energy acoustic data. Firstly, spectrograms with clear and consistent depictions of received amplitude levels should be presented for all recorders, including real-time data from T-AUARs and the archival sonobuoys.	Sakhalin Energy	None specified	
WGWAP-6/010	Item 5.4	Secondly, these plots should present the acoustic data in a format described in a previous MNR report, specifically figure 1.8 in ‘WGWAP_13E_MNR_Report_Acoustics_Volume_1_2005.pdf’. Most importantly, frequency analysis should be in 1 Hz steps from 1-1000 Hz along a linear rather than logarithmic axis, time integration windows should be ≤1 min, and the plots showing composite received levels should be larger and more discernable.	Sakhalin Energy	None specified	
WGWAP-6/011	Item 5.4	Thirdly, all additional information on days and locations of interest relative to known industrial events should be made available for	Sakhalin Energy	None specified	

Recommendation number	Cross-Reference	WGWAP Recommendations & Requests	Responsible Party/Parties	Target Completion Date	Sakhalin Energy Response
		analysis.			
WGWAP-6/012	Item 5.4	Finally, all acoustic data should be archived in such a format that subsequent analyses using additional acoustic metrics (e.g. peak sound pressure, kurtosis) are possible.	Sakhalin Energy	None specified	
<b>Item 6: ACTIVITIES OF OTHER COMPANIES IN 2008</b>					
WGWAP-6/013	Item 6.4	The Panel <b>recommends</b> that Sakhalin Energy, IUCN and the Russian Ministry of Natural Resources (MNR) make a concerted effort to obtain all relevant information on activities by other companies during the 2008 field season.	Sakhalin Energy, IUCN, MNR, Rosprirodnadzor	As soon as feasible	
WGWAP-6/014	Item 6.4	The Panel <b>acknowledges</b> the efforts by IUCN to bring a representative from MNR to this meeting and <b>recommends</b> that the level of coordination and consultation between IUCN and MNR be expanded as feasible.	IUCN	As soon as feasible	
<b>Item 7: PHOTO-ID</b>					
WGWAP-6/015	Item 7.1	The Panel <b>recommends</b> that the cross-matching of the catalogues be updated annually.	Sakhalin Energy	April, annually	
WGWAP-6/016	Item 7.1	The Panel <b>recommends</b> that a population analysis based on the combined photo-ID data sets data should be conducted in time for WGWAP-7.	WGWAP	December 2009	
WGWAP-6/017	Item 7.1	The Panel <b>recommends</b> that the Task Force be continued, with the reduced list of remaining tasks identified in the pre-meeting workshop report, and that it should try to meet again in-person, preferably immediately prior to WGWAP-7.	Sakhalin Energy, WGWAP	December 2009	
WGWAP-6/018	Item 7.1	The Panel <b>requests</b> that the membership of the Task Force be specified soon after WGWAP-6.	Sakhalin Energy, WGWAP	June 2009	
WGWAP-6/019	Item 7.2	In view of the problems found by the Photo-ID Task Force with identifications of some mother-calf pairs, the Panel <b>recommends</b>	Photo-ID TF	Prior to December	

Recommendation number	Cross-Reference	WGWAP Recommendations & Requests	Responsible Party/Parties	Target Completion Date	Sakhalin Energy Response
		that the Task Force examine photos of this calf carefully to verify its status.		2009	
WGWAP-6/020	Item 7.2	The Panel <b>recommends</b> that data sets be assigned version numbers, and that a record of all retrospective changes to data be maintained.	Various	None specified	
<b>Item 8: MMO PROGRAMME AND CARCASS DETECTION</b>					
WGWAP-6/021	Item 8.1	The Panel <b>requests</b> that Sakhalin Energy prepare an analysis for WGWAP-7 that compares MMO observations across years, with emphasis on the crew change vessels	Sakhalin Energy	December 2009	
WGWAP-6/022	Item 8.4	The Panel <b>stresses</b> that given the time and other resources invested in documenting strandings such as this one, additional data and more photographs should be provided in reports such as WGWAP-6/21.	Sakhalin Energy	None specified	
<b>Item 10: OIL SPILL PREVENTION, PREPAREDNESS AND RESPONSE</b>					
WGWAP-6/023	Item 10	The OSRPs identify the need for monitoring but contain no details. They state that the details appear in two other Sakhalin Energy publications. The Panel <b>requests</b> that copies of these other documents be made available for review by the Environmental Monitoring Task Force.	Sakhalin Energy	1 July 2009	
WGWAP-6/024	Item 10	Given the importance of aromatic compounds in oil to the potential environmental impacts of a spill, the Panel <b>recommends</b> that Sakhalin Energy conduct further, more detailed analyses of the crude oil.	Sakhalin Energy	December 2009	
<b>Item 12: SAKHALIN ENERGY ACTIVITIES IN 2009</b>					
WGWAP-6/025	Item 12.1	The Panel <b>requests</b> that Sakhalin Energy report back at WGWAP-7 regarding the crew change vessel replacement process and any related efforts to improve collision avoidance procedures.	Sakhalin Energy	December 2009	
WGWAP-6/026	Item 12.2	In view of those concerns [need for better data on early-season occurrence of whales and data on distribution and behaviour in 2009	Sakhalin Energy		



Recommendation number	Cross-Reference	GWAP Recommendations & Requests	Responsible Party/Parties	Target Completion Date	Sakhalin Energy Response
		for comparison with 2008], the Panel <b>recommends</b> that a full complement of research and monitoring work be carried out in 2009, to include all elements of the programme as in previous years.			
<b>Item 14: EXPECTED ACTIVITIES OF OTHER COMPANIES IN 2009</b>					
GWAP-6/027	Item 14.4	The Panel <b>recommends</b> that Sakhalin Energy, IUCN, the Russian Ministry of Natural Resources, Rosprirodnazor and the Russian Group for Strategic Planning on Western Gray Whale Research increase their efforts to obtain all relevant information on activities by other companies planned for the 2010 field season and that this information be made available for panel consideration at GWAP-7 and GWAP-8.	Various	December 2009	
GWAP-6/028	Item 14.4	The Panel also <b>recommends</b> that IUCN collate and prepare graphic presentations of such information (e.g. one or more maps of areas of planned seismic surveys with indications of probable timing) as a routine contribution for each future panel meeting.	IUCN	GWAP meetings	

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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. Reporting procedures

### **2. 4-D seismic survey**

- 2.1. Update on survey plans
- 2.2. Review of status of gray whale mitigation and monitoring plans
- 2.3. Panel discussion and recommendations
- 2.4. Sakhalin Energy response

### **3. Progress on plans for satellite tagging**

### **4. Report on progress and planning by the Environmental Monitoring Task Force**

### **5. Results of 2008 distribution, behaviour, noise and benthic monitoring**

- 5.1. Results from Sakhalin Energy/ENL distribution monitoring programme
- 5.2. Results from observational effort by non-industry groups
- 5.3. Results from Sakhalin Energy/ENL whale behaviour monitoring programme
- 5.4. Results from Sakhalin Energy/ENL noise monitoring programme
- 5.5. Results from Sakhalin Energy/ENL benthic monitoring programme

### **6. Activities of other companies in 2008**

- 6.1. Seismic surveys
- 6.2. Pile driving
- 6.3. Other
- 6.4. Summary of efforts to obtain information
- 6.5. Synthesis of 2008 discussions: Panel conclusions

### **7. Photo-ID**

- 7.1. Progress report from Photo-ID Task Force
- 7.2. Results of IBM photo-ID of western gray whales in Sakhalin
- 7.3. Results of Russia-US photo-ID programme in 2008
- 7.4. Progress on update of population assessment

### **8. MMO programme and carcass detection**

- 8.1. 2008 MMO programme final report
- 8.2. Update on distribution of necropsy manual
- 8.3. Update on necropsy kit
- 8.4. Carcass survey report

### **9. Multivariate analysis (MVA)**

- 9.1. MVA of 2006 data – preliminary report
- 9.2. Update on progress with MVA workshop(s)

### **10. Oil spill prevention, preparedness and response**

- 10.1. OSRP review
- 10.2. Handbooks comparison
- 10.3. Review of Vityaz crude oil characteristics

- 10.4. Comparison with lenders' review of OSRP by PCCI
- 10.5. Application for pre-approval for dispersant use

**11. Progress on rangewide initiative**

**12. Sakhalin Energy activities in 2009**

- 12.1. Update concerning annual revision of Marine Mammal Protection Plan with details on planned human activities in 2009 open-water season
- 12.2. Review of joint Sakhalin Energy/ENL research and mitigation programme for 2009 apart from seismic-related

**13. Non-Sakhalin Energy groups monitoring**

- 13.1. Russia-US team plans for 2009
- 13.2. IFAW acoustics
- 13.3. Update on proposed Piltun Protected Area

**14. Expected activities of other companies in 2009**

- 14.1. Seismic surveys
- 14.2. Pile driving
- 14.3. Other
- 14.4. Summary of efforts to obtain information

**15. Review outstanding recommendations and requests, including update on cumulative online list**

**16. WGWAP evaluation for IUCN**

**17. Any other business**

**Annex 3. List of documents**

DOCUMENT NUMBER	SUBMITTED BY	TITLE	STATUS
WGWAP-6/1	IUCN	Provisional agenda (including time schedule) (English)	Public
WGWAP-6/2	IUCN	Provisional agenda (including time schedule) (Russian)	Public
WGWAP-6/3	IUCN	List of documents distributed in connection with the 6 <sup>th</sup> meeting of the WGWAP	Public
WGWAP-6/4	IUCN	Table of previous recommendations and outstanding requests for data or information	Public
WGWAP-6/5	SEIC	Final report on 2008 IBM photo-ID programme	Public
WGWAP-6/6	Cooke	Preliminary report on Photo-ID Task Force Meeting, 19–20 April 2009, Geneva	Public
WGWAP-6/7	Donovan	Final report of Seismic Survey Task Force Meeting, 31 Jan – 2 Feb 2009, Vancouver	Public
WGWAP-6/8		<i>No document</i>	
WGWAP-6/9	Dicks	Progress report on outstanding oil spill-related issues	Public
WGWAP-6/10		<i>No document</i>	
WGWAP-6/11	Tsidulko	Update report on Russia-US team research in 2008 ( <i>PP presentation</i> )	Public
WGWAP-6/12	SEIC	Final report on 2008 benthic monitoring programme	Public
WGWAP-6/13	SEIC	Final report on 2008 western gray whale behaviour monitoring programme	Public
WGWAP-6/14	SEIC	Final report on 2008 western gray whale distribution monitoring programme	Public
WGWAP-6/15	SEIC	Final report on 2008 noise monitoring programme	Public
WGWAP-6/16	SEIC	Final report on 2008 MMO programme	Public
WGWAP-6/17	SEIC	Marine Mammal Protection Plan for 2009 season	Public
WGWAP-6/18	SEIC	Preliminary report on MVA of 2006 data ( <i>PP presentation</i> )	Confidential
WGWAP-6/19		<i>No document</i>	
WGWAP-6/20	Turner	Report of biennial WGWAP evaluation ( <i>PP presentation</i> )	Public
WGWAP-6/21	SEIC	Carcass Survey report 2008	Public
WGWAP-6/22	SEIC	Seismic Survey EIA	Public