

**WESTERN GRAY WHALE ADVISORY PANEL**  
**1st Meeting**

**WGWAP 1/Report**  
**9-11 November 2006**  
**Prangins, Switzerland**

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

**CONVENED BY IUCN - THE WORLD CONSERVATION UNION**

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## 1 INTRODUCTION

The first meeting of the Western Gray Whale Advisory Panel (WGWAP) was held at Hotel La Barcarolle, Prangins, Switzerland, from 9-11 November 2006 under the chairmanship of R.R. Reeves.

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

- Sakhalin Energy Investment Company Ltd
- The World Conservation Union - IUCN
- WWF – Russia
- WWF – UK
- European Bank for Reconstruction and Development
- Export Import Bank
- UK Export Credits Guarantee Dept.

At the request of the Panel, David Weller participated in the meeting as an Associate Scientist.

### 1.1 Background

IUCN has been engaged on the issue of Western Gray Whale (WGW) conservation for more than two years. In that time, IUCN has convened two previous scientific panels to advise Sakhalin Energy Investment Company Ltd (hereafter Sakhalin Energy) with regard to WGW conservation and research.

The Independent Scientific Review Panel (ISRP) was convened in 2004 and met four times before completing its report, which was published by IUCN in February 2005. [<http://www.iucn.org/themes/marine/sakhalin/isrp/index.htm>.] Subsequently, IUCN convened a follow-up workshop (the Gland Workshop) to provide Sakhalin Energy with feedback on their response to the ISRP Report and to contribute to the potential international lenders' understanding of that response. [[http://www.iucn.org/themes/marine/sakhalin/ISRP\\_Followup/index.htm](http://www.iucn.org/themes/marine/sakhalin/ISRP_Followup/index.htm)]

One of the main recommendations of the Gland workshop was the establishment of a long-term scientific advisory panel. In September 2005, at the request of the potential international lenders for the Sakhalin-II project, a third meeting was convened in Vancouver (the Lenders' Workshop). At that time, some of the issues raised in the ISRP report were judged as resolved or moot, but numerous others were deferred for further consideration and resolution by a planned long-term advisory body, the Western Gray Whale Advisory Panel (WGWAP). Following the Lenders' Workshop, IUCN received and agreed to a request by Sakhalin Energy to convene the WGWAP.

When it became evident that the WGWAP was not going to be established in time to review Sakhalin Energy's plans for gray whale protection and monitoring during the 2006 construction season, IUCN decided to convene the Interim Independent Scientists Group (IISG) to bridge the gap. The IISG Workshop was held on 3-5 April 2006 in Vancouver. [[http://www.iucn.org/themes/marine/sakhalin/ISRP\\_Followup/IISG%20April%2006.htm](http://www.iucn.org/themes/marine/sakhalin/ISRP_Followup/IISG%20April%2006.htm)]. At that meeting, the IISG concluded that the *modus operandi* of the WGWAP should shift from the reactive or review-only approach of the previous panels, to a more proactive approach. This would mean that the deliberations and meetings of the WGWAP would be timed and organized to allow the Panel not only to assess, comment on and

develop recommendations from documents produced by Sakhalin Energy and other participating companies, but also to prescribe the types of research and monitoring needed for adequate WGW protection.

IUCN finally established the WGWAP on 2 October 2006. The panel is convened for an initial period of five years, with the possibility of extension. The WGWAP Terms of Reference can be found on the IUCN website [[http://www.iucn.org/themes/marine/sakhalin/ISRP\\_Followup/WGWAP.htm](http://www.iucn.org/themes/marine/sakhalin/ISRP_Followup/WGWAP.htm)].

## 2 ADOPTION OF AGENDA AND REPORTING PROCEDURES

The provisional agenda was adopted without major changes or additions (Annex 2). It was understood that the Panel's work on the meeting report would take place during the time available at the end of each day's plenary session and the afternoon/evening of Day 3.

## 3 SAKHALIN ENERGY MID- TO LONG- TERM WORK PLAN

Shifting the focus of the WGWAP from reactive to proactive requires that the Panel be informed of Sakhalin Energy's construction, operations, research and monitoring schedules as far in advance as possible. Ideally, this should include decision-making and not just implementation. Also, it should be in the form of a timeline for ease of comprehension. Such information is needed to anticipate the various elements of upcoming events, identify potential risks, conduct research essential to provide baseline information, and identify management measures to avoid, minimize, or mitigate the risks early enough for incorporation into company planning. Andrew Pearce, Sakhalin Energy's General Manager of Health, Safety, Environment and Security, presented the company's general work plans for the coming two years, which will be a time of considerable transition as the PA-B platform construction is completed, pipelines are hooked up and prepared for oil and gas transport, and oil spill prevention and response planning and measures are completed and put into place. Although that information is very useful to the Panel for mid-term planning, it is not sufficient for long-term planning.

With that in mind, the Panel **requests** that Sakhalin Energy prepare a schedule of its work for at least the next five years – this should include the construction and operations schedule, the research and monitoring plans and the times when decisions will be taken. As well as confirmed activities, it should indicate all anticipated or likely events, such as seismic testing. In addition, the Panel **requests** that Sakhalin Energy establish a standard practice of keeping it informed of its plans, through IUCN, without the Panel having to request such information repeatedly.

## 4 ANNUAL POPULATION ASSESSMENT

### 4.1 Annual assessment of WGW “biological and demographic state”

The ISRP report contained a population assessment using field data up to and including the 2003 season (Reeves *et al.* 2005). A preliminary update to that assessment, using field data from the Russia-USA team up to and including the 2005 season, was presented at the IISG meeting. The results were submitted to the IWC Scientific Committee in June 2006 (IWC document SC/58/BRG 30) and included in the documentation for this meeting (WGWAP 1/INF.7). They are intended to be submitted for publication.

The 2006 assessment is somewhat more optimistic than the previous one. The estimate of population size in 2006, excluding calves, is 122 whales (confidence limits 113-131). The revised population estimate for 2004 is 114 whales; the increase in population estimate indicates an increase in the population during 2004-2006 (from 114 to 122) *and* reflects an upward revision of the estimate of the 2004 population size (from 101 to 114).

In the absence of additional mortality, the population is projected to increase at a rate of 2-4% per year. However, three females (one mother with calf, plus one suspected yearling) died after being caught in nets in Japan in 2005. If this level of annual mortality continues, the population is projected to decline towards extinction. The Panel notes that the IWC Scientific Committee has welcomed initial administrative steps taken by the Japanese authorities to avoid mortality of gray whales in nets, recommended development of additional preventative measures, and requested information on further steps to be taken to address this problem (see WGWAP 1/INF.25). However, it is important to note that Japan still has not made photographs or tissue samples from the whales that died in 2005 available for matching with photographs of and genetic information on whales from the Sakhalin feeding grounds. The Panel encourages this cooperative work to be undertaken as soon as possible. No deaths of western gray whales have yet been reported in 2006.

The evidence to date suggests that the population assessments using the Sakhalin Shelf data represent the whole population. In some years, gray whales have been photographed opportunistically off southern Kamchatka and a number of matches have been made to both males and females in the Sakhalin Shelf catalogue. There has been speculation that some of the whales seen off southern Kamchatka might be from the eastern gray whale population, but there is no evidence for this to date.

The more optimistic assessment in 2006 is due primarily to improved calf production during 2003-05 compared to previous years, with the average calving interval decreasing from 3-4 years to 2-3 years. Calf production (as used here) is a measure of the number of calves that are born and survive long enough to migrate to the summer feeding grounds. The precise factors determining production are not well understood but probably include:

- (0) the condition of females and availability of prey to the mothers in the preceding summer;
- (0) feeding conditions two summers previously, in that these may affect the condition of females on the breeding grounds and the subsequent northern migration and hence the proportion of them that become pregnant and maintain pregnancy.

The increase in population estimate is due only in part to an apparent increase in the population, and in part to an upward revision of the estimates for the same years (note the uncertainty of approx.  $\pm 10\%$  in the estimates). The apparent population increase is primarily due to the good calf production in 2003-05, which may reflect good feeding conditions during 2001-04, when there was relatively little industrial activity (apart from the seismic survey carried out for Exxon in the northern part of the near-shore feeding area in 2001). Because of the time lag involved, it would be incorrect to conclude that the more optimistic population assessment implies that recent industrial activities have had no adverse effects.

In general, the Panel cautions against overly optimistic or overly pessimistic interpretations of the model results, based on only one or a few years of new data. Clearly the population is

in a critical state and this will remain true for many years even under the most optimistic scenarios. Given the nature of whale population dynamics and our ability to estimate abundance, the detection of significant trends in population size will require several more years of data, except, perhaps, in the case of a catastrophic decline. Hence the importance of a commitment to long-term monitoring.

Observed calf production in 2006 was disappointingly low, with no more than 4 calves observed by any of the research teams. However, the field season was hampered by poor weather, which led to reduced survey effort. The number of calves observed by the Russia-USA research team since 1998 (Weller *et al.* 2006) have ranged from 3 to 11 per year (1998: 8; 1999: 3; 2000: 3; 2001: 6; 2002: 7; 2003: 11; 2004: 7; 2005: 6).

#### 4.2 Discussion and agreement on assessment methods and plans

During the meeting, Sakhalin Energy reported that it had no plans to contract for a population assessment based on the Institute of Marine Biology photo-identification dataset alone, because the time series (from 2002 onwards) is too short.

The Panel agrees that, in principle, the population assessment could be improved by combining all available photo-identification data, including those maintained at the Institute of Marine Biology (Vladivostok) along with those of the Russia-USA team (from 1994 onwards). Use of a combined dataset is contingent on cross-matching of the datasets as described under item 5, and will therefore not be possible until later in 2007, after the spring 2007 Panel meeting. The initial 2007 assessment will therefore be based on the Russia-USA data only, but could be updated later in the year when a combined dataset becomes available.

Additional issues for subsequent population assessments include:

- ( ) Examination of the relationship between “skinny whales” and reproductive success and survival. To date, body condition has been described using partly subjective visual assessments that differ somewhat between research teams. An objective measure of condition, determined from analysis of photographs and video, has recently been developed by the Russia-USA team. This measure has been integrated into their database and will allow the integration of information on condition into the population model.
- ( ) Examination of individual differences in reproductive rates (including the relationship with condition). The issue of individual heterogeneity also was raised during the IWC Scientific Committee’s review of the population assessment (WGWAP 1/INF. 23).
- ( ) Integration of the demographic data with the distributional and behavioural data to estimate the demographic impact of the apparent shifts in distribution and behaviour associated with industrial activity (see item 6, below). This will require more detailed specification of the distributional and behavioural data to be included in such an analysis.

The Panel **recommends** that from this year onwards, certain simple statistics from photo-identification studies be reported by Sakhalin Energy as routine information after each field season, including: field effort, number of different whales sighted and identified, number of identified females and males sighted, number of calves, number of ‘new’ whales, number

of mother-calf pairs, number of skinny whales, and any known deaths. The Panel also looks forward to receiving the detailed analysis of the 'skinny' whale issue being undertaken by the Russia-USA team, incorporating the objective photographic approach described under (a) above.

## 5 PHOTOGRAPHIC AND GENETIC IDENTIFICATION OF WESTERN GRAY WHALES

Photographic and genetic data for individual identification represent the single most important data source for the assessment of western gray whales. The value of such data in obtaining *inter alia* estimates of abundance and other population parameters and in elucidating social structure and movements is well known. At present there are two groups working on photo-identification of western gray whales: the Russia-USA programme that has been working since 1997; and the Institute of Marine Biology (Vladivostok) group that has been working with the industry (Sakhalin Energy and Exxon Mobil) since 2002. The Panel was pleased to receive the publicly available CD of the catalogue<sup>1</sup> of the Russia-USA programme and the news that the catalogue of the Institute of Biology programme would soon become available.

Experience from around the world has shown that results from the collaboration of groups working with photo-identification (and genetic) data are of considerably greater value than simply the sum of the results from the individual groups working alone. In addition to enhancing the scientific value of the studies, for such a small critically endangered population as that of western gray whales, collaborative studies also provide the opportunity to minimise the disturbance to whales caused by research boats. For a variety of reasons, relatively little progress has been made thus far in comparing the two WGW catalogues.

The need to ensure consistency in how identifications of individuals are made (e.g. determination of new individuals vs. resightings) has long been recognised and both the IISG and the IWC Scientific Committee have recommended that the two WGW research groups compare photographs and catalogues – ideally resulting in a virtual or actual agreed catalogue and database of resightings with the appropriate safeguards for data holders. Similar exercises have been successful in several areas of the world involving many more research groups (e.g. the North Atlantic humpback whale catalogue and the Europhlukes project). The IISG report noted that there were significant inconsistencies between the two catalogues and made a number of recommendations<sup>2</sup> for their future integration. It recognized that combining these data sets, after they have passed through appropriate quality control procedures, would enable more precise and accurate estimation of population characteristics and hence quicker detection of possible negative trends. Equally important is that duplication of field effort potentially exposes the whales to unnecessary disturbance from research. Therefore integration, in addition to enhancing population monitoring, would be expected to reduce duplication of field efforts and minimise disturbance to the whales.

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<sup>1</sup> By catalogue here, we mean the reference set of photographs (best) for each individual. This differs from a database that includes the complete sightings history for each individual along with the photograph(s) used for each agreed resighting and the quality of those photographs.

<sup>2</sup> See page 5 of the IISG report.

In view of those considerations, the Panel is pleased that the relevant parties have agreed to the terms of reference for a Task Force, to be chaired by Cooke and Donovan (Annex 4). The Panel believes that the successful outcome of the work of the Task Force will play an important role in improving advice on the conservation of western gray whales.

## 6 MULTIVARIATE ANALYSIS

At its April 2006 meeting, the IISG discussed a study by Gailey *et al.* of the potential effects of 2005 construction activities on WGWs. In the authors' presentation of that study they concluded, *inter alia*, that no detectable effects on whale behaviour or distribution had occurred. However, they properly acknowledged that that finding had been based on univariate analyses that did not incorporate data on environmental factors including underwater sound from the construction activities. Accordingly, the IISG considered the no-effects result to be inconclusive and deferred any judgement until a more detailed multivariate analysis, incorporating data on noise and other environmental parameters, had been completed.

In preparation for the present meeting, the Panel considered two documents on this topic. The first (WGWAP 1/INF.1) presented the preliminary results of the multivariate analysis undertaken by Gailey *et al.* on data from the 2005 construction season. The second (WGWAP 1/INF.2) summarized a technical review of that same preliminary multivariate analysis by Gailey *et al.* The review had been commissioned by AEAT, a consultant for the potential lenders, and had taken place in the summer of 2006. The final analysis by Gailey *et al.* is expected to be completed this winter.

The analysis in document WGWAP 1/INF.1 focussed on whale behaviour, including data on surface-dive-respiration parameters, movement patterns and overall distribution and numbers, in relation to modelled estimates of sound levels produced by construction activities during installation of the PA-B platform's concrete gravity-based structure (CGBS). The analysis was intended to contrast whale behaviour before, during and after the CGBS construction period. However, the authors acknowledged that limited data were collected during the pre-construction period and no behavioural data were collected (due to weather) during two of the four phases of construction – tow-in and positioning of the CGBS. Unfortunately, these are the two loudest phases of construction. Thus, the analysis pertains only to the anchor installation and scour protection phases of the construction period. In addition, most of the behavioural and distributional data were limited to whales within 2-3 km of shore (i.e., 9-10 km inshore of the CGBS), undermining the probability that effects on whales farther offshore would be detected if such effects occurred. Gailey advised the Panel that the information in document WGWAP 1/INF.2 would be taken into account in the final report of this study, but that, after a telephone-link discussion with the reviewers, recommended changes to the underlying statistical models would not be made. This is unfortunate because it indicates that the analytical shortcomings of the report will not be fully addressed and these important, although limited, data will not be as thoroughly explored as they might be, an important element of multivariate analysis (see below).

In spite of its shortcomings, the analysis suggests possible effects. The strongest apparent effect was displacement of whales offshore during periods of higher noise. The ramifications of seaward displacement are unknown but may include effects on foraging efficiency or, conceivably, increased exposure to predators or offshore vessel traffic. Such potential effects may be particularly significant for mother-calf pairs that otherwise limit their movement patterns to the near-shore environment.



Another apparent effect was a change in diving behaviour: dives increased in length with decreasing distance to the CGBS location. Although there are multiple possible explanations for such an observation, the time spent diving may be an indicator of foraging effort or success and should be explored more carefully. In this case, the Panel **suggests** that reanalysis based on percent of total time below the surface would be a useful follow-up to assess possible changes in foraging effort.

In view of the endangered status of this population, the observed offshore displacement, change in diving pattern, and other potential effects warrant additional scrutiny and follow-up. Points to consider include the following:

- (1) From a conservation perspective, the objective of the study was to test the null hypothesis that construction noise and associated activities have no impact on the population. The observation of apparent effects on individuals (e.g. offshore displacement) suggests that a population impact may occur and this possibility should be investigated further rather than being dismissed as insignificant.
- (2) The study would benefit from an exploration of the relationships among the predictor variables and among the response variables. For example, response variables may be related, given that they depend on the behaviour of an animal (e.g. an animal that is travelling at greater speed spends more time at the surface and moves in a more nearly constant direction). Such possibilities should be explored to provide the best possible understanding of the relationships among the different variables and the most appropriate form of the predictor and response variables. Principal components analysis is one way to examine these relationships and is often used as a preliminary step to explore the data before hypothesis testing is initiated.
- (3) The ‘subjects’ of the research also warrant reconsideration. In the analysis considered at the meeting, the authors had chosen to pool data for mother-calf pairs and single-whale groups. Unfortunately, this adds a confounding discontinuity in the subject pool because mother-calf pairs behave differently from single whales. Such pooling should always be preceded by comparison of the behaviour of the groups under consideration to confirm their homogeneity before pooling. Homogeneity is highly unlikely given the different distributions and behaviours of the two types of group.
- (4) The results were confounded by extraneous variables, most notably vessel noise from watercraft used for research purposes (photo-id). In future studies, greater effort should be made to avoid the confounding effects of such variables either by eliminating them as part of the research design or developing analytical methods to remove their influence on the analysis. It is also worth noting that this finding provides a clear basis to recommend that duplication of photo-identification research effort be avoided in the future.
- (5) The use of variables that are more-or-less arbitrarily determined (e.g. noise exposure over a 10-minute period) also should be examined to determine the potential effect of the chosen time period on the results. For example, in the case where distance offshore is the response variable, an implicit assumption of using 10-minute noise exposure as an explanatory variable is that whales would move back towards shore during a 10-minute lull in the noise. This assumption is not

realistic; it may take much longer for the distribution of whales to return to normal. Use of the 10-minute interval as the explanatory variable could, therefore, seriously underestimate the true effect of noise.

- (0) Finally, during previous reviews of Sakhalin Energy's activities and evaluations of the potential effects of construction noise, the panels have repeatedly indicated that noise level alone may not be the most relevant or the only indicator of the influence of noise on the whales. The analysis apparently did not take into account the total noise energy exposure, duration of exposure, frequency and bandwidth of the noise, amount of variation in noise levels over time, occurrence of noise spikes, etc. In particular, the timescale involved in the whales' response to a stimulus (e.g. movement offshore) and in the subsequent decay of the response (e.g. movement back towards shore) needs to be considered explicitly in an analysis. This and other aspects of the noise exposure ought to be considered and explored before reaching firm conclusions about potential effects.

The Panel commends Gailey and his co-investigators for progress on the multivariate analysis. They have developed a useful tool for investigating an issue that has been a major source of concern. As is usually the case with such complex analyses, however, the Panel believes more refinement is necessary before reliable conclusions can be drawn regarding the effects of the 2005 construction activities on the behaviour and distribution of gray whales.

The shortcomings of the analysis were in part a function of the study design and implementation. It is disappointing that adequate baseline (pre-exposure) data were not collected and that behavioural data were not collected during the tow-in and positioning phases of the CGBS installation. At this meeting (and see item 7 below), Sakhalin Energy informed the Panel that again in 2006, the company had faced a choice between (a) delaying construction activities and collecting adequate baseline information, with the attendant risk that construction would not be completed in that season and further work would be required in 2007, and (b) initiating construction without observers in place. Sakhalin Energy noted that its decision had been based, at least in part, on its interpretation that one aspect of the IISG's advice (i.e. that work should start as early in the season as possible) took precedence over another (i.e. that collection of baseline data should occur). The Sakhalin Energy decision in 2006 now means that those data will suffer some of the same inadequacies as suffered by the 2005 data. Although the Panel understands that logistics in this region are difficult, it also believes that a stronger effort should have been made to initiate whale observations at least in synchrony with construction activities in 2006

A multivariate analysis of the kind performed is a reasonable means of identifying explanatory and response variables that might be important. An actual quantification of the response requires the development of a model of whale response and fitting it to the data. The analysis performed shows that movement of whales offshore is a likely response to noise, but it is insufficient for quantifying the extent of movement.

The Panel **recommends** that:

- 0) The above 'points to consider' be taken into account in the final report on the multivariate analysis of 2005 data.

- 0) In the final report, and in any other outlet citing its findings (e.g. on Sakhalin Energy's website), the study's limits, as outlined above e.g. in relation to the lack of baseline (pre-disturbance) behavioural data and the failure to collect behavioural data during the two loudest phases of the construction activity, be clearly acknowledged. It should not be claimed that the extent of the whales' response to noise, such as movement offshore, has been quantified.
- 0) The foregoing concerns and suggestions be considered in analyses of effects using 2006 data and also in the planning and decision-making process for data collection and analysis in 2007.

## 7 MONITORING WHALE BEHAVIOUR AND INDUSTRIAL NOISE

Issues surrounding the question of whether, and to what extent, the noise from oil- and gas-related activities is having detrimental effects on the behaviour or health of WGWs have figured prominently in the work of previous panels, starting with the ISRP. The noisiest construction activities associated with platform installation for Sakhalin-II Phase 2 are past, as are most of those for pipe-laying. Therefore, analysis of the data on whale distribution, movements, activity and behaviour in relation to concurrent data on underwater construction-related sound should be a major focus in the next few months. Only through rigorous analyses of such data will it be possible to judge whether measurable effects on the whales have occurred. This will help determine whether the mitigation measures employed by Sakhalin Energy have been effective in protecting the whale population and, importantly, inform future efforts aimed at protecting gray (and other) whales from the harmful effects of anthropogenic underwater sound.

A major part of Sakhalin Energy's monitoring programme during the 2006 construction season was dedicated to examining potential impacts on WGWs from activities associated with pipeline installation. Following the advice provided in the IISG and other previous panel reports, Sakhalin Energy conducted acoustic monitoring using real-time transmission of acoustic data from sonobuoys located along the edge of the feeding area. Three teams of observers collecting data on behaviour throughout the season, two north of the Piltun Lagoon mouth and a third south of the mouth in the area of the pipeline landfall. The latter team was expected primarily to observe whales as they migrated north towards the near-shore feeding area. In addition, experienced marine mammal observers (MMOs) were present on the construction vessels operating close to the landfall to scan the area for whales. In spite of the above described effort, the Panel could not evaluate whether noise exposure affected WGWs in 2006 because acoustic or behavioural data were not provided and the distribution data presented to the panel were not corrected for effort. As reported by Sakhalin Energy (A. Pearce), the actual start date of construction was 12 June 2006, the first visual observations occurred during the week of 17-24 June, and the first acoustic monitoring buoys were deployed on 22 June with the first real-time acoustic data being received on 3 July. The IISG had recommended that Sakhalin Energy begin construction in 2006 on the earliest day possible *and* that shore-based observations of behaviour and distribution should begin at the same time, or preferably prior to, the start of construction activities.

Although the first of those recommendations was followed, the second was not. As in 2005, Sakhalin Energy began construction as early as feasible given seasonal conditions, the intention being to complete as much construction as possible before the end of the open-water season. However, Sakhalin Energy chose not to initiate monitoring at the same time,

in spite of the fact that the IISG emphasized the importance of obtaining data on whale behaviour and distribution for the pre-construction period. Without such baseline data, analyses are less likely to detect potentially significant effects if they occur. The Panel was advised that the observation teams had been unable to reach their observation stations due to road conditions, but it questioned why other means (e.g., helicopters) had not been used to transport the teams to their study sites. Furthermore, it is not clear why acoustic recording buoys were not deployed and real-time acoustic data received until 10 and 21 days, respectively, after construction was initiated in the same area. In addition, once real-time acoustic monitoring was initiated, the criteria used to initiate mitigation measures were not fully consistent with IISG recommendations (see below).

### 7.1 Distribution of whales relative to noise-generating activities

To monitor whale distribution in close to real time and thereby provide a basis for initiating remedial actions when needed, the IISG recommended that:

*Distribution data should be analyzed as quickly as possible during the 2006 season so as to detect potential changes in WGW distribution in response to noise from Sakhalin Energy activities.*

The information provided to the Panel prior to and at this meeting indicated that such real-time monitoring had not been accomplished. According to a PowerPoint presentation by Sakhalin Energy, preliminary information regarding the distribution of whales within northern, central and southern near-shore blocks, based on scans converted to density distributions, suggested that more whales remained in the southern block than would have been expected on the basis of historical data. However, the crude nature of the analysis presented, without appropriate documentation, precludes reliable conclusions or inferences. The Panel **recommends** that it be provided with a full analysis using effort-corrected data on distribution, for each year that such data are available, overlaid onto the appropriate acoustic ‘footprint’ information. The results should be integrated to produce an appropriate multi-year comparison of distribution, particularly for years with and without significant anthropogenic noise.

### 7.2 Exposure criteria

At the IISG meeting earlier this year, Sakhalin Energy presented data showing ensonification during the 2005 season of ~15% of the feeding ground at levels in excess of 120 dB re 1  $\mu$ Pa. This was judged by the company to be within acceptable bounds given that their criteria were based on the total number of whales potentially exposed to levels >120 dB. The IISG (as had the ISRP previously) disagreed with the Sakhalin Energy criteria for several reasons, so the IISG was very clear about its recommendations concerning ‘acceptable’ exposure and the measurement of noise.

In its report, the IISG recommended that Sakhalin Energy use a set of five criteria based on levels of noise received at the seaward edge of the near-shore (Piltun) feeding area for triggering mitigation measures to control the exposure of gray whales to noise. Sakhalin Energy accepted (and presumably implemented in 2006) all but the first of those five criteria, which was that corrective actions should be triggered by continuous received levels at monitoring buoy(s) in excess of 120 dB re 1  $\mu$ Pa for four hours. The limited data available on behavioural reactions of feeding gray whales to noise indicate that they begin to respond to continuous noise at levels below 120 dB re 1  $\mu$ Pa. Indeed, Malme and colleagues observed that 50% of gray whales in their study responded to noise at 120 dB re 1  $\mu$ Pa (Malme *et al.*

1986, 1988). These are the only data available for feeding gray whales exposed to continuous noise of the type produced by the Sakhalin Energy construction activities, and thus they provide the best basis for assigning a noise threshold to trigger mitigation. Although Sakhalin Energy has recognized 120 dB as a threshold for reactions by the whales to industrial noise, some unknown number of whales was potentially exposed to noise in excess of 120 dB for nearly 2 days in 2005. As stated above, the IISG recommended that prolonged exposure (exceeding 4 hours) to noise levels above 120 dB, i.e. exceeding the level currently considered to be near the response threshold for this species, should be avoided. The IISG felt that duration of exposure should be taken into account in a more detailed way.

For the 2006 season, the IISG recommended an energy-based exposure scale based on sound intensity level and duration of exposure. Permitted exposure levels (PEL) were determined using the following equation, where the value of parameter Q is set to 5:

$PEL (dB) = 130 - Q/3 * 10 \log_{10} (T / 60)$ , where T is exposure time in minutes.

Minutes (T)	Criterion Level (PEL)
15	140
30	135
60	130
120	125
240	120

Sakhalin Energy did not follow the IISG recommendation and instead used the ‘equal-energy rule’ with Q=3 (WGWAP 1/INF.28).

Minutes (T)	Criterion Level (PEL)
15	136
30	133
60	130
120	127
240	124
480	121
600	120

Use of the ‘equal-energy’ rule (Q=3) is contraindicated by recent scientific research on marine mammals (Kastak *et al.*, 2005). Its use as a criterion for real-time acoustic

monitoring is not a precautionary approach because it means that gray whales could be exposed for up to ten hours to noise levels exceeding 120 dB, without triggering any mitigation measures. Q values lower than 5 either violate the criteria accepted earlier (2005) or unreasonably exceed the acceptable noise dose. For these reasons, the Panel **recommends** that noise exposure criteria developed in the IISG report and intended for application in the 2006 construction season be followed during the 2007 season and thereafter unless, during the interim, sound exposures below the recommended thresholds are found to result in unexpected adverse effects. In addition, the Panel **requests** that the following information be provided, well in advance of its next meeting:

- (0) all acoustic data from buoys at the edge of and inside the Piltun feeding area, reported in standard formats, e.g. dB re 1  $\mu$ Pa RMS levels for 1-minute intervals;
- (0) actual day-by-day activities for each vessel involved in the June-August 2006 construction work;
- (0) data on whale distribution for 2006, corrected for effort, analyzed with respect to noise levels, and compared to appropriate historical data (as explained above);
- (0) an analysis of the relationship between the 2006 acoustic data and concurrent behavioural observations.

### 7.3 Monitoring Activities by Independent Groups

During the 2006 construction season two independent groups were involved in monitoring underwater noise and WGW behaviour in relation to industrial activities in the region. One group, sponsored by International Fund for Animal Welfare (IFAW) and involving Panel members Vedenev and Tsidulko, deployed sonobuoys on the nearshore WGW feeding area for a 2-week period in July. Among the objectives of this effort was to obtain 'real time' acoustic data for integration with data on whale behaviour and distribution collected by the other group, sponsored by WWF-Russia (WGWAP 1/INF.5). Vedenev gave a brief presentation on the IFAW acoustics work and Spiridonov made a brief introduction of WGWAP 1/INF.5 which described the shore-based observational work.

The Panel recognises the potential value of having such independent groups in the field, for at least three reasons. Firstly, their presence on-site provides a means of checking to ensure that the various companies and contractors operating in the region comply with stated rules, plans, policies and practices. The above information concerning timing of the start of Sakhalin-II Phase 2 construction work and the start of industry-sponsored monitoring in 2006 provides an example.

Secondly, as explained in Vedenev's presentation at the meeting, where he showed the capabilities of his acoustic monitoring system, field efforts by independent groups can demonstrate or test alternative technical and methodological approaches to research and monitoring. This may have a positive effect on work sponsored by the oil and gas companies and help to ensure that the equipment and procedures used for that work are truly 'state of the art' and meet the highest possible standards. For example, Vedenev's satellite-linked acoustic buoys are deployed and retrieved using a sailing ship (that remains outside of the feeding area) and a small (3 m) inflatable boat, whereas Sakhalin Energy's heavier (> 100 kg) buoys require a larger, noisier ship (that must move onto the feeding area) and larger (5 m) inflatable boat for deployment and retrieval. Finally, data and results

obtained by independent groups have the potential to supplement (or verify) those obtained by industry-sponsored researchers. This, however, requires that the data are of sufficiently high quality, that units of observation are clearly and consistently defined and that appropriate analyses are carried out to allow meaningful comparisons.

Importantly, the Panel **emphasises** its concern about one major drawback of having multiple research and monitoring teams in the field, which is that it can add to the disturbance from vessel noise or vessel presence on and near the feeding grounds. Therefore, any encouragement of independent initiatives must carry a caveat – that due consideration be given to this concern and that every effort is made to avoid or minimise additional disturbance to the whales. It is therefore important that the Panel be given the chance to review and provide detailed comments on any such proposed work, in the same way as it reviews SEIC proposals, to help ensure quality control and comparability of results.

## **8 IMPLEMENTATION OF CARCASS DETECTION/SALVAGE PROGRAM**

Previous reviews have noted the importance of detecting dead (or injured) gray whales on or near the coast of Sakhalin Island and recommended active efforts to find and investigate whale carcasses and to document ship strike injuries or scars through photography. The report of the Lenders' Workshop called specifically for biweekly surveys to search for injured or dead whales (either floating or on the beach) and for plans to evaluate and examine any such animals or carcasses to determine the circumstances surrounding their injury or death and to obtain biological data.

The IISG reiterated earlier conclusions that reliance solely on Marine Mammal Observers (MMOs), research teams involved in their normal tasks and other casual observers to detect and report gray whale carcasses was insufficient. A regular surveillance program, employing dedicated (or semi-dedicated, e.g. a helicopter returning from an unrelated crew change, reconnaissance, or supply mission) boats, aircraft, or both, is required.

During the 2006 season, Sakhalin Energy used existing infrastructure to initiate its programme of actively attempting to detect and investigate stranded cetaceans along the coast of Sakhalin Island (WGWAP 1/INF.10). Routine helicopter flights for personnel transfers were carried out daily (good weather only). The flight crews were briefed by a marine mammal expert (V. Latyshev) and asked to adjust their routing and procedures on the first flight each day so that they could search the shoreline for stranded animals. In the 2006 season from 17 July to 20 October, a total of 52 flights between Nogliki and the Piltun area and 43 between Nogliki and the Lunskeye area were included in the surveillance programme. Two stranded whales were detected by the helicopter crews, a Baird's beaked whale and a minke whale. Although detailed necropsies and sampling were not undertaken, as recommended for cases of stranded WGWs, some measurements and photographs were obtained and these were provided to IUCN and panel members. In none of these cases was the cause of death determined.

Sakhalin Energy has committed to the development of a more comprehensive strategy for routine observation flights for the 2007 construction season and onwards.

The crew change flights are conducted at altitudes between 300 m (minimum safe flying conditions) and 450 m (preferred if weather and safety concerns permit). Surveys for beached carcasses are more likely to be effective at altitudes lower than 450 m. However,

flying at lower levels generally introduces more sound energy into the near-shore habitat and therefore is more likely to cause disturbance to the whales there. The Panel **agreed** that it would review this issue and provide Sakhalin Energy with a recommended minimum altitude and distance from the shore, for these types of surveys prior to the 2007 construction season.

Coverage in 2006 was opportunistic and coastal areas north of the mouth of Piltun Lagoon were not covered at all even though these northern areas were included within the scope of coverage as recommended by the IISG. The Panel **recommends** that the northern areas be surveyed by helicopter monthly during the open-water season. Although these areas may be searched by research groups as they move into and out of the region, ground vehicles are not sufficient for complete coverage because the beach zone is not always visible from the road.

The Panel **endorses** the relatively detailed protocols and advice given in the IISG report under the heading 'Carcass Detection, Salvage and Necropsy'. It also **recommends** that as a minimal response to the finding of a gray whale carcass, Sakhalin Energy make sure that it is photographed promptly and that IUCN is notified by phone or e-mail as soon as possible. Then, based on the condition of the carcass (as inferred from the photographs), the Panel will make recommendations concerning what materials should be collected etc.

## 9 DNA AND OTHER BIOLOGICAL SAMPLING

In terms of DNA and other biological sampling, the Panel refers Sakhalin Energy to the IISG report where detailed advice was provided. Here, it **recommends** that a tissue sample (preferably skin or bone) be collected as soon as possible if any carcass of a baleen whale is found and there is any possibility that it could be a gray whale.

## 10 SATELLITE TAGGING

Little is known about the migratory routes and breeding areas of western gray whales. However, it is recognised that activities on the feeding grounds are only one source of potential anthropogenic threats to their survival. This has been emphasised in recent years by deaths due to entanglement in fishing gear in Japan and which may occur in other parts of the population's range. In addition, the ISRP report expressed concern over the potential for ship strikes in the spring and autumn migratory corridor(s) near Sakhalin and northern Japan; again this threat likely also exists elsewhere in the population's range.

The possibility of using satellite tags to obtain information on gray whales in other parts of their range (and specifically to assist in developing appropriate mitigation measures) has been discussed for some years. When first discussed in the IWC Scientific Committee, it was recognised that the potential risks to the animals from the tagging process needed to be weighed against the potential benefits of the results of such a study. Given the critically endangered status of the population, it was agreed that before any such attempts were made, the process should be tested on gray whales from the relatively large eastern population. At its last meeting, the IWC Scientific Committee reviewed the results of telemetry work carried out on eastern gray whales by B. Mate in Mexico. As a result of its discussions, the that committee recommended that telemetry work be undertaken provided that it be carried out by experienced investigators (e.g. Mate) using proven techniques and that tags are only applied to known males (WGWAP 1/INF.23).



The Panel considered this information and also noted that similar tagging work had been undertaken on gray whales off Chukotka in the summer of 2006; it requests that a report on this latter work be made available to it as soon as possible. After considerable discussion, the Panel **agreed** that in principle, telemetry work on western gray whales should be carried out provided that:

- ( ) it be under the direction of Mate using his tags;
- ( ) it be restricted to ‘non-skinny’ males and take into account the occurrence of males with rare and common haplotypes when the final tagging protocol is adopted (A. Bradford of the Russia-USA programme is able to identify animals in real time in the field);
- ( ) Mate submits to the Panel, for review, a detailed experimental protocol including measures to be taken to minimise the possibility of accidental injury or stress to the animals, and a proposal on sample size in terms of attempts as well as successful attachments;
- ( ) a formal report is submitted to the Panel by the vet who determined the cause of death of the gray whale in Mate’s Mexican study (see WGWAP 1/INF.12);
- ( ) the Panel receives and considers the report of the Society for Marine Mammalogy’s workshop on whale tagging;
- ( ) experience from around the world on safeguards for the process (e.g. number of approaches allowed per day or other unit of time, total time spent with a particular animal) has been reviewed by the Panel – initial collation and drafts of associated recommendations to be carried out by Weller under contract to the Panel (IUCN);
- ( ) efforts have been made by the Panel to arrange contacts with appropriate range-state scientists for possible follow-up work;
- ( ) a final recommendation on protocols, time in the season to attempt tagging and sample size is not made until after consideration of the results of (c) – (g) and taking into account the view of the IWC Scientific Committee at its forthcoming meeting in Anchorage in May 2007; and
- ( ) weekly positional updates from transmitting tags are made available to the Panel (while maintaining the usual rights of data owners).

In view of these provisos, the Panel **recommends** that the tagging work not take place until the 2008 season, noting that this has the additional advantage of an anticipated lower level of industrial activity in the Sakhalin region (at least with respect to Sakhalin-II).

## 11 ENVIRONMENTAL MONITORING

The IISG report encouraged the development of Long Term Monitoring Plans (LTMPs) for benthic communities in the two known WGW feeding areas (‘Piltun’ and ‘Offshore’) and within Piltun Lagoon. It made a number of recommendations for the design of LTMPs in these areas. Lagoon monitoring was strongly recommended because of the persistent proximity of the primary whale feeding area to the Piltun Lagoon entrance channel, and the

suspected enhancement of benthic productivity in the Piltun feeding area as a result of detrital effluent from the lagoon.

Responses of Sakhalin Energy to the IISG recommendations for benthic monitoring were summarized in WGWAP 1/INF.13 and additional relevant material can be found in WGWAP 1/INF.29. Fadeev presented an overview of benthic studies supported by Sakhalin Energy on the NE Sakhalin Shelf, and during the meeting he provided comments to the Panel regarding the IISG recommendations. Except as noted below, there was general concurrence between the IISG recommendations and the company's LTMP plans. WGWAP 1/INF.13 identified documents from previous years describing benthic communities on the NE Sakhalin shelf and in Piltun Lagoon.

Sakhalin Energy's objections to development of an LTMP in Piltun Lagoon are based on the premise that Sakhalin II project activities are not likely to influence the lagoon ecosystem. The Panel recognizes the spatial separation of Piltun Lagoon from Sakhalin II activities, but nevertheless continues to **recommend** studies of the linkage of Lagoon biota and detrital output with WGW feeding areas. The Panel's view on this matter is driven by the potential linkage among areas by detrital transport and the potential for anthropogenic modifications of the lagoon ecosystem. The Panel recognizes the logistical challenges and potential costs of maintaining an effective LTMP in Piltun Lagoon, given its size and physical complexity and the spatial variation in within the lagoon ecosystem. It is **recommended** that Sakhalin Energy focus on measurements of quality and quantity of detrital transport from the Lagoon to whale feeding areas. Primary goals for study of detrital transport should be: identification of source species contributing to detrital mass, stable isotope signatures for detritus transported from the Lagoon to whale feeding areas, and interannual variation in quality and quantity of transported detritus.

Comments by Sakhalin Energy in WGWAP 1/INF.13 indicated concerns regarding IISG recommendations for improved sampling of mobile epibenthic species, and for use of sidescan sonar to improve large-scale measurements of the spatial distributions of benthic communities in the feeding areas. The Panel **suggests** that data on the abundances of mobile epifauna may be significant in understanding whale feeding behaviour, and **recommends** that Sakhalin Energy researchers work towards identification and application of an appropriate and efficient method for sampling mobile epifauna. The Panel **recommends** that Sakhalin Energy researchers continue to assess the potential value of sidescan methods in the context of benthic studies on the NE Sakhalin shelf.

The Panel was asked to consider a proposal from WWF-Russia for sampling benthos in Severnaya Bay on the NW Sakhalin shelf, given recent observations of foraging gray whales there. It notes that such studies could be valuable and concludes that this work should be pursued. The Panel emphasises that methods for assessing benthos should be the same as those employed in Sakhalin Energy studies of benthos in the two known whale feeding areas on the NE Sakhalin shelf.

The Panel **recommends** that Sakhalin Energy researchers take the following concepts into account as they proceed to develop LTMPs of benthic communities in the whale feeding areas:

- (a) LTMP design should reflect consideration of possible spatial and temporal separations in processes important to benthic community structure, dynamics and productivity. Detritus transport connections between Piltun Lagoon and the whale

feeding areas are an example of spatially distinct processes that could be important to whale food availability. Effects of winter and spring sea ice cover and movement on subsequent patterns and productivity of benthos provide examples of potentially important processes that are temporally disjunct.

- ( ) Continued monitoring of benthic communities in the whale feeding areas, using sampling approaches employed in previous years, is essential as a long-term commitment. Sampling effort should continue to focus on target variables identified in the IISG report. To maximise the potential both for large-scale inference and for discerning trends, sampling should continue in three categories: 1) a stratified random sample placement; 2) sampling of a grid of spatially fixed study sites; and 3) sampling in proximity to identified whale feeding locations.
- ( ) The development of effective methods for summarizing data on benthic communities and placing them in the contexts of spatially explicit time series is highly desirable. Such an approach is suggested because of the potential value in understanding connections between food availability and other time-varying patterns, such as annual calf production and the 'skinny whale' phenomenon (see item 4).
- ( ) Geographic information system (GIS) technology should be applied to the management and presentation of benthic community data. This approach facilitates the characterisation and communication of patterns in the data, and will contribute to understanding the linkages between community patterns and various physical, biological and anthropogenic processes on the NE Sakhalin shelf.

The Panel further **recommends** that it receive at its next meeting an integrated analysis and overview of results so far, with special attention to the observed annual difference in calf production (see Item 4.1, above).

## **12 TRAFFIC RULES AND MARINE MAMMAL OBSERVER PROGRAMME**

### **12.1 Traffic Rules**

Recommendations by the IISG concerning traffic rules focussed on the need for (a) slower speed limits in the navigation corridors as they approach the PA-A and PA-B platforms and (b) greater efforts to reduce collision risks from crew change vessels. Sakhalin Energy, in its detailed response of July 2006, responded positively to both recommendations although the matter of how to further reduce the number and frequency of trips by crew change vessels remained unresolved.

The Panel notes that the speed limit in the navigation corridors as they approach PA-A and PA-B was reduced from 17 to 10 knots, as recommended by the IISG. However, the IISG recommendation for a further reduction of the speed limit to 7 knots at night and/or in poor visibility conditions was not implemented by the company.

Concerning the issue of reducing collision risks associated with crew change vessels, the Panel welcomes some positive changes in the Sakhalin Energy approach. However, it believes that further work in this area is important and should be pursued. Therefore, it is **recommended** that:

- *both* crew change vessels have 2 MMOs onboard on a *permanent* basis, as recommended by the IISG, instead of ‘whenever possible’, as reported by Sakhalin Energy at this meeting;
- further measures be taken to avoid deviations of crew change vessels from the prescribed route;
- serious consideration continue to be given by Sakhalin Energy to the issue of ship-whale collision risks associated with the number and frequency of crew change vessel trips; a solution to this problem must be found.

## 12.2 Marine Mammal Observer (MMO) Programme

The IISG made a series of recommendations for improvement of the MMO programme and Sakhalin Energy confirmed in its detailed response of July 2006 that all of these recommendations had been appropriately addressed.

In its response to the concern raised by the IISG on effectiveness of the MMO training programme, Sakhalin Energy indicated that it considered the programme adequate and no improvement was needed. Taking into account previously raised concerns, the Panel **looks forward** to reviewing details of the MMO training protocol to examine its effectiveness prior to the 2007 construction season.

At this meeting, Sakhalin Energy reported preliminary results of the MMO effort in 2006. The company also informed the Panel of measures taken to improve quality control and management of data received from MMOs and entered into the WGW sightings database. The Panel welcomes creation of the database of MMO observations and encourages Sakhalin Energy to provide analyses of these data, particularly with respect to mitigation measures and intra- and inter-annual distribution. As a way of helping to assess the risk of ship-whale collisions during poor visibility conditions, it is **recommended** that, at a minimum, the following information be provided to the next meeting of the WGWAP:

- amount of MMO effort under conditions with visibility  $\leq 1$  km;
- number of crew change vessel trips conducted in conditions with visibility  $\leq 1$  km or at night;
- number of whales detected during poor weather conditions (e.g. visibility  $\leq 1$  km, Beaufort sea state  $\geq 3$ , or after sunset);
- number of whales detected during good weather and good visibility conditions.

The Panel **recognises** the effort invested by the company towards improving MMO effectiveness. Nevertheless, a meaningful evaluation of the MMO programme will be feasible only after a detailed report has been made available to the WGWAP on MMO observations and measures taken in response to them in the 2006 season. The Panel **recommends** that such a report be submitted for consideration at the next WGWAP meeting and emphasises that the report must be more than a collation of observer data and should include appropriate analyses.

Additionally, the Panel requests that Sakhalin Energy submit for review its protocol for allocating MMOs to the various vessels in the fleet.

Finally, the Panel **recommends** that Sakhalin Energy share its traffic rules, its scheme of vessel navigation corridors and its MMO programme plan with other oil and gas companies operating on the Sakhalin Shelf, regardless of whether those companies are obligated to implement such rules, protocols and programmes.

## **13 OIL SPILL ISSUES**

### **13.1 Last Winter's Oil Spill**

Some attention was given by the IISG to a large-scale seabird die-off on the northern coast of Hokkaido, Japan, from December 2005 through March 2006. It was confirmed that the oil recovered from sampled birds in this instance was not Sakhalin-II oil. The IISG nevertheless noted the potential value of sampling and analysis of these oiled birds for improved understanding of the behaviour of spilled oil in the region, which includes the WGW migration route. Specifically, the IISG recommended that Sakhalin Energy make an effort to determine the time, place and source of the spilled oil, with a view to integrating the data into models of oil spill trajectories in waters off northern Japan and southern Sakhalin. In its response to the IISG report, Sakhalin Energy indicated that it would not pursue the matter further, noting that 'because this spill was not connected with Sakhalin II project activities, and because it was concentrated in Japanese waters, the Company had no opportunity for involvement, nor was it called upon for assistance'.

No new information was presented at this meeting and therefore the origin of the spill remains unknown. The Panel **affirms** its continued interest in knowing more about this spill and requests that both Sakhalin Energy and IUCN make further inquiries and report on progress at the next WGWAP meeting.

### **13.2 Marine Oil Spill Prevention and Response - Development of a comprehensive overview framework for assessing the status of oil spill prevention and response activities**

As Sakhalin Energy prepares to initiate Sakhalin II, Phase 2 oil and gas production in 2008, the risks will shift from those associated with infrastructure construction to those associated with production and transport operations. The most obvious increase in risks will be due to environmental contamination from accidental release of oil, either as spills, leaks or accidental discharges. Over the past several years, Sakhalin Energy has been preparing to manage risk through a variety of processes including risk-averse planning, quantitative risk analysis, and development of prevention measures and spill response capabilities. From the initial IUCN independent review of Sakhalin II, Phase 2 to the present, WGW panels have been engaged in reviewing such preparations to evaluate the risks to the whale population and recommend measures to avoid or minimize them.

The drilling of first oil at the PA-B platform and the pipeline transport of oil from both PA-B and PA-A platforms constitute not only a milestone marking the end of the construction phase and the beginning of a new operational phase, but also a deadline for achieving, with confirmation by the Panel, an acceptable level of preparation for oil spill prevention and response. What actually constitutes an 'acceptable' level has been an issue at the heart of concerns related to the potential effects of oil and gas development in this region, which contains the primary feeding grounds of the western gray whale population. The long and complex task of preparing for environmentally safe oil and gas operations has been a challenge to evaluate because it is so complex and because Sakhalin Energy's plans and

procedures have, by necessity, been evolving over time. Some aspects of the evaluation are complete (e.g. the location of the PA-B platform and the pipeline route have been decided) and require no further attention by this Panel. Other aspects remain open for consideration. Some of these may be closed after further planning and review, and some will require ongoing attention for the lifetime of the project.

This Panel (and preceding panels, as can be seen in their reports) have attempted to address a wide range of issues surrounding oil spill prevention and response. Examples include adequacy of quantitative risk assessment; preventative measures and response plans; coordination of responders at local, regional, national and international levels; decision-making and command structures; adequacy of response equipment, supplies and logistics in what is a remote and often hostile environment; recovery of spilled oil under icy, winter conditions; protection of areas of special value with a focus on the Piltun feeding ground and Piltun Lagoon; collection of baseline information on gray whale habitat; potentially adverse effects of dispersants; the need to test and practice oil spill plans and responses before an actual event; and long-term monitoring to detect and evaluate low levels of accidentally released oil accumulating over time and space.

In view of the ongoing prevention/response planning and the impending initiation of oil production at the PA-B platform in 2008, the Panel must engage in a more comprehensive evaluation of the oil issue than has been possible to date. It needs to review the adequacy of previous recommendations by WGW panels, assess Sakhalin Energy's responses to those recommendations, and determine whether or what further action will be required to protect western gray whales and their habitat. This evaluation should clarify the company's progress to date, the current status of preparations and any remaining gaps in those preparations. It will require that Sakhalin Energy accounts fully and accurately for its preparations. Also, it will require interaction with other stakeholders to consider their remaining concerns and perspectives regarding oil spill risks. For this meeting, the Panel was informed by a useful review of oil spill response in ice, commissioned by WWF. In addition, a representative of potential lenders informed the Panel that an independent review of Sakhalin Energy's oil spill prevention and response measures and plans had been commissioned, and this will be provided to the Panel for its consideration. Thus, the Panel's review of progress to date will be informed and enhanced by a variety of perspectives.

The mechanism for undertaking this broad evaluation will be developed by a task force led by Van Blaricom and Ragen working with IUCN. The Panel agreed that the evaluation should take place immediately prior to and in conjunction with its spring 2007 meeting and that it should involve identified experts from Sakhalin Energy, potential lending institutions and other stakeholder groups. The evaluation will consider not only whether the oil spill prevention and response measures meet general international industry standards, but also whether they are sufficient to protect western gray whales and their habitat – with this higher standard being necessary because of the whale population's vulnerability and endangered status.

#### **14 MAPPING AND SPATIAL INFORMATION**

In discussing the availability of maps and other spatial information generally, the Panel noted that the recent experience of some members in trying to assess the implications of an exploratory well drilled for Sakhalin III (a Russia-China project) in August 2006, possibly near the southern boundary of the offshore feeding area, had demonstrated the inadequacy

of the map resources available. It was agreed that there was a need for access to an authoritative, up-to-date and more detailed map showing the spatial boundaries (including latitudes/longitudes) of the existing (and proposed) oil and gas lease areas on the Sakhalin Shelf. The Panel **recommends** that IUCN consult with industry (Sakhalin Energy as well as other companies), Russian governmental agencies, NGOs and other sources, as appropriate, to obtain better information on oil and gas activities in the Sakhalin region. Such information needs to be provided to the Panel on a routine basis.

The Panel also recalls the IISG's observation that significant value would be derived from digitising the extensive existing data on environmental variables and benthic communities of the north-eastern Sakhalin shelf so that a GIS database could be made available to the Panel as well as to other external experts. The Panel **welcomes** the news that Sakhalin Energy has commenced the development of a comprehensive GIS system through its Biodiversity Action Plan. That system is expected to provide a platform for data integration that will be made available to external experts.

The Panel further notes that it would be useful to obtain access to expertise in spatial data management and modelling (e.g. GIS, 3-dimensional modelling) for assistance in analysing existing and future data and for helping to ensure that such data are archived for future use. The creation and maintenance of a GIS or similar platform that can accommodate diverse types of data and that is scalable for future expansion of area covered and for adding data sources will require the involvement of an expert well-versed in developing this type of system. The Panel **recommends** that IUCN investigate and pursue this matter with Sakhalin Energy and relevant panel members on an ongoing basis and that a report on progress be provided at the next WGWAP meeting.

## **15 WORKING WITH OTHER GROUPS**

Section 4(f) of the WGWAP terms of reference encourages the Panel to 'seek information and input from scientists and researchers in related fields external to the WGWAP, and establish dialogues with scientific groups it deems relevant'. Four such groups were identified prior to this first meeting, including the International Whaling Commission (IWC), the Russian Group for Strategic Planning of Gray Whale Research (Russian Strategic Group), the North Slope Science Initiative (NSSI) and the North Pacific Marine Science Organisation (PICES).

### **15.1 International Whaling Commission (IWC)**

The IWC and its Scientific Committee have expressed interest in and concern for western gray whales for more than a decade. The conservation of this whale population falls within the IWC's mandate, and a lengthy record of relevant commentary and advice exists within the reports of Commission and Scientific Committee meetings. All but one of the WGW range states (Russia, Republic of Korea, Japan and China, but not Democratic People's Republic of Korea) are members of the IWC, and this means that IWC meetings provide opportunities for exchange of information and development of advice on research and management. Co-operation with the IWC Scientific Committee is ensured by the fact that several members of the Panel are also members of the IWC Scientific Committee.

### **15.2 Russian Group for Strategic Planning of Gray Whale Research**

This group was established in 2003 by the Scientific Advisory Committee on Marine Mammals, within the State Ichthyologic Commission, under the chairmanship of A.

Yablokov (WGWAP 1/INF.19), a member of this Panel. Its membership includes Russian scientists who have been involved in WGW research. Normally the group meets twice per year – once in early spring and once in late autumn or winter. The Strategic Group is recognised officially by Rosprirodnadzor, which is the Russian State Federal Agency responsible for management of living resources within the Ministry of Natural Resources. It reports directly to the Advisory Council on Marine Mammals of the State Ichthyologic Commission.

### **15.3 North Slope Science Initiative (NSSI)**

The NSSI was established in 2003 with a mandate to oversee and advise government, industry and the public on scientific aspects of resource development on the Alaskan North Slope (WGWAP 1/INF.20). The Initiative is managed by an Oversight Group that meets approximately every two months. A major focus of the Initiative has been impact assessment and mitigation in regard to marine offshore oil and gas development. The NSII is attempting to address many of the same key issues in relation to large whales as the IUCN panels have been addressing off Sakhalin – e.g. collision risk, potential disturbance from seismic and construction noise and contamination by oil spills.

### **15.4 PICES**

PICES, the North Pacific Marine Science Organization, is an intergovernmental scientific organization that was established in 1992, whose primary objectives are promoting and coordinating marine research in the northern North Pacific and adjacent seas, and advancing scientific knowledge about the ocean environment, global weather and climate change, living resources and their ecosystems, and the impacts of human activities (WGWAP 1/INF.21). The organisation has established numerous subsidiary bodies focused on specific issues, including an advisory panel on marine birds and mammals.

## **16 WORK PROGRAMME**

During discussions, a number of general issues arose that the Panel wishes to comment on with respect to its future role and work. These are summarised below.

- (1) The final responsibility for Panel reports lies with the Panel. It is thus essential that during each meeting, sufficient time is left at the end of each afternoon, as well as at the end of the meeting, for Panelists to discuss and draft the report. Consequently, it is suggested that the ‘plenary’ sessions should finish by 15.30.
- (2) One of the primary advantages seen in the establishment of a long-term panel was the ability for it to become proactive rather than simply reactive. For this to become reality, a process of consultation with the Panel before research programs are undertaken is required, to enable a review of proposed data collection and analytical methods, rather than simply a review of the results (this is also relevant to item (5) below).
- (3) It is important that Sakhalin Energy, voluntarily and in a timely fashion, provides the Panel with information about planned and potential activities (both Sakhalin Energy ‘solo’ operations and those undertaken in conjunction with others such as Exxon Mobil) so that we can be prepared to comment and make recommendations on monitoring and mitigation well ahead of time. For example, it seems certain that there will be more seismic work and even if the timing is unsure, there must be a



preliminary idea of what this might involve (e.g. several companies are now using 4-D seismic surveys to determine how fields are changing in response to production and there is a need for seismic surveys related to gas).

- (4) The Panel considers it extremely important that the issues of oil spill prevention and response are addressed rigorously. In order to enable the Panel to consider these issues in a comprehensive fashion, it is important that third parties provide technical input (via IUCN) that may be relevant to the protection of gray whales and related biodiversity from oil exposure.
- (5) The Panel believes that it is essential to try to arrive at agreed protocols for certain key data needs, especially in those instances where more than one group of researchers are working. Without this it is difficult or impossible to combine datasets to obtain the maximum value from the research or to allow sensible comparison of conflicting results (one example that became apparent at the present meeting was that of behavioural data).
- (6) In this regard, and notwithstanding issues of protection for data owners, the Panel believes there is great value in developing a comprehensive meta-database (ideally with the potential to link in with GIS for spatial data) of available data sources, in addition to the photo-identification data issue being addressed by the task force. The Panel recognises that a great quantity of data (sightings, behaviour, benthos etc) have been collected by a variety of groups and documenting this will allow the Panel to suggest analyses to answer particular questions as well as to determine data gaps where they exist.
- (7) The Panel received a document at this meeting asking for an endorsement of a particular programme and it has also received the results of work undertaken in the region by groups other than those associated with Sakhalin Energy and the Russia-USA programme – the Panel notes that all documents will appear on the IUCN website and it believes that it is important to make clear on the website that appearance on there does not imply that any document, whatever the authorship, has been endorsed (or even necessarily considered) by the Panel.
- (8) It should be made clear to all that the level of review assigned to any study presented to the Panel will be of equal rigour, whatever its origin.
- (9) Compliance monitoring may not seem to be an issue for a scientific panel but it is essential that for any recommended and agreed mitigation measure, the Panel can be assured that it (and any associated scientific monitoring) is implemented. Therefore, it is likely that the value of and need for independent compliance monitoring will form part of the Panel's recommendations in the future.
- (10) Given the Panel's mandate and the need to examine cumulative effects on whales, it is essential that IUCN begin efforts as soon as possible to engage other companies, notably Exxon Mobil and BP, in the WGWAP process, even if initially this does not mean as full partners.

## References

Kastak, D. *et al.* 2005. Underwater temporary threshold shift in pinnipeds: effects of noise level and duration. *Journal of the Acoustical Society of America* 118(5):

Malme, C.I., Würsig, B., Bird, J.E. and Tyack, P. 1986. Behavioural responses of gray whales to industrial noise: feeding observations and predictive modeling. Outer Continental Shelf Environmental Assessment Program, Final Reports of Principal Investigators, NOAA, Anchorage, AK 56(1988):393-600. BBN Rep. 6265. 600 pp. OCS Study MMS 88-0048; NTIS PB88-249008.

Malme, C.I., Würsig, B., Bird, J.E. and Tyack, P. 1988. Observations of feeding gray whale responses to controlled industrial noise exposure. Pp. 55-73 in W.M. Sackinger, M.O. Jeffries, J.L. Imm and S.D. Treacy, eds., *Port and ocean engineering under Arctic conditions*, vol. II. Geophysical Institute, University of Alaska, Fairbanks, AK. 111 pp.

Weller, D.W., Burdin, A.M., Bradford, A.L., Lang, A.R., Tsidulko, G.A., Kim, H.W. and Brownell, R.L. Jr. 2006. Status of western gray whales off northeastern Sakhalin Island, Russia, in 2005. Document SC/58/BRG3, Scientific Committee, International Whaling Commission, Cambridge, UK.

## TABLE OF RECOMMENDATIONS

Reference	Cross-Reference	WGWAP Recommendation & Requests	Responsible Party	Target Completion Date
<b><u>MID- TO LONG-TERM WORK PLAN</u></b>				
WGWAP 1/001	WGWAP 1/3 - Section 3.0	<p>The Panel <b>requests</b> that Sakhalin Energy prepare a schedule of its work for at least the next five years – this should include the construction and operations schedule, the research and monitoring plans and the times when decisions will be taken. As well as confirmed activities, it should indicate all anticipated or likely events, such as seismic testing.</p> <p>In addition, the Panel <b>requests</b> that Sakhalin Energy establish a standard practice of keeping it informed of its plans, through IUCN, without the Panel having to request such information repeatedly.</p>	SEIC	
<b><u>ANNUAL POPULATION ASSESSMENT</u></b>				
WGWAP 1/002	WGWAP 1/3 - Section 4.2	<p>The Panel <b>recommends</b> that from this year onwards, certain simple statistics from photo-identification studies be reported by Sakhalin Energy as routine information after each field season, including: field effort, number of different whales sighted and identified, number of identified females and males sighted, number of calves, number of 'new' whales, number of mother-calf pairs, number of skinny whales, and any known deaths.</p> <p>The Panel also looks forward to receiving the detailed analysis of the 'skinny' whale issue being undertaken by the Russia-USA team.</p>	SEIC	
<b><u>MULTIVARIATE ANALYSIS</u></b>				
WGWAP 1/003	WGWAP 1/3 - Section 6.0	Time spent WGWs diving may be an indicator of foraging effort or success and should be explored more carefully. Accordingly, the Panel <b>suggests</b> that reanalysis of behavioural data based on percent of total time spent below the surface would be a useful follow-up to assess possible changes in foraging effort.	SEIC	
WGWAP 1/004	WGWAP 1/3 - Section 6.0	<p>In view of the endangered status of this population, the observed offshore displacement, change in diving pattern, and other potential effects warrant additional scrutiny and follow-up. Points to consider include the following:</p> <p>(1) From a conservation perspective, the objective of the study was to test the null hypothesis that construction noise and associated activities have no impact on the population. The observation of apparent effects on individuals (e.g. offshore displacement) suggests that a population impact may occur and this possibility should be investigated further rather than being dismissed as insignificant</p>	SEIC	

Reference	Cross-Reference	WGWAP Recommendation & Requests	Responsible Party	Target Completion Date
		<p>(2) The study would benefit from an exploration of the relationships among the predictor variables and among the response variables. For example, response variables may be related, given that they depend on the behaviour of an animal (e.g. an animal that is travelling at greater speed spends more time at the surface and moves in a more nearly constant direction). Such possibilities should be explored to provide the best possible understanding of the relationships among the different variables and the most appropriate form of the predictor and response variables. Principal components analysis is one way to examine these relationships and is often used as a preliminary step to explore the data before hypothesis testing is initiated.</p>		
		<p>(3) The 'subjects' of the research also warrant reconsideration. In the analysis considered at the meeting, the authors had chosen to pool data for mother-calf pairs and single-whale groups. Unfortunately, this adds a confounding discontinuity in the subject pool because mother-calf pairs behave differently from single whales. Such pooling should always be preceded by comparison of the behaviour of the groups under consideration to confirm their homogeneity before pooling. Homogeneity is highly unlikely given the different distributions and behaviours of the two types of group.</p>		
		<p>(4) The results were confounded by extraneous variables, most notably vessel noise from watercraft used for research purposes (photo-id). In future studies, greater effort should be made to avoid the confounding effects of such variables either by eliminating them as part of the research design or developing analytical methods to remove their influence on the analysis. It is also worth noting that this finding provides a clear basis to recommend that duplication of photo-identification research effort be avoided in the future.</p>		
		<p>(5) The use of variables that are more-or-less arbitrarily determined (e.g. noise exposure over a 10-minute period) also should be examined to determine the potential effect of the chosen time period on the results. For example, in the case where distance offshore is the response variable, an implicit assumption of using 10-minute noise exposure as an explanatory variable is that whales would move back towards shore during a 10-minute lull in the noise. This assumption is not realistic; it may take much longer for the distribution of whales to return to normal. Use of the 10-minute interval as the explanatory variable could, therefore, seriously underestimate the true effect of noise.</p>		
		<p>(6) Finally, during previous reviews of Sakhalin Energy's activities and evaluations of the potential effects of construction noise, the panels have repeatedly indicated that noise level alone may not be the most relevant or the only indicator of the influence of noise on the whales. The analysis apparently did not take into account the total noise energy exposure, duration of exposure, frequency and bandwidth of the noise, amount of variation in noise levels over time, occurrence of noise spikes, etc. In particular, the timescale involved in the whales' response to a stimulus (e.g. movement offshore) and in the subsequent decay of the response (e.g. movement back towards shore) needs to be considered explicitly in an analysis. This and other aspects of the noise exposure ought to be considered and explored before reaching firm conclusions about potential effects.</p>		

Reference	Cross-Reference	WGAP Recommendation & Requests	Responsible Party	Target Completion Date
WGAP 1/005	WGAP 1/3 - Section 6.0	<p>The Panel <b>recommends</b> that:</p> <ol style="list-style-type: none"> <li>(1) The above 'points to consider' be taken into account in the final report on the multivariate analysis of 2005 data.</li> <li>(2) In the final report, and in any other outlet citing its findings (e.g. on Sakhalin Energy's website), the study's limits, as outlined above e.g. in relation to the lack of baseline (pre-disturbance) behavioural data and the failure to collect behavioural data during the two loudest phases of the construction activity, be clearly acknowledged. It should not be claimed that the extent of the whales' response to noise, such as movement offshore, has been quantified.</li> <li>(3) The foregoing concerns and suggestions be considered in analyses of effects using 2006 data and also in the planning and decision-making process for data collection and analysis in 2007.</li> </ol>	SEIC	

**MONITORING WHALE BEHAVIOUR & INDUSTRIAL NOISE**

WGAP 1/006	WGAP 1/3 - Section 7.1	The Panel <b>recommends</b> that it be provided with a full analysis using effort-corrected data on distribution, for each year that such data are available, overlaid onto the appropriate acoustic 'footprint' information. The results should be integrated to produce an appropriate multi-year comparison of distribution, particularly for years with and without significant anthropogenic noise	SEIC	
WGAP 1/007	WGAP 1/3 - Section 7.2	The Panel <b>recommends</b> that noise exposure criteria developed in the IISG report and intended for application in the 2006 construction season be followed during the 2007 season and thereafter unless, during the interim, sound exposures below the recommended thresholds are found to result in unexpected adverse effects.. In addition, the panel <b>requests</b> the following information for its next meeting (spring 2007):	SEIC	
		(1) All acoustic data from buoys at the edge and inside the feeding area, reported in standard formats, e.g., dB re 1 µPa RMS levels for 1 minute intervals.		
		(2) Actual day-by-day construction activities for each vessel involved in June-August 2006 construction.		
		(3) Whale distribution data for 2006, corrected for effort, analyzed with respect to noise levels, and compared to appropriate historical data.		
		(4) An analysis of the relationship between the 2006 acoustic data and concurrent behavioural observations.		

Reference	Cross-Reference	WGWAP Recommendation & Requests	Responsible Party	Target Completion Date
WGWAP 1/008	WGWAP 1/3 - Section 7.3	The Panel emphasises its concern about one major drawback of having multiple research and monitoring teams in the field, which is that it can add to the disturbance from vessel noise or vessel presence on and near the feeding grounds. Therefore, any encouragement of independent initiatives must carry a caveat – that due consideration be given to this concern and that every effort is made to avoid or minimise additional disturbance to the whales.	ALL RESEARCH GROUPS	
<b><u>IMPLEMENTATION OF CARCASS DETECTION/SALVAGE PROGRAMME</u></b>				
WGWAP 1/009	WGWAP 1/3 - Section 8.0	The Panel <b>agreed</b> that it would provide Sakhalin Energy with a recommended minimum altitude and distance from the shore, for these types of surveys prior to the 2007 construction season.	WGWAP	
WGWAP 1/010	WGWAP 1/3 - Section 8.0	The Panel <b>recommends</b> that the northern areas should be surveyed by helicopter monthly during the open-water season. Although these areas may be observed by research groups as they move into and out of the region, ground vehicles are not sufficient for complete coverage because the beach zone is not always visible from the road.	SEIC	
WGWAP 1/011	WGWAP 1/3 - Section 8.0	The Panel endorses the relatively detailed protocols and advice given in the IISG report under the heading 'Carcass Detection, Salvage and Necropsy'. It also <b>recommends</b> that as a minimal response to the finding of a gray whale carcass, Sakhalin Energy make sure that it is photographed promptly and that IUCN is notified by phone or e-mail as soon as possible. Then, based on the condition of the carcass (as inferred from the photographs), the Panel will make recommendation concerning what materials should be collected etc.	SEIC	
<b><u>DNA AND OTHER BIOLOGICAL SAMPLING</u></b>				
WGWAP 1/012	WGWAP 1/3 - Section 9.0	In terms of DNA and other biological sampling, the Panel refers Sakhalin Energy to the IISG report where detailed advice was provided. Here, it <b>recommends</b> that a tissue sample (preferably skin or bone) be collected as soon as possible if any carcass of a baleen whale is found and there is any possibility that it could be a gray whale.	SEIC	
<b><u>SATELLITE TAGGING</u></b>				
WGWAP 1/013	WGWAP 1/3 - Section 10.0	The Panel <b>requests</b> that a report on tagging work undertaken on gray whales off Chukotka in the summer of 2006 be made available to it as soon as possible.	SEIC	
WGWAP 1/014	WGWAP 1/3 - Section 10.0	The Panel agreed that in principle, telemetry work on western gray whales should be carried out provided that:	Joint responsibility	
		(a) It be under the direction of Bruce Mate using his tags;		

Reference	Cross-Reference	WGWAP Recommendation & Requests	Responsible Party	Target Completion Date
		(b) It be restricted to 'non-skinny' males and take into account the occurrence of males with rare and common haplotypes when the final tagging protocol is adopted;		
		(c) Bruce Mate submits to the Panel, for review, a detailed experimental protocol including measures to be taken to minimise the possibility of accidental injury or stress to the animals, and a proposal on sample size in terms of attempts as well as successful attachments;		
		(d) A formal report is submitted to the Panel by the vet who determined the cause of death of the gray whale in Bruce Mate's Mexican study (see WGWAP 1/INF.12);		
		(e) The Panel receives and considers the report of the Society for Marine Mammalogy's workshop on whale tagging;		
		(f) Experience from around the world on safeguards for the process (e.g. number of approaches allowed per day or other unit of time, total time spent with a particular animal) has been reviewed by the Panel;		
		(g) Efforts have been made by the Panel to arrange contacts with appropriate range-state scientists for possible follow-up work;		
		(h) A final recommendation on protocols, time in the season to attempt tagging and sample size is not made until after consideration of the results of (c) – (g) and taking into account the view of the IWC Scientific Committee at its forthcoming meeting in Anchorage in May 2007; and		
		(i) Weekly positional updates from transmitting tags are made available to the Panel (while maintaining the usual rights of data owners).		
WGWAP 1/015	WGWAP 1/3 - Section 10.0	In view of the provisos listed in Recommendation WGWAP 1/014, the Panel <b>recommends</b> that the tagging work does not take place until the 2008 season, noting that this has the additional advantage of an anticipated lower level of industrial activity in the Sakhalin region (at least with respect to Sakhalin-II).		

**ENVIRONMENTAL MONITORING**

WGWAP 1/016	WGWAP 1/3 - Section 11.0	The Panel recognizes the spatial separation of Piltun Lagoon from Sakhalin II activities, but nevertheless continues to <b>recommend</b> studies of the linkage of Lagoon biota and detrital output with GWW feeding areas.	SEIC	
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Reference	Cross-Reference	WGWAP Recommendation & Requests	Responsible Party	Target Completion Date
WGWAP 1/017	WGWAP 1/3 - Section 11.0	The Panel recognizes the logistical challenges and potential costs of maintaining an effective LTMP in Piltun Lagoon, given its size and physical complexity and the spatial variation in within the lagoon ecosystem. It is <b>recommended</b> that Sakhalin Energy focus on measurements of quality and quantity of detrital transport from the Lagoon to whale feeding areas. Primary goals for study of detrital transport should be: identification of source species contributing to detrital mass, stable isotope signatures for detritus transported from the Lagoon to whale feeding areas, and interannual variation in quality and quantity of transported detritus.	SEIC	
WGWAP 1/018	WGWAP 1/3 - Section 11.0	The Panel <b>suggests</b> that data on the abundances of mobile epifauna may be significant in understanding whale feeding behaviour, and <b>recommends</b> that Sakhalin Energy researchers work towards identification and application of an appropriate and efficient method for sampling mobile epifauna.	SEIC	
WGWAP 1/019	WGWAP 1/3 - Section 11.0	The Panel <b>recommends</b> that Sakhalin Energy researchers continue to assess the potential value of sidescan methods in the context of benthic studies on the NE Sakhalin shelf.	SEIC	
WGWAP 1/020	WGWAP 1/3 - Section 11.0	The Panel was asked to consider a proposal from WWF-Russia for sampling benthos in Severnya Bay on the NW Sakhalin shelf, given recent observations of foraging gray whales there. It <b>notes</b> that such studies could be valuable and concludes that this work should be pursued. The Panel emphasises that methods for assessing benthos should be the same as those employed in Sakhalin Energy studies of benthos in the two known whale feeding areas on the NE Sakhalin shelf.	ALL RESEARCH GROUPS	
WGWAP 1/021	WGWAP 1/3 - Section 11.0	The Panel <b>recommends</b> that Sakhalin Energy researchers take the following concepts into account as they proceed to develop LTMPs of benthic communities in the whale feeding areas:	SEIC	
		(1) LTMP design should reflect consideration of possible spatial and temporal separations in processes important to benthic community structure, dynamics and productivity. Detrital transport connections between Piltun Lagoon and the whale feeding areas are an example of spatially distinct processes that could be important to whale food availability. Effects of winter and spring sea ice cover and movement on subsequent patterns and productivity of benthos provide examples of potentially important processes that are temporally disjunct.		
		(2) Continued monitoring of benthic communities in the whale feeding areas, using sampling approaches employed in previous years, is essential as a long-term commitment. Sampling effort should continue to focus on target variables identified in the IISG report. To maximise the potential both for large-scale inference and for discerning trends, sampling should continue in three categories: 1) a stratified random sample placement; 2) sampling of a grid of spatially fixed study sites; and 3) sampling in proximity to identified whale feeding locations.		
		(3) The development of effective methods for summarizing data on benthic communities and placing them in the contexts of spatially explicit time series is highly desirable. Such an approach is suggested because of the potential value in understanding connections between food availability and other time-varying patterns, such as annual calf production		



Reference	Cross-Reference	WGWAP Recommendation & Requests	Responsible Party	Target Completion Date
		and the 'skinny whale' phenomenon (see item 4).  (4) Geographic information system (GIS) technology should be applied to the management and presentation of benthic community data. This approach facilitates the characterisation and communication of patterns in the data, and will contribute to understanding the linkages between community patterns and various physical, biological and anthropogenic processes on the NE Sakhalin shelf.		
WGWAP 1/022	WGWAP 1/3 - Section 11.0	The Panel further <b>recommends</b> that it receive at its next meeting an integrated analysis and overview of results so far, with special attention to the observed annual difference in calf production.	SEIC	

**TRAFFIC RULES AND MARINE MAMMAL OBSERVATION PROGRAMME**

WGWAP 1/023	WGWAP 1/3 - Section 12.1	Concerning the issue of reducing collision risks associated with crew change vessels, the Panel notes some positive changes in the Sakhalin Energy approach. However, it believes that further work in this area is important and should be pursued. Therefore, it is <b>recommend</b> that:	SEIC	
		(a) Both crew change vessels have 2 MMOs onboard on a <i>permanent</i> basis, as recommended by the IISG, instead of 'whenever possible', as reported by Sakhalin Energy at this meeting;		
		(b) Further measures be taken to avoid deviations of crew change vessels from the prescribed route;		
		(c) Serious consideration continue to be given by Sakhalin Energy to the issue of collision risk associated with number and frequency of crew change vessel trips; a solution to this problem must be found.		
WGWAP 1/024	WGWAP 1/3 - Section 12.2	Taking into account previously raised concerns with regard to the effectiveness of the MMO programme, the Panel <b>looks forward</b> to reviewing details of the MMO training protocol to examine its effectiveness prior to the 2007 construction season.	SEIC	
WGWAP 1/025	WGWAP 1/3 - Section 12.2	As a way of helping to assess the risk of ship-whale collisions during poor visibility conditions, it is <b>recommended</b> that, at a minimum, the following information be provided to the next meeting of the WGWAP:	SEIC	
		(a) Amount of MMO effort under conditions with visibility $\leq 1$ km;		
		(b) Number of crew change vessel trips conducted in conditions with visibility $\leq 1$ km or at night;		
		(c) Number of whales detected during poor weather conditions (e.g. visibility $\leq 1$ km, Beaufort sea state $\geq 3$ , or after sunset);		
		(d) Number of whales detected during good weather and good visibility conditions.		

Reference	Cross-Reference	WGWAP Recommendation & Requests	Responsible Party	Target Completion Date
WGWAP 1/026	WGWAP 1/3 - Section 12.2	The Panel <b>recognises</b> the effort invested by the company towards improving MMO effectiveness. Nevertheless, a meaningful evaluation of the MMO programme will be feasible only after a detailed report has been made available to the Panel on MMO observations and measures taken in response to them in the 2006 season. The Panel <b>recommends</b> that such a report be submitted for consideration at the next WGWAP meeting and emphasises that the report must be more than a collation of observer data and should include appropriate analyses.	SEIC	
WGWAP 1/027	WGWAP 1/3 - Section 12.2	Additionally, the Panel <b>requests</b> that Sakhalin Energy submit for review its protocol for allocating MMOs to the various vessels in the fleet.	SEIC	
WGWAP 1/028	WGWAP 1/3 - Section 12.2	Finally, the Panel <b>recommends</b> that Sakhalin Energy share its traffic rules, its scheme of vessel navigation corridors and its MMO programme plan with other oil and gas companies operating on the Sakhalin Shelf, regardless of whether those companies are obligated to implement such rules, protocols and programmes.	SEIC	

**OIL SPILL ISSUES**

WGWAP 1/029	WGWAP 1/3 - Section 13.0	The Panel <b>affirms</b> its continued interest in knowing more about the oil spill that occurred in the vicinity of Hokkaido in January 2006 (and considered by the IISG) and <b>requests</b> that both Sakhalin Energy and IUCN make further inquiries and report on progress at the next WGWAP meeting.	IUCN / SEIC	
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**MAPPING & SPATIAL DATA**

WGWAP 1/030	WGWAP 1/3 - Section 14.0	It was agreed that there was a need for access to an authoritative, up-to-date and more detailed map showing the spatial boundaries (including latitudes/longitudes) of the existing (and proposed) oil and gas lease areas on the Sakhalin Shelf. The Panel <b>recommends</b> that IUCN consult with industry (Sakhalin Energy as well as other companies), Russian governmental agencies, NGOs and other sources, as appropriate, to obtain better information on oil and gas activities in the Sakhalin region. Such information needs to be provided to the Panel on a routine basis.	IUCN	
		The Panel <b>welcomes</b> the news that Sakhalin Energy has commenced the development of a comprehensive GIS system through its Biodiversity Action Plan.		
WGWAP 1/031	WGWAP 1/3 - Section 14.0	The Panel further noted that it would be useful to obtain access to expertise in spatial data management and modelling (e.g. GIS, 3-dimensional modelling) for assistance in analysing existing and future data and for helping to ensure that such data are archived for future use. The Panel <b>recommends</b> that IUCN investigate and pursue this matter with Sakhalin Energy and relevant panel members on an ongoing basis and that a report on progress be provided at the next WGWAP meeting.	IUCN	

## ANNEX 1

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## ANNEX 2

### Provisional Agenda for GWAP Meeting

Chair – Randall Reeves (GWAP)

**9 November**

<b>13:00-13:15</b>	<b>Opening of panel session</b> <ul style="list-style-type: none"><li>– Adoption of agenda</li><li>– Discussion of report drafting procedures</li></ul>	
<b>13:15-13:45</b>	<b>SEIC presentation on mid- to long- term work plan</b>	Presentation
<b>13:45-15:00</b>	<b>Annual population assessment</b> <ul style="list-style-type: none"><li>– Annual assessment of WGW “biological and demographic state”</li><li>– Discussion and agreement on what such an assessment entails and how the work will be carried out</li></ul>	GWAP 1/INF.7 GWAP 1/INF.22 GWAP 1/INF.23 GWAP 1/INF.24 GWAP 1/INF.25
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<b>15:00-15:15</b>	<b>Break</b>	
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<b>15:15-17:30</b>	<b>Photographic identification of GWs</b> <ul style="list-style-type: none"><li>– Integration of photo-identification catalogues</li></ul>	GWAP 1/INF.3 GWAP 1/INF.8 GWAP 1/INF.9 GWAP 1/INF.22 GWAP 1/INF.23 GWAP 1/INF.24 GWAP 1/INF.25
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<b>17:30</b>	<b>Adjourn for the Day</b>	
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<b>19:30</b>	<b>IUCN hosted dinner</b>	

## 10 November

<b>08:30-09:45</b>	<b>Multivariate analysis</b> <ul style="list-style-type: none"><li>– Briefing from SEIC and discussion of multivariate analysis of 2005 field work</li></ul>	WGWAP 1/INF.1 WGWAP 1/INF.2  WGWAP 1/INF.4
<b>09:45-10:15</b>	<b>Monitoring whale behaviour and industrial noise</b>	WGWAP 1/INF. 26 WGWAP 1/INF. 28
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<b>10:15 -10:30</b>	<b>Break</b>	
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<b>10:30-11:45</b>	<b>Monitoring whale behaviour and industrial noise contd.</b>	
<b>11:45:12:15</b>	<b>Monitoring activities by independent groups</b>	WGWAP 1/INF.5 WGWAP 1/INF.6 WGWAP 1/INF. 27
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<b>12:15-13:15</b>	<b>Lunch</b>	
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<b>13:15-14:00</b>	<b>Carcass detection &amp; salvage</b> <ul style="list-style-type: none"><li>– Implementation of carcass detection/salvage program</li></ul>	WGWAP 1/INF.10
<b>14:00-14:15</b>	<b>DNA and other biological sampling</b> <ul style="list-style-type: none"><li>– How to organize sampling and analyses</li><li>– Obtaining and analyzing tissues from dead WGWs, wherever they are found</li></ul>	Panel discussion
<b>14:15-15:00</b>	<b>Satellite tagging</b> <ul style="list-style-type: none"><li>– Overview of Bruce Mate's plans, post-tag monitoring, reporting arrangements, etc</li></ul>	WGWAP 1/INF.11 WGWAP 1/INF.12 WGWAP 1/INF.23 WGWAP 1/INF.25
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<b>15:00-15:15</b>	<b>Break</b>	
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<b>15:15-15:45</b>	<b>Satellite tagging contd.</b>	
<b>15:45-16:45</b>	<b>Environmental monitoring</b> <ul style="list-style-type: none"><li>– Point-by-point discussion of SEIC responses to detailed proposal (in IISG report) for long-term benthic and epibenthic monitoring</li></ul>	WGWAP 1/INF.13 WGWAP 1/INF. 29
<b>16:45-17:30</b>	<b>Collisions &amp; traffic rules</b> <ul style="list-style-type: none"><li>– Review of progress since April 2006</li><li>– Reduced speed limits in E-W portions of navigation corridors</li><li>– Changes in schedules, manning and other protocols for crew change vessel(s)</li></ul>	SEIC presentation
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<b>17:30</b>	<b>Adjourn for the Day</b>	
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**11 November**

**08:30-09:00 Day 2 – Unfinished business**

**09:00-09:15 Last winter's oil spill**

- Update on bird die-off in Hokkaido in early 2006

**09:15-09:45 Marine oil spill prevention and response**

- Offshore oil spill response in dynamic ice conditions

WGWAP 1/INF.15

WGWAP 1/INF.16

WGWAP 1/INF.17

WGWAP 1/INF.18

**09:45-10:15**

- Status of oil spill prevention and response issues from previous meetings

WGWAP 1/INF.14

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**10:15-10:30 Break**

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**10:30-11:30 Marine oil spill prevention and response contd.**

- Development of a comprehensive overview framework for assessing the status of oil spill prevention and response activities

Panel discussion

**11:30-12:00 Mapping and spatial information**

- Application and benefits of spatial data
- Accessing authoritative, reasonably detailed map(s) of locations (actual boundaries) of oil and gas lease areas on Sakhalin Shelf

Panel discussion

**12:00-12:30 Working with other groups**

- Russian National Group on Strategic Planning of WGW Research
- Alaska North Slope
- PICES

WGWAP 1/INF.19

WGWAP 1/INF.20

WGWAP 1/INF.21

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**12:30-13:30 Lunch**

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**13:30-15:00 Work programme**

- Access to advance information on construction and operation schedules for Sakhalin II and other projects.
- Co-option of additional participants with particular expertise
- Task forces
- Research priorities

**15:00-17:30 Report Writing**

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**17:30 ENDS**

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### ANNEX 3

#### List of documents distributed in connection with the first meeting of the GWAP

Document Ref.	Document Title	Status
GWAP 1/1	Provisional agenda	Public
GWAP 1/2	List of documents distributed in connection with the first meeting of the GWAP	Public
GWAP 1/INF.1	Western gray whale movement, behaviour, and relative abundance in relation to sounds generated by the installation of a concrete gravity base structure and vessel activities	Confidential
GWAP 1/INF.2	Review and MOM for western gray whale movement, behaviour and relative abundance in relation to sounds generated by the installation of CGBS and vessel activities	Confidential
GWAP 1/INF.3	Summary information for a catalogue of photo-identified western gray whales	Public
GWAP 1/INF.4	Report of monitoring results – whale behaviour and industrial noise - from 2006 construction season	Confidential
GWAP 1/INF.5	Preliminary results of observations on Western Pacific gray whale distribution and behaviour in the summer 2006 during the construction of the offshore pipeline of the “Sakhalin-2”	Public
GWAP 1/INF.6	Report of monitoring results from 2006 construction seasons	Pending
GWAP 1/INF.7	Population assessment of Western Gray Whales in 2006 - IWC SC BRG30	Public
GWAP 1/INF.8	Western gray whales off Sakhalin Island, Russia: A catalogue of photo-identified individuals - IWC SC BRG2	Public
GWAP 1/INF.9	Updated report on SEIC Photo-ID	Confidential
GWAP 1/INF.10	Western Gray Whale stranded carcass surveys	Public
GWAP 1/INF.11	IWC/Bruce Mate – satellite tagging and tracking documents	Pending
GWAP 1/INF.12	Report tagging efforts on gray whales in the Bering and/or Chukchi Sea	Confidential
GWAP 1/INF.13	SEIC document(s) on long term benthic monitoring	Public
GWAP 1/INF.14	Status of oil spill prevention and response issues from previous meetings	Public
GWAP 1/INF.15	Sakhalin II: Summary of Oil Spill Response in Ice Conditions	Public
GWAP 1/INF.16	Offshore oil spill response in dynamic ice conditions: A report to WWF on considerations for the Sakhalin II project.	Public
GWAP 1/INF.17	Peer review report of the WWF oil spills in dynamic ice conditions report – Dickens Associates	Public
GWAP 1/INF.18	Response form Nuka Research to the Dickens Associates report	Public
GWAP 1/INF.19	Russian National group on strategic planning of GW research – Summary Information	Public
GWAP 1/INF.20	North Slope Oil & Gas development oversight group – Summary information	Public
GWAP 1/INF.21	The North Pacific Marine Science Organization ( <u>PICES</u> ) –Summary information	Public
GWAP 1/INF.22	Extract from the 2005 IWC Scientific Committee Report, Annex F: Report of the Sub-Committee on Bowhead, Right and Gray Whales	Public

WGWAP 1/INF.23	Extract from the 2006 IWC Scientific Committee Report, Annex F: Report of the Sub-Committee on Bowhead, Right and Gray Whales	Public
WGWAP 1/INF.24	Extract from the 2005 IWC Scientific Committee Report: Western north Pacific stock of gray whales	Public
WGWAP 1/INF.25	Extract from the 2006 IWC Scientific Committee Report: Western north Pacific stock of gray whales	Public
WGWAP 1/INF.26	Notes of the observers on the performance of Sakhalin Energy Investment Company (SEIC) offshore construction work and SEIC gray whale monitoring programme in 2006	Public
WGWAP 1/INF.27	WWF proposal for 2007 field research	Public
WGWAP 1/INF.28	Briefing document on real-time acoustic monitoring in Piltun during 2006 season	Confidential
WGWAP 1/INF.29	Long term research and monitoring plan	Confidential
WGWAP 1/INF.30	Summary of 2007 and 2008 construction activity	Pending



## ANNEX 4

### Terms of Reference and work plan for Photo-id Task Force

#### Objectives

(a) to compare the catalogues<sup>3</sup> of the Russia-USA programme and the Institute of Marine Biology (Vladivostok) programme to arrive at an agreed list of known individuals;

(b) to suggest appropriate further collaboration, taking into account the need for annual updating of the comparison, and for consistency in: (i) identification of new individuals; (ii) identification of re-sightings; and (iii) classification of photographic quality.

#### Methods

1. Conduct a cross-matching of the two existing catalogues, involving: (a) the people involved in the development and matching of the individual catalogues; and (b) additional experienced matchers:
  - determine, for each whale in each catalogue, which whale, if any, it matches in the other catalogue;
  - resolve doubtful cases, if necessary by examining all available photographs of the whales involved.
2. Discuss, and if possible make recommendations for, further work, including:
  - consistent protocols for the assessment of photographic quality, matching of individuals, and inclusion of definite and candidate new whales in the catalogues;
  - arrangements for annual updating (cross-matching of new additions to each catalogue each year);
  - matching of photographs submitted by third parties, if any;
  - scientific questions that could be addressed using the photo-id data;
  - facilitation of collaborative analyses, taking into account questions of protection for data owners.

Experience with other catalogues (e.g. North Atlantic humpback whales, Europhlukes) should be taken into account where relevant.

3. Report back to the WGWAP on the results of the cross-matching, including summary statistics of the matching process, recommendations for further collaboration, and any outstanding issues or problems.

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<sup>3</sup> By catalogue here, we mean the reference set of photographs (best) for each individual. This differs from a database that includes the complete sightings history for each individual along with the photograph(s) used for each agreed resighting and the quality of those photographs.

## Work plan

	Task	Completion
1	Exchange catalogue CD's between the two teams.	mid-January 2007
2	Each team to conduct an initial in-house cross-matching of the catalogues. Results to be reported back to the Task Force, including any comments or questions and indication of any matches considered to be uncertain	mid-February 2007
3	External expert reviews results of each team's cross matching exercise and provides comments and advice, particularly with respect to inclusion and matching criteria, and uncertain matches	mid-March 2007
4	3-day hands-on workshop in Seattle, including persons from each team actively engaged in the photo-id work, plus the external expert under item 3, plus additional task force members as appropriate. The workshop shall resolve any questions arising during steps 1-3 and in particular resolve any doubtful or uncertain identifications. The workshop shall have access to the full sighting histories and photo archives of each team, so that any outstanding matching uncertainties can be resolved. It will consider and if possible make recommendations on a future process or processes	April 2007
5	Report of the Task Force, including the workshop, submitted to GWAP	May 1 2007

*Note: some task force members will be unavailable during May 2007 – the dates are 'pessimistic' and it may be possible to bring forward the schedule if circumstances permit*

### *Contact persons for each team*

Institute of Marine Biology: Olga Tyurneva

Russia-US team: Dave Weller

## Safeguards

Data providers' rights will be protected. No use of the data will be made without the express permission of the data providers. Any use of the data by the GWAP will protect the data providers' rights in accordance with paragraph 3(e) of the GWAP TOR. Any other use of the data will be subject to agreement between the scientists and institutions providing and using the data. The rights of any third parties contributing additional data will be similarly respected. Any external experts engaged to assist with the matching shall assent to these conditions. "Data" includes both photographs and auxiliary information, such as time, date and location of photographs.