

**WESTERN GRAY WHALE ADVISORY PANEL**  
**16<sup>th</sup> meeting**

**WGWAP-16**  
**22-24 November 2015**  
**Moscow, Russia**

**REPORT OF THE WESTERN GRAY WHALE ADVISORY PANEL**  
**AT ITS 16<sup>TH</sup> MEETING**

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

**CONTENTS**

<b>ACRONYMS .....</b>	<b>4</b>
<b>EXECUTIVE SUMMARY .....</b>	<b>5</b>
<b>1 INTRODUCTION .....</b>	<b>7</b>
<b>2 DEBRIEF AND REVIEW OF PRELIMINARY RESULTS FROM 2015 PILTUN-ASTOKH 4D SEISMIC SURVEY .....</b>	<b>8</b>
2.1 Sakhalin Energy’s ‘after-action report’ with ‘lessons learned’ from the Company perspective.....	8
2.2 Chair’s summary of NTF-9 .....	10
2.3 Report of IUCN Independent Observer (IO) of 2015 Sakhalin Energy seismic survey .....	12
2.3.1 Summary of report .....	12
2.3.2 Panel conclusions and recommendations .....	13
2.4 Progress on plans for post-survey data analysis .....	13
2.5 Panel conclusions and discussion regarding Sakhalin Energy 2015 MMP .....	14
<b>3 CONSIDERATION OF STRATEGIES WHEN SIMULTANEOUS OR SAME-SEASON SURVEYS BY MORE THAN ONE COMPANY ARE PROPOSED.....</b>	<b>15</b>
3.1 Presentation on preliminary results of ENL mitigation and monitoring plan (MMP) .....	15
3.2 Panel discussion and conclusions.....	16
3.2.1 Regarding the 2015 ENL operations.....	16
3.2.2 Safety zones and general considerations for source shut-downs to mitigate exposure to intense noise .....	17
3.2.3 Dealing with cumulative issues including multiple surveys.....	18
<b>4 UPDATE ON SAKHALIN ENERGY’S OCEAN BOTTOM NODE (OBN) SURVEY PLANS FOR 2017/2018 .....</b>	<b>18</b>
4.1 Presentation by the Company .....	18
4.2 Panel discussion and conclusions.....	19
<b>5 SAKHALIN ENERGY PROGRESS AND ACTIVITIES REGARDING SHIP STRIKE RISK MITIGATION AND OIL SPILL RESPONSE .....</b>	<b>20</b>
5.1 MMOs and ship strikes .....	20
5.2 Oil spill response planning and drills (incl. rec.WGWAP-14/011 A/B if not completed in 2015 as recommended, and 14/012) .....	20
5.3 Other Sakhalin Energy activities 2015-2019.....	21
<b>6 RESULTS OF 2014 SAKHALIN ENERGY/ENL JOINT PROGRAMME ON GRAY WHALE MONITORING AND RESEARCH AND PRELIMINARY FIELD RESULTS FROM 2015.....</b>	<b>21</b>
6.1 Acoustics (including recommendation WGWAP-13/006) .....	21
6.1.1 General results of 2014 monitoring.....	21
6.1.2 Follow-up on recommendation WGWAP-13/006 .....	22
6.1.3 Hydrology .....	22
6.2 Benthic and hydrology (including rec. 14/010).....	23
6.2.1 Presentation .....	23
6.2.2 Panel discussion and conclusions.....	23
6.3 Photo-ID.....	24
6.4 Biopsies and genetic studies.....	24
6.5 Distribution .....	25
6.5.1 Presentation .....	25
6.5.2 Panel discussion and conclusions.....	25
6.6 Results of integrated analysis .....	25
6.6.1 Presentation .....	25
6.6.2 Panel conclusions and recommendations.....	26
<b>7 REVIEW OF 2014 FIELDWORK RESULTS, PRELIMINARY 2015 RESULTS, AND 2016 SCOPE OF WORK.....</b>	<b>26</b>
7.1 Oil spill response planning and drills (incl. rec WGWAP-14/011 A and B) .....	26
7.2 Joint Programme preliminary 2015 results.....	26
7.2.1 Presentation .....	26
7.2.2 Panel discussion and conclusions.....	27
7.3 Scope of work for 2016 and plans for 2017 .....	28
7.3.1 Presentation .....	28
7.4 Overall Panel discussion and conclusions.....	28
7.5 Research activities and observations by other groups .....	28
7.5.1 Report of 2014 and 2015 seasons, Russia-US team .....	28
7.5.2 Other Sakhalin observations .....	29
7.5.3 Kamchatka .....	29
7.5.4 Records of gray whales elsewhere in the western North Pacific .....	29

## REPORT OF THE 16<sup>TH</sup> MEETING OF THE GWAP (GWAP-16)

<b>8 POPULATION ASSESSMENT &amp; RELATED MATTERS .....</b>	<b>29</b>
8.1 IWC Scientific Committee work on stock structure .....	29
8.2 Progress on cross-matching between the IBM and Russia-US photo-ID catalogues.....	30
8.3 Update on population assessment 2014.....	30
8.4 Plans for update of joint population assessment.....	32
<b>9 ADDRESSING CUMULATIVE &amp; RANGE-WIDE ISSUES .....</b>	<b>32</b>
9.1 Update on Guidelines for Monitoring and Instructions for Mitigation Measures for Large Cetaceans during Industrial Activities on the Shelf of the Russian Federation Far Eastern Seas .....	32
9.1.1 Presentation .....	32
9.1.2 Panel discussion and conclusions.....	33
9.2 Update on US guidelines for acoustic thresholds of disturbance.....	33
9.3 Update on IWC disentanglement training programme .....	33
9.4 Oil and gas activities on Sakhalin Shelf other than those of Sakhalin Energy .....	34
9.4.1 Presentation .....	34
9.4.2 Panel discussion and conclusions.....	35
9.5 Population Consequences of Disturbance .....	35
9.6 Update on fisheries activities off Sakhalin in 2015 and beyond.....	36
9.6.1 Presentation .....	36
9.6.2 Panel discussion and conclusions.....	36
9.7 Update on cruise ship visits to Piltun .....	36
9.8 IWC Memorandum of Cooperation on Western Gray Whale Conservation: Status, plans to update and expectations from the Panel .....	37
9.9 Update on gray whale tagging plans and general updates on new information on tag design, health impacts etc.....	37
<b>10 GWAP PLANS FOR 2016 AND BEYOND.....</b>	<b>38</b>
10.1 Review of GWAP recommendations.....	38
10.2 GWAP workplan 2016 .....	38
10.2.1 Context: International Finance Corporation (IFC) Performance Standards on Environmental and Social Sustainability..	38
10.2.2 Proposed 2016 workplan.....	39
10.3 Panel discussion and conclusions .....	40
<b>11 REFERENCES .....</b>	<b>41</b>
<b>12 SUMMARY OF RECOMMENDATIONS FROM THE 16<sup>TH</sup> MEETING OF THE GWAP.....</b>	<b>42</b>
<b>ANNEX 1. LIST OF PARTICIPANTS.....</b>	<b>49</b>
<b>ANNEX 2. FINAL MEETING AGENDA .....</b>	<b>51</b>
<b>ANNEX 3. LIST OF DOCUMENTS.....</b>	<b>55</b>

## REPORT OF THE 16<sup>TH</sup> MEETING OF THE WGWAP (WGWAP-16)

### ACRONYMS

ADB tag	Advanced Dive Behaviour tag
AIC	Akaike Information Criterion
AUAR	Automated Underwater Acoustic Recorder
CI	Confidence Interval
Company	Sakhalin Energy Investment Company
DTAGs	Digital Acoustic Recording Tag
EIA	Environmental Impact Assessment
ENL	Exxon Neftegas Limited
E&P	Exploration and Production
FA	Fatty Acids
FEB RAS	Far East Branch, Russian Academy of Sciences
FRC	Fast Rescue Cutter
GEF	Global Environment Facility
IBM	Institute of Marine Biology
IFC	International Finance Corporation
IO	Independent Observer
IUCN	International Union for Conservation of Nature
IWG	Interdepartmental Working Group on the Conservation of the Okhotsk-Korean (Western Gray) Whale Population (IWG) of the Russian Federation
IWC	International Whaling Commission
JIP	E&P Sound and Marine Life Joint Industry Programme
Joint Programme	Sakhalin Energy/ENL Joint Programme on Gray Whale Monitoring and Research
M-C	Mother-Calf
MMO	Marine Mammal Observer
MMP	Monitoring and Mitigation Programme
MMPP	Marine Mammal Protection Plan
MNR	Ministry Of Natural Resources and Ecology of the Russian Federation
NGO	Non-Governmental Organization
NOAA	National Oceanic and Atmospheric Administration (US)
NTF	Noise Task Force
OBN	Ocean Bottom Node
Panel	Western Gray Whale Advisory Panel
PCoD	Population Consequences of Disturbance
Photo-ID	Photo Identification
POI	Pacific Oceanological Institute
PML	Perimeter Monitoring Line
PS	IFC Performance Standard on Environmental and Social Sustainability
PTS	Permanent Threshold Shift
RHIB	Rigid Hull Inflatable Boat
RMS	Root-Mean-Square
RPN	Federal Service of the Supervision of the Natural Resource Usage of the Russian Federation (Rosprirodnadzor)
Sakhalin Energy	Sakhalin Energy Investment Company Ltd.
SEL	Sound Exposure Level
SI	Stable Isotopes
SP	Shot Point
SPL	Sound Pressure Level
SVV	Sound Source Verification
ToR	Terms of Reference
TTS	Temporary Threshold Shift
UNDP	United Nations Environment Programme
VNIRO	Russian Federal Research Institute of Fishery and Oceanography
WGW	Western Gray Whale
WGWAP	Western Gray Whale Advisory Panel

## EXECUTIVE SUMMARY

The 16<sup>th</sup> meeting of the Western Gray Whale Advisory Panel (GWAP) was held in Moscow, Russian Federation, from 22 to 24 November 2015. It was immediately preceded by the 9<sup>th</sup> meeting of the Noise Task Force (NTF) at the same venue.

Carbone, Deputy Director of IUCN's Global Business and Biodiversity Programme, welcomed participants and summarized changes in the Panel's structure, procedures and composition since GWAP-15. The Panel Co-chairs (Reeves and Donovan) took note of the welcome news that gray whales off Sakhalin continued to increase through 2014 and they again expressed their hope that the species would eventually be able to re-occupy its historically extensive range in East Asia.

The first part of the meeting reviewed Sakhalin Energy's 2015 Piltun-Astokhskoye 4D seismic survey and implementation of the Company's associated Monitoring and Mitigation Plan (MMP). Presentations included (1) the Company's perspective on MMP effectiveness, difficulties encountered and lessons learned, (2) a summary by the NTF Chair (Donovan) on the deliberations and recommendations of NTF-9 and (3) the report of the IUCN Independent Observer (Tsidulko) of his first-hand observations while in the field during the seismic survey and his conclusions and recommendations based on those observations.

The Panel was also pleased to receive a presentation by an Exxon Neftegaz Limited (ENL) representative on that company's 2015 seismic survey programme and associated MMP. A major complicating factor of the 2015 open-water season at Sakhalin had been the decision by Sakhalin Energy and ENL to conduct their respective seismic survey programmes in the same season, requiring staggered timing. The two companies agreed that the ENL survey of the Odoptu license area would take place first (this survey would introduce considerably greater energy into the feeding area than the Sakhalin Energy survey). The Sakhalin Energy survey (originally planned to start as soon as ice conditions allowed) could not begin before that survey had been completed, i.e. before very late June or early July by which time relatively large numbers of gray whales normally have arrived in the Piltun area.

The Panel **acknowledged** the great efforts of field personnel to implement the monitoring component of the MMP under difficult conditions but recognised that some of the difficulties encountered may affect the analyses that can be undertaken and the importance of analyses that incorporate the data collected by both companies. It therefore **recommended** that Sakhalin Energy provides information (well before the next scheduled NTF meeting) on (a) the quantity of data available from Sakhalin Energy, (b) the quality of the data and its consistency over time, especially with respect to the behavioural teams and (c) the availability of data from the ENL survey and the Sakhalin Energy/ENL Joint Programme.

The Panel **agreed** that the Company 'implemented satisfactorily' the mitigation component of the final Company MMP, despite some initial technical difficulties. It **recommended** that, ideally prior to the next NTF meeting, the Company examines the existing data to investigate what the effect would have been on the time taken to complete its 2015 survey if the criteria for behavioural shutdowns had been applied to all whales, and not just mother-calf (M-C) pairs, and if no A-lines had been acquired at night. be available.

Concerning any future seismic surveys conducted in or near the gray whale feeding areas off north-eastern Sakhalin, the Panel **recommended** that: (a) the Independent Observer (IO) role continues; (b) the Company improves field planning, recruitment, equipment testing and training and that it works more closely, and much farther in advance of future seismic surveys, with the Panel and NTF towards that end; and (c) that the issue of how to manage multiple seismic surveys in and near the Sakhalin gray whale feeding areas be given priority on the NTF's agenda.

The Panel expressed appreciation for the early engagement with Sakhalin Energy concerning the Company's anticipated seismic survey in 2018 and stressed the importance of advanced planning to avoid problems encountered with the 2015 survey. It **emphasised** the importance of improved collaboration amongst companies, specifically when it comes to (a) sharing plans for future seismic surveys in a timely fashion; (b) sharing data to improve understanding of effects of noise on whales; and (c) developing common approaches to MMPs, taking cumulative exposure into account.

Concerning acoustic issues more generally, the Panel **recommended** that Sakhalin Energy (a) calculates cumulative acoustic exposure (5-minute averaged sound exposure level for three specified frequency bands

## REPORT OF THE 16<sup>TH</sup> MEETING OF THE GWAP (GWAP-16)

in the gray whale feeding area using the data recorded by all deployed bottom-mounted receivers and (b) outlines a strategy for addressing issues related to control sites for acoustic monitoring. The Panel also **recommended** that more time is made available at the next NTF meeting to consider noise issues beyond the ongoing matters related to seismic surveys.

The Panel discussed a number of aspects related to the tagging of gray whales. It **recommended** that prior to further use of implantable tags in Sakhalin: (a) the next NTF meeting provided an overview of the use of behavioural tags; and (b) arrangements are made for the two photo-ID teams to assemble photographs of tag implantation sites and 'wounds' of the seven animals that were tagged at Sakhalin, for examination by an independent team of experts.

Regarding other matters discussed at the meeting, the Panel made several **recommendations** to Sakhalin Energy regarding (a) the ship strike risk from the Company's proposed increase in the speed limit for crew change vessels; (b) provision of existing biochemical data on whale tissue and prey and further isotopic analysis of gray whale samples and prey to provide information on gray whale feeding ecology; (c) preparation for a comprehensive analysis of the Sakhalin Energy/ENL Joint Programme's 16-year dataset on distribution; (d) linking the IBM photographic catalogue with the animals biopsied by the Sakhalin Energy/ENL Joint Programme and documenting problems; (e) facilitating use of all photo-ID data in assessments by updating matching of the two catalogues and providing a definitive version of the Institute of Marine Biology (IBM) catalogue, ideally back to 2002; (f) see if information on gray whale response to salmon fishing gear is present when analysing the distribution and behaviour data.

The Panel welcomed an updated population assessment of the Sakhalin gray whale population by Cooke. The estimated number of mature females in 2015 was 44 individuals (95% confidence interval (CI) 38-49). The total non-calf population was 174 (95% CI 158-191) or 186 (CI 171-203) depending on assumptions. The population has been growing at an average rate of 3.8% per year (CI 2.8-4.8%). Forward projections, on the assumption that average conditions remain unchanged, predict a continued increase.

Finally, it was anticipated that the Panel's 2016 workplan would include two major new elements, one being to support Sakhalin Energy's efforts to comply with the International Finance Corporation's (IFC) Performance Standards (PS) on Environmental and Social Sustainability, and the other being to engage with the Company on its consideration of possible changes to the Sakhalin Energy/ENL Joint Programme that would be implemented in 2018. The workplan was also expected to include, among other things: a review of Sakhalin Energy's revised Marine Mammal Protection Plan (MMPP); continued development of a strategy for addressing potential conflicts between Sakhalin gray whales and fisheries; continued development of a strategy for improving understanding of ecological drivers for productive gray whale feeding areas off Sakhalin; production of a 'good practices' publication with guidelines for marine seismic surveys, updating and expanding upon Nowacek *et al.* (2013); helping to revise and update the IUCN/IWC Conservation Management Plan for Western Gray Whales; and reviewing and commenting on the UNDP/GEF Methodological Guidelines for Monitoring and Mitigation of Impact on Large Cetaceans during Industrial Activities in the Internal Seas, the Continental Shelf and the Exclusive Economic Zone of the Russian Federation.

## 1 INTRODUCTION

The sixteenth meeting of the Western Gray Whale Advisory Panel (GWAP-16) was held at the World Trade Centre (Congress Centre) in Moscow, Russian Federation, from 22-24 November 2015. The meeting was co-chaired by R.R. Reeves and G.P. Donovan. GWAP-15 was limited to a teleconference held on 8-9 December 2014 to consider final recommendations concerning Sakhalin Energy's 2015 Piltun-Astokh 4D seismic survey. The full Panel also participated in a "working meeting" in Gland, Switzerland from 22-24 April 2015 with representatives of the International Union for Conservation of Nature (IUCN) and Sakhalin Energy Investment Company Ltd (hereafter Sakhalin Energy or Company) and a number of Observers<sup>1</sup>. Also, the ninth meeting of the Noise Task Force (NTF-9) had taken place in Moscow immediately before GWAP-16 (19-20 November 2015).

Carbone opened the meeting with a message of welcome from IUCN. She noted that a number of changes had taken place in the Panel structure and composition since GWAP-15, in response to the recommendations of the external independent evaluation (2014) and in accordance with the IUCN Procedures for Establishing and Managing IUCN-supported Independent Scientific and Technical Advisory Panels (ISTAP, 2014), as well as in agreement with the Chair. Reeves and Donovan were appointed by IUCN to serve as Panel co-chairs through 2016. The rest of the Panel was dissolved effective 30 September 2015 and positions re-advertised, based on the Terms of Reference (ToR) developed closely with Co-chairs, with input from the "working meeting" participants (April 2015)<sup>2</sup>. The reconfigured Panel, expected to serve through 2016, was established following a call for membership applications in July-August 2015 and a selection process led by IUCN in mid-September 2015. The current Panel of ten members (in addition to Reeves and Donovan) includes five previous members (Cooke, Nowacek, Tsidulko, Vedenev and Weller) and five new members (Burdin, Linden, Lowry, Pomerleau and Southall) (see Annex 1 for contact information). In addition, Alexey Yablokov, a longtime Panel member, has agreed to serve as an emeritus member. Unfortunately, Yablokov was unable to attend the Moscow meeting due to illness. Also, Weller was unable to attend because of problems obtaining a Russian visa.

Representatives of several organizations also attended the meeting as Observers, including various officials from the Russian Federation and Sakhalin Oblast governments, Lender representatives, representatives of Exxon Neftegas Limited (ENL) and several non-governmental organizations (NGOs) (for details see Annex 1). The Panel was pleased by the large number of Observers who attended the meeting, or at least parts of it, and emphasised once again that it places great importance on their participation and support.

Berzina and Carbone of IUCN facilitated meeting preparations and logistics. Simon Delany served as rapporteur. Interpreters Alexander Danilov and Viacheslav Chudinov provided simultaneous Russian-English translation. The Panel sincerely appreciates the efforts by all of these individuals as they helped make this a successful meeting.

In their opening remarks, the co-chairs again acknowledged the welcome evidence that gray whale (*Eschrichtius robustus*) numbers off Sakhalin are continuing to increase. Continuation of this trend, with the hope that it will contribute to gray whales re-occupying their historically extensive range in East Asia, is GWAP's *raison d'être* and it is a goal presumably shared by all who participate in the GWAP process.

The meeting agenda is given in Annex 2 and the list of documents in Annex 3. Those documents designated as public are available on the GWAP website.<sup>3</sup> Regarding documents, the Panel expressed its appreciation to Sakhalin Energy for ensuring that all documents were available well in advance of the meeting, and also to IUCN for endeavouring to provide Panel members with quick and convenient access to the documents.

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<sup>1</sup> See the GWAP Working Meeting report at [http://www.iucn.org/gwap/gwap/meetings/gwap\\_wm](http://www.iucn.org/gwap/gwap/meetings/gwap_wm)

<sup>2</sup> Ibid

<sup>3</sup> [http://cmsdata.iucn.org/downloads/gwap\\_16\\_3\\_final\\_document\\_list.pdf](http://cmsdata.iucn.org/downloads/gwap_16_3_final_document_list.pdf)

## **2 DEBRIEF AND REVIEW OF PRELIMINARY RESULTS FROM 2015 PILTUN-ASTOKH 4D SEISMIC SURVEY**

### **2.1 Sakhalin Energy's 'after-action report' with 'lessons learned' from the Company perspective**

The Company provided the following general overview of the 2015 survey (confidential document NTF-9/3 and the forthcoming NTF-9 report).

As part of its reservoir management strategy, Sakhalin Energy has conducted 4D seismic surveys to monitor oil and gas extraction and water injection. A 4D survey obtains an up-to-date seismic image of producing reservoirs. This image can be compared against baseline survey images to illustrate changes happening over time. In 2010 a 'pilot' survey was recorded across the Astokhskoye area of the Piltun-Astokhskoye field. Following this successful pilot survey, the Company surveyed all of its assets with the 2015 4D seismic survey. For the purpose of the discussion below, the following objectives for the 2015 Piltun-Astokhskoye 4D seismic survey were defined:

- (1) Acquire 36 seismic survey lines in 4D mode across the Piltun-Astokhskoye license area, within budget and time, without incidents, while recording data suitable for reservoir monitoring purposes (the precise business objectives are not covered here);
- (2) During acquisition, protect marine mammals, with an emphasis on gray whales, by:
  - a. implementing the Company's 2015 Monitoring and Mitigation Plan (MMP)<sup>4</sup> to the best of Company's ability and;
  - b. honouring commitments made in the Russian Federation Environmental Impact Assessment (EIA) for the project;
- (3) Be transparent to the external world about what the Company does, by:
  - a. supporting the IUCN Independent Observer (IO) to monitor and report on field activities in line with agreed Terms of Reference and Communications Protocol;
  - b. producing the international EIA, submitting the document for approval and then publishing it on the Company's public website;
  - c. sharing the report of the 4D survey with the Interdepartmental Working Group for the Conservation of the Okhotsk-Korean (Western) Gray Whale Population (IWG) and Russian Federation stakeholders in due time.

In the MMP, the Company committed to starting the 4D survey at Piltun-Astokhskoye as early as possible, with the practical limitation that ENL was recording a 3D survey in the adjacent Odoptu license in June-July 2015. ENL finished its 3D survey at Odoptu on 7 July 2015. Sakhalin Energy recorded the first shot point (SP) at Piltun-Astokhskoye on 8 July.

The Piltun-Astokhskoye survey consisted of 36 lines, with 23 lines classified as 'A-lines' according to the MMP, of which 13 were north-headed closest to shore. Thirteen lines were classified as 'B-lines'. The 13 north-headed A-lines were finished on 21 July. The remaining A-lines were finished on 25 July. The entire survey was completed on 29 July after 21 days. Summary statistics are provided in Table 1.

Due to the actual start date, tides were unfavourable (in terms of 'streamer feathering'<sup>5</sup> problems) with respect to carrying out A-lines only during daylight as originally envisioned during previous NTF meetings. In practice, the alternatives were to wait until later in the month when the tides were more favourable which would have prolonged the survey further into the peak whale period or to follow the 'dusk scan' approach and allow shooting at night. The Company chose this latter option that led to almost half of the A-lines being shot at night.

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<sup>4</sup> See at [http://cmsdata.iucn.org/downloads/mmp\\_2015\\_piltun\\_astokh\\_4d\\_seismic\\_en.pdf](http://cmsdata.iucn.org/downloads/mmp_2015_piltun_astokh_4d_seismic_en.pdf)

<sup>5</sup> Feathering: The lateral displacement of streamers due to the action of tides and currents such that they do not tow directly behind the survey vessel but rather deviate laterally from the ship track or nominal sail line. (Paraphrased from International Association of Oil & Gas Producers, 2011).



REPORT OF THE 16<sup>TH</sup> MEETING OF THE GWAP (GWAP-16)

Item	Entire Survey	North-headed A-lines
Survey lines (pre-plot, no platforms)	36	13
Minimum number of passes	43	13
Actual number of passes	60	17
Minimum number of shot points	64,152	20,023
Actual number of shot points	80,407	24,630
Number of shot points taken multiple times	16,255	3,607

**Table 1.** Summary statistics from the 2015 seismic survey

Following completion of the 3D survey at Odoptu, the seismic vessels contracted by ENL moved to Chayvo and Arkutun-Dagi, south of Piltun-Astokhskoye. These vessels were actively collecting seismic data in the area for the entire duration of the Piltun-Astokhskoye survey and beyond. Good coordination of the vessel schedules between the companies was established. The net standby for the Sakhalin Energy work as a result of time sharing with ENL was limited to 20.6 hours.

During the Sakhalin Energy survey there were five sound source suspensions, all due to marine mammals in the source exclusion zone as applicable for that particular type of mammal as defined by the Russian Federation regulations (Table 2). For logistical reasons (including turn strategies), shutdowns cause an average of around 5 hours downtime.

Date	Mammal	Applicable Exclusion Zone
12-July	Harbour porpoise	1km
19-July	Common minke whale	2km
20-July	Pinnipeds	350m
22-Jul	Common minke whale	2km
22-Jul	Pinnipeds	350m

**Table 2.** Summary of shutdowns

Exclusion zones for cetaceans around seismic surveys are often determined by modelling the range at which received signals are estimated to be 180 dB re 1  $\mu$ Pa rms SPL or higher. For the Sakhalin Energy survey, a conservative interpretation of this value from sound propagation modelling was a 1.6 km radius around the array and the original plan was to confirm this in the field with the ‘sound source verification’ (SSV) experiment at the start of the survey. However, the Russian Federation’s State Environmental Expert Review established an exclusion zone of 2km for gray whales prior to the survey and for this reason the Company decided there was no need to conduct the SSV experiment. There were no suspensions of operations due to the presence of gray whale mother-calf (M-C) pairs during the survey. The total standby time logged due to marine mammals was 24.9 hours. It should be noted that the first (test) line acquisition was suspended because a suspected M-C pair was sighted and determined by the Central Commander to be within or about to reach the modelled boundary of behaviourally relevant sound exposure. This sighting, however, was subsequently determined in the field to be inaccurately identified and was thus discounted in the final tally.

Although not considered technically optimal by the Company, it decided that rather than completely reshooting whole lines when technical problems arose or shutdowns occurred, partial lines (segments) would be shot whenever possible to reduce the overall survey time. This compromise was agreed with the seismic contractors after NTF-8 and GWAP-15 (when it had been assumed that whole line reshoots would be normal).

In terms of the objectives stated above, the Company believes that these were achieved. The MMP was implemented in the field to an acceptable standard. The IUCN IO was hosted at the Central Command post during the survey. The international EIA was prepared and finalised by Mike Donaghy Associates Ltd. and

published on the Company website. In addition, the 2015 4D seismic survey (and MMP) at Piltun-Astokhskiye was conducted successfully in that (a) the start date was as early as practically possible given the simultaneous geophysical operations in neighbouring licenses; (b) the survey was completed in a relatively short time, close to what could have been expected as the minimum, based on pre-survey simulations; and (c) the MMP was implemented in the field to an acceptable standard, overcoming some setbacks as outlined in the appendix in the forthcoming NTF-9 report that provides a detailed summary of the Company's evaluation of its performance in implementing the MMP provisions (Annex X, Appendix 1).

## 2.2 Chair's summary of NTF-9

The NTF-9 meeting was held in Moscow from 19-20 November 2015 and there was insufficient time to complete the report before the Panel meeting. What follows is therefore a summary of that meeting by its Chair (Donovan) which was not formally agreed by the NTF members.

Efforts to develop an MMP for the 2015 survey began at NTF-5 in October 2013 when it was agreed that the basis of the MMP would be that developed for the 2010 survey. It was not until October 2014 at NTF-7 that the first information was received that ENL intended to carry out a major seismic survey in adjacent waters in the same year. After considerable effort, NTF-8 in November 2014 produced its final report on the 2015 survey and proposed an MMP, although noting that additional logistical work (especially with respect to training of personnel and testing of equipment and protocols) was required. This report was submitted to the Panel which developed its recommendations in December 2014 at GWGAP-15 (a 'virtual' meeting). Those recommendations and the Company's responses are posted on the GWGAP website<sup>6</sup>. The Panel also provided a statement of concern on 8 May 2015 (and a supplementary technical note on 16 May 2015) and the Company's response was provided on 25 May 2015. These are also available on the GWGAP website<sup>7</sup>.

Before presenting his summary of the discussions, Donovan reiterated that NTF meetings are technical workshops not Panel meetings – therefore the focus of NTF-9 was on technical matters related to (a) implementation of the Company's MMP, (b) lessons to be learned for the future, (c) initial consideration of any available results and (d) future analyses of data obtained in 2015. Although an extremely important topic, the NTF had not discussed matters related to the combination of operations by Sakhalin Energy and ENL, noting that this was more relevant to the Panel meeting and also that there was no information available to the NTF from ENL. It was anticipated that some information would be provided by ENL at the Panel meeting.

The NTF noted that the only change to the MMP developed at NTF-8 and agreed by the full Panel at GWGAP-15 was that if the survey went ahead, relaxation of the 2010 behavioural shutdown rule such that it would apply only to M-C pairs rather than to all gray whales, was applicable only until 15 July (by which time the Panel estimated that around 75% of the animals would have arrived in the Piltun feeding area).

With respect to the Company, the changes incorporated in its final MMP from the MMP recommended by the Panel related to completing the survey as quickly as possible whilst taking into account the agreement with ENL:

- (1) *Date for behavioural shutdowns* – to apply to all whales after 1 August not 15 July;
- (2) *Start date* – not ice melt but completion of the ENL Odoptu survey;
- (3) *Exclusion zone* – exclusion zone for gray whales was set at 2km (following Russian Federation regulations) rather than estimated in the field;
- (4) *Mitigation gun usage* – not used during the Piltun Astokh survey;

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<sup>6</sup> The GWGAP-15 recommendations and the initial Sakhalin Energy response of December 2014 [http://cmsdata.iucn.org/downloads/report\\_gwgap\\_15\\_15\\_dec\\_2014\\_final\\_recs\\_summary\\_w\\_Sakhalin\\_Energy\\_response\\_v2.pdf](http://cmsdata.iucn.org/downloads/report_gwgap_15_15_dec_2014_final_recs_summary_w_Sakhalin_Energy_response_v2.pdf) with subsequent updates to the response in 2015 available on the GWGAP Recommendations Database: <http://ow.ly/Xj1os>

<sup>7</sup> [http://iucn.org/gwgap/gwgap/meetings/gwgap\\_wm/](http://iucn.org/gwgap/gwgap/meetings/gwgap_wm/)

## REPORT OF THE 16<sup>TH</sup> MEETING OF THE GWAP (GWAP-16)

- (5) *Shooting A-lines in poor visibility* – allowed if pre-dusk scan undertaken to confirm no M-C pairs in the A zone (rather than shooting all A-lines in good visibility conditions as in the Panel MMP).

For its review of the implementation of the survey, the NTF had three valuable sources of information:

- (1) the Company's Central Commander's report;
- (2) the Company's overview;
- (3) the report of the IUCN IO.

The NTF-9 review was broadly separated into consideration of the mitigation component and the monitoring component, although aspects of these are related.

### *Mitigation component*

Overall the NTF concurred with the Company and the IO that despite some initial technical difficulties, the mitigation component *as specified in the final Company MMP* was 'implemented satisfactorily' in that the shutdown procedures were followed efficiently and effectively, A-lines were completed more quickly than had been anticipated and the Advisory Group established by the Panel to provide rapid advice during the survey worked well.

However, a number of important lessons were identified. These related primarily to the use of new technology under poor visibility conditions, problems with acoustic equipment with respect to choice of model variants, and number of and scheduling times for Marine Mammal Observers (MMOs) on-board vessels.

There was considerable discussion (from NTF-5 onwards) about the use of 'blended-vision' technology (infrared and active sonar) to improve whale detections, especially under poor/no visibility conditions. The potential value of this was recognised by the NTF and the Panel but it was recommended that before such technology is adopted, formal evaluations need to be conducted under field conditions. It was noted that problems could arise due to false positives as well as false negatives. Although the blended-vision equipment was purchased and installed, only a qualitative evaluation of its effectiveness was made during 2015, and this was based solely upon MMO preferences from their experience at Lunskeye where no whale sightings were made during the trials. The NTF agreed that it was essential for a quantitative evaluation to be made before any future seismic survey, following the Panel's previous recommendations.

An important component of the MMP was to ensure that whales (initially the focus was on M-C pairs) were not subject to ensonification beyond the behavioural threshold. Determination of this relies on a combination of the JASCO model (and offset variants) and verification by real-time data obtained from buoys along the perimeter monitoring line (PML). The MMP identified the number and positioning of buoys (and what to do if they failed) but equipment failure meant that the full number was not available. The NTF noted that real-time examination of data from available buoys showed that, on this occasion, the model was sufficient for mitigation purposes, particularly as the M-C pairs were all close to shore. However, the NTF agreed that it was essential in the future that (1) full field testing of complete systems occurs well before future surveys begin; (2) sufficient backup equipment is available; and (3) experienced acoustic engineers are available to conduct or oversee equipment installation and fully tested installation protocols are developed well before operations. The NTF recognised that with respect to (3), the problem in 2015 was not related to the lack of an experienced engineer but rather to human error and the lack of a fail-safe mechanism to ensure proper installation.

Finally, with respect to mitigation, the NTF agreed that (as had been recommended by the NTF and the Panel prior to this survey) there needs to be early consideration of the number of offshore MMOs, their duties (including use of new technology) and their time schedules.

### *Monitoring*

The NTF agreed that exceptional efforts had been made by the field personnel to implement the monitoring component in difficult conditions. However, it noted that not all aspects of monitoring had been undertaken in full accord with the MMP. In particular, with respect to the behaviour and distribution monitoring, much of the time during the pre-seismic week (which is extremely important for detecting whether any change

occurred as a result of the survey) was spent training, obtaining information on and clarifying protocols, and solving equipment problems. In addition to severely limiting the amount of pre-seismic survey data obtained, this learning period and the inevitable improvement in performance of observers over time may create analytical difficulties in being able to assume that the data have been collected in a consistent manner.

The NTF noted that a number of the difficulties encountered could have been minimised if recommendations made from NTF-6 onwards had been implemented more promptly, particularly with respect to the early selection of behavioural team leaders and the need for sufficient time to train behavioural MMOs (e.g. see NTF-6, Item 5.4). It reiterated that the observers for behavioural studies require considerable training and experience. However, it also recognised the difficulties in recruitment of qualified observers due to the similar behavioural and other monitoring undertaken by ENL in 2015. The NTF agreed that such problems must be avoided in the future. This is essential if a better understanding of the effects of seismic surveys on gray whales is to be obtained. Such understanding will lead to improved mitigation in the future. The NTF reiterated that in the future, experienced team leaders should be appointed well in advance and ideally be in the field the year before to gain familiarity with (1) protocols, (2) software/hardware, (3) classification of behaviour and (4) local conditions. It was also suggested that it could be valuable to hold refresher courses at either Yuzhno or in the field camp before the pre-seismic observation effort begins.

### *General*

Overall, the NTF agreed that Company field personnel made every effort to implement the MMP. Given the complexity of the operations and the remoteness of the area, the NTF recognised that there will always be a need for some *in situ* fixes, and thus it commended the efforts of all concerned. That being said, it also agreed that it was essential to learn lessons in order to minimise problems in the future, especially in terms of field planning, recruitment, testing and training.

In particular, the NTF expressed its appreciation to the IUCN IO (Tsidulko) and to the Company for the support extended to him. It is clear from both the IUCN IO's report and the Company's Central Commander's report that there was excellent co-operation between them and that the IO provided valuable technical advice and assistance beyond his role as an observer. The NTF agreed that the IO role will be important in future surveys and suggested that it be extended to cover the full MMP period, recognising that Terms of Reference and recruitment for the role are the responsibility of IUCN.

Regarding any modifications to future MMPs, the NTF agreed that it was premature to consider major changes until data analyses from 2015 were completed. Any proposed changes will require review in the light of (1) the new data and analyses including analyses of potential cumulative effects and incorporation of data from all years, (2) details concerning the nature of specific surveys, (3) evaluations of new technology, (4) the relative costs of different approaches and (5) benefits to whales.

The importance of data analyses was stressed by the NTF but it was recognised that only preliminary information on the data was available given the short time between the end of seismic survey and the NTF-9 meeting. Although it was possible to agree on some further work regarding acoustic data, other discussions must await more information.

In conclusion, the NTF noted that 2015 represented the largest level of seismic survey activity ever on the Sakhalin shelf and the largest monitoring effort. To obtain maximum benefit from the experience gained and data collected, joint analyses with ENL are essential. The NTF recognised the difficulties inherent in this but emphasised that such analyses should benefit all and lead to improved mitigation in the future. It strongly suggested that an expert group from both companies meet to discuss the nature and objectives of such analyses and develop mechanisms and safeguards for data holders to facilitate them.

## **2.3 Report of IUCN Independent Observer (IO) of 2015 Sakhalin Energy seismic survey**

### *2.3.1 Summary of report*

The report of the IUCN IO, Tsidulko, was discussed fully at the NTF-9 meeting and provided an important component of the review process. Only a short overview is provided here.

Overall, the IO noted that significant effort was undertaken by Sakhalin Energy to facilitate his work at the Temporary Whale Observation Camp throughout the observation period and to enable him to obtain a

comprehensive overview of the onshore component of the MMP. He thanked Company personnel for their help and support. He noted that it would be helpful in the future for the IO to be able to communicate directly with offshore personnel at times when it would not interfere with their primary responsibilities. He also suggested that additional consideration be given prior to the survey to the logistics of IO transportation and permits (e.g. safety certificates) needed to undertake visits to all onshore stations, recognising the need for full compliance with Company safety standards.

With regard to mitigation, he noted that from his land-based perspective, the mitigation effort appeared sufficient, and the mitigation aspects of the MMP had been fully and successfully implemented. He stressed the importance of the Company giving serious consideration to improvements related to equipment and gear, including that available to the offshore MMOs, in the future. He also identified some positive lessons and potential solutions with respect to A-line acquisition in poor visibility that could be incorporated into future surveys and mitigation planning.

With regard to monitoring, he noted the willingness of field personnel to overcome difficulties encountered initially. However, he highlighted a number of areas that could be improved in the future, particularly related to ensuring that the specific goals, objectives and methods of the monitoring are better understood by all involved in the planning stages, so that these would be accounted for in personnel and equipment selection and in training.

He concluded that it is important to recognise that each survey is different, and that the MMP needs to be developed taking account of the specific circumstances and conditions, as had been the case in 2015.

#### *2.3.2 Panel conclusions and recommendations*

The Panel joined the NTF in thanking Tsidulko for his excellent work and thanking the Company for the support extended to him. In addition to his formal duties, Tsidulko provided valuable technical advice and assistance to the Company in the field. The Panel **recommends** that the IO role continues to be part of future seismic surveys. Ideally, the IO's time in the field should be extended to cover the full MMP implementation period. The Panel recognises that the ToR and recruitment are the responsibility of IUCN and draws attention to the added value that was gained from having an IO who had participated in the relevant NTF and Panel discussions during the MMP development process.

#### **2.4 Progress on plans for post-survey data analysis**

The Panel stressed the importance of undertaking thorough analyses as soon as practical but concurred with the view of the NTF that it was premature to develop detailed plans for future analyses until better information was available on: (a) the quantity of data available from Sakhalin Energy; (b) the quality of the data and its consistency over time (both within the 2015 season as discussed under Item 2.2 and amongst 2010, 2012 and 2015), especially with respect to the behavioural teams; and (c) the availability of data from the ENL surveys (see Item 3) and the Sakhalin Energy/ENL Joint Programme.

The Panel **recommends** that the Company provides such information, initially in some summary or synthesis form as soon as it becomes available and certainly well before the next scheduled NTF meeting. Upon receipt, the Panel may request additional information if it feels this will assist discussions in the NTF towards developing detailed plans for analyses.

The Panel endorses the idea of representatives from both companies meeting to discuss the nature and objectives of such analyses and develop mechanisms and safeguards for data holders to facilitate the analyses. Further, the Panel is willing to participate in such an exercise if such participation is seen as useful.

Some work can begin, using the information already available to Sakhalin Energy. The Panel concurs with the NTF-9 recommendation for work that can be undertaken immediately to calculate cumulative acoustic exposure in the gray whale feeding area using the received level data recorded by all of the deployed bottom-mounted receivers. It therefore **recommends** that the Company arranges that for all available sensors for all time periods, the 5-minute averaged sound exposure level (SEL) is calculated for the following frequency bands: 10-100 Hz, 10-1000 Hz, 10-15000 Hz (or up to the Nyquist frequency). Although immediate analyses of potential impacts may focus on areas where visual data were collected (e.g. whale distribution), undertaking the calculations for all sensors should entail only a minor addition of time since the time-consuming step is setting up the analyses in the first place. Furthermore, having these data from all sensors

in the area will be useful for future analyses of potential impacts on an annual basis. This work should be accomplished before the next NTF meeting.

The Panel also **recommends** that, ideally prior to the next NTF meeting, the Company examines the existing data to investigate what the effect would have been on the time to complete the Sakhalin Energy survey if the criteria for behavioural shutdowns had been applied to all whales, and not just M-C pairs, and if no A-lines had been acquired at night. The Panel is willing to assist the Company in this exercise, or indeed to carry it out, should sufficient resources be available.

Finally, the Panel emphasised the importance of publishing the results of analyses in the literature. It drew attention to the theme section of *Endangered Species Research* that includes the results of the 2010 Sakhalin Energy monitoring and mitigation programme<sup>8</sup> and the published papers concerning the ENL seismic survey in 2001 published in a special section of Environmental Monitoring and Assessment in 2007. Both sets of papers were helpful during development of the 2015 MMP.

### 2.5 Panel conclusions and discussion regarding Sakhalin Energy 2015 MMP

The Panel concurred with the conclusions of NTF-9 regarding the conduct of the 2015 seismic survey by the Company (see Item 2.2). With respect to mitigation, it agreed that this component as included in the final Company MMP was, despite some initial technical difficulties, ‘implemented satisfactorily’ (e.g. the shutdown procedures were followed efficiently and effectively, A-lines were completed quickly and the Panel’s Advisory Group had worked well). However, there were also lessons to be learned, as indicated below. Recognising the unexpected difficulties in 2015 caused by the late change in start date for the Sakhalin Energy survey caused by the ENL surveys, the Panel also notes the need for the planning process to take into account factors such as tide conditions (with implications for feathering; see Item 2.1) in order to avoid night-time shooting.

With respect to monitoring, the Panel also acknowledged the great efforts of field personnel to implement this component in difficult conditions. However, as discussed at the NTF-9 meeting and summarised under Item 2.2, not all aspects of monitoring were undertaken in full accord with the MMP. In particular, with regard to behaviour and distribution, much of the time during the pre-seismic week (extremely important for detecting whether any change occurred as a result of the survey) was spent training, obtaining information on and clarifying protocols, and solving equipment problems. In addition to severely limiting the amount of pre-seismic survey data obtained, this learning period and the inevitable improvement in performance of observers over time may create analytical difficulties in being able to assume that the data have been collected in a consistent manner (and see Item 2.4).

The Panel concluded that there were a number of important practical lessons to be learned from the 2015 experience. These relate primarily to the use of new technology under poor visibility conditions, problems with acoustic equipment, and the number of and scheduling for on-board MMOs.

In summary, the Panel agreed with the NTF’s conclusion that Company field personnel had made every effort to implement the MMP. Given the complexity of the operations and the remoteness of the area, it recognised that there will always be a need for some *in situ* fixes. That being said, it stressed that it was essential for the Company to learn lessons in order to minimise problems in the future, especially in terms of field planning, recruitment, testing and training.

Whilst recognising some practical difficulties, the Panel was disappointed that a number of the problems encountered had been anticipated by previous recommendations that were made well before the survey took place (e.g. recruitment of behavioural team leaders, MMOs and their training, albeit those recommendations had not been originally made in the context of simultaneous surveys). Following those recommendations in a more timely manner would have prevented or moderated at least some of the problems that were encountered during the survey. Therefore the Panel **recommends** that the Company improves field planning, recruitment, equipment testing and training and that it works more closely, and much farther in advance of future seismic surveys, with the Panel and NTF towards that end.

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<sup>8</sup> <http://www.int-res.com/journals/esr/esr-specials/seismic-survey-and-western-gray-whales/>



In particular, the Panel **recommends** that for any future seismic survey, the Company ensures that:

- (1) if new acoustic equipment is to be used, (a) full field testing of complete systems occurs well before the survey begins, (b) sufficient backup equipment is available in the field and (c) experienced acoustic engineers are available to conduct or oversee installation following well-tested protocols;
- (2) if additional technology (e.g. night-vision or passive acoustic monitoring equipment) is to be used so that operations can continue in poor visibility (including at night), the effectiveness of that technology must be objectively and quantitatively evaluated, in field conditions comparable to those in which it will be used, prior to its inclusion as part of an MMP;
- (3) experienced team leaders are appointed well in advance and ideally they are deployed in the field the year before to gain familiarity with (a) protocols, (b) software/hardware, (c) classification of behaviour and (d) local conditions. It was also suggested that it may be valuable to hold refresher courses at either Yuzhno or in the field camp before the pre-seismic monitoring effort begins.

The Panel also highlighted and **welcomed** several positive lessons from the 2015 survey including: the ability to use data from partial lines rather than having to reshoot whole lines, the importance of the IO, and the value of the approach of using a small Panel Advisory Group to give quick-turnaround feedback immediately before and during the survey.

Regarding any modifications to future MMPs, the Panel agreed that it was premature to consider major changes until data analyses from 2015 were completed. Any proposed changes will require review in the light of (1) benefits or loss of benefits to the whales, (2) new data and analyses including analyses of potential cumulative effects and incorporation of data from all years, (3) details concerning the nature of specific surveys, (4) evaluations of new technology and (5) the relative costs of different approaches.

In concluding this section of the agenda, the Panel drew attention to the fact that 2015 represented the largest level of seismic survey activity ever on the Sakhalin shelf and the largest monitoring effort. The Panel acknowledged that Sakhalin Energy was not the largest contributor to this activity nor was its survey the closest to the near-shore feeding area of the gray whales (as had been discussed, for example, at GWAP-15 and referred to under Item 3.2.3). To obtain maximum benefit from the experience gained and data collected, joint analyses with ENL are essential.

This is discussed further under Item 3.

### **3 CONSIDERATION OF STRATEGIES WHEN SIMULTANEOUS OR SAME-SEASON SURVEYS BY MORE THAN ONE COMPANY ARE PROPOSED**

A major complication for the planning of the 2015 Sakhalin Energy seismic survey was the late (October 2014) realisation that ENL would be undertaking major seismic surveys in the same season, including coverage of Rosneft's North Chayvo licence area. This led to the unfortunate need for the Panel to undertake additional calculations in the absence of reliable information from ENL so that it could advise Sakhalin Energy on the most appropriate strategy. This culminated in the Panel's statement of concern regarding proposed seismic activity on the Sakhalin shelf in 2015<sup>9</sup>. It also led to many of the changes made by Sakhalin Energy to its MMP for 2015 from that originally recommended by the NTF and the Panel (see Item 2.2). The Panel recognised that conflicts of this sort may arise again in the future and therefore it is important to begin addressing the issue as soon as practical. The slide presentation by an ENL representative (see Item 3.1 below) represented a useful first step.

#### **3.1 Presentation on preliminary results of ENL mitigation and monitoring plan (MMP)**

Kalinin of ENL provided a preliminary summary of the gray whale MMP implemented by ENL for the seismic surveys carried out in the 2015 open-water season in the Odoptu license area (approx. 11 June to 7 July; all A-lines finished by 1 July), West Chayvo license area (approx. 11 June to 28 July) and Arkutun-Dagi license area (approx. 7 July to 24 September). Three seismic vessels were used for these surveys, which

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<sup>9</sup> [http://cmsdata.iucn.org/downloads/finalcleanwgwapstatement\\_08\\_may\\_final.pdf](http://cmsdata.iucn.org/downloads/finalcleanwgwapstatement_08_may_final.pdf)

covered a total of approximately 1900 km<sup>2</sup> – two 12-streamer vessels and, for shallow-water work, one 4-streamer vessel. All three vessels were equipped with solid 4 km streamers and dual 2400 in<sup>3</sup> airguns in ‘flip-flop’ mode. Distance between lines for the 12-streamer grids was 200 m, for the 4-streamer grids 100 m.

A primary mitigation measure was to start and complete the portions of the surveys closest to the gray whale feeding area(s) as early in the season as possible once ice conditions allowed. MMOs aboard each seismic vessel were expected to monitor a safety zone around the seismic source arrays to protect gray whales from auditory injury. In addition, monitoring and mitigation of potential behavioural effects on gray whales was carried out through a combination of (i) acoustic modelling to characterize the acoustic footprint of the seismic source and thereby establish the behaviour ‘buffer zone’ boundary (5.5 km was the estimated maximum radius of the 163 dB SPL footprint), (ii) real-time acoustic detection from buoys deployed along the 20 m contour in the north and inshore of the Orlan platform (Arkutun-Dagi area) in the south and (iii) visual observation of whales from 13 shore stations (5 monitored for behaviour, 13 for distribution). Two vehicle-based photo-ID teams were deployed on shore.

A total of 115 people were engaged in the gray whale monitoring and mitigation program in the field. The programme spanned a total of 123 days from 1 June to 30 October. Visibility conditions were considered poor during 22% of the time. A total of 3,123 sightings of marine mammals (19 species) were logged by the MMOs on the seismic and support vessels, of which 457 were of gray whales.

Five shutdowns were triggered by MMO observations of whales inside the 500 m safety zone (two in Odoptu during June, one in Chayvo and one in East Arkutun-Dagi during July, one in Chayvo during August). Four shutdowns were triggered by real-time observations of gray whales in or about to enter the buffer zone after 30 June (all in Chayvo during the first half of July).

## 3.2 Panel discussion and conclusions

### 3.2.1 Regarding the 2015 ENL operations

The Panel thanked Kalinin for the presentation. In response to questions, he noted that the seismic survey work had continued at night and when visibility conditions were poor but he was not prepared to provide details on the mitigation procedures and protocols, which he said could be found in the MMP submitted to the Russian authorities. He confirmed, however, that night vision or remote sensing equipment was not used.

Any consideration of the 2015 activities would benefit from review of the ENL MMP. In response to a direct request for access, the Panel was told by ENL representatives that the programme had been submitted to the IWG in April 2015 as well as to the Russian regulators and that IUCN or the Panel was free to ask those bodies for the relevant documentation. The Panel **recommends** that IUCN approach the relevant bodies for a copy of the MMP.

The Panel noted that the ENL surveys used a 500 m radius around the seismic sound source as the exclusion (or safety) zone, as opposed to the 2 km exclusion zone applied in the Sakhalin Energy survey as specified by Russian Federation regulators (see Item 2.1). The ENL representative at the meeting indicated that the 500 m safety radius used by ENL was based on recent and evolving noise exposure criteria that estimate the onset of physical injury (permanent hearing loss or PTS) using extrapolations of measured temporary hearing loss in several cetacean species and estimates of frequency-specific hearing differences (‘filters’) in different species. ENL used the received sound levels estimated to result in PTS based on the onset levels and frequency-weighting filters that are extrapolated from a few odontocete cetaceans that have been tested to those that have not, including baleen whales, as described in Finneran and Jenkins (2012). These estimates result in very small physical ranges (on the order of a tens to a few hundreds of meters) for different species, based on the results of the modelling conducted by ENL and a conservative interpretation of these estimates of 500 m was applied to ensure consistency in operating procedures. The Panel’s views on these different interpretations are provided under Item 3.2.2.

From the information provided, the Panel was given to understand that for the ENL surveys, no practical distinction was made in the mitigation protocols between M-C pairs and other whales.

The Panel was unable to reach any useful conclusions regarding the 2015 ENL surveys based on the information provided. However, it noted that, according to Kalinin, a very large volume of distribution, behaviour and acoustic data had been collected and expressed a strong interest in learning more about ENL’s



plans for analyzing those data. As noted under Item 2.3, 2015 represented the largest level of seismic activity ever on the shelf and the largest monitoring effort; to obtain maximum benefit of this, joint analyses with ENL are essential. The Panel recognised the inherent difficulties obtaining agreement for this but emphasised that such analyses should benefit all and lead to improved mitigation. It **urges** that an expert group from both companies is formed that should meet to discuss the nature and objectives of such analyses and develop mechanisms and safeguards for data holders to facilitate them. The Panel would be pleased to participate in such discussions.

### *3.2.2 Safety zones and general considerations for source shut-downs to mitigate exposure to intense noise*

The Panel recognizes (and a number of its members are centrally involved in) efforts to apply available scientific information to establish effective mitigation of the effects of intense noise sources on marine mammals. Numerous scientific and conservation-related considerations are involved in setting precautionary mitigation rules for shutting down intense noise sources to protect marine mammals. These typically include quantitative predictions of different levels of various direct effects on hearing systems.

It is generally assumed that the auditory (hearing) systems of marine mammals are the most sensitive in terms of direct harm from intense noise. While there may be non-auditory effects of noise exposure, in practical scenarios that involve shut-down of intense noise sources, rules typically relate primarily to auditory effects. Acoustic thresholds (often called noise exposure criteria) established for physical injury to hearing systems may depend on the regulatory status of the animals that could be exposed (whether they are endangered, small in number, etc.) and the associated definition of what constitutes injury. Such thresholds are usually based on estimates of either temporary threshold shifts (TTS) or permanent threshold shifts (PTS) in hearing. Various scientific, regulatory and logistical considerations are also taken into account.

Although estimates are available for the levels of noise sufficient to induce TTS in most marine mammal species and estimates of PTS onset levels have been made using some direct measurements with fairly extensive extrapolation for cetaceans and pinnipeds (Southall *et al.* 2007; Finneran and Jenkins 2012), significant scientific uncertainty is present when estimating received sound levels upon which to base shut-down ranges. This uncertainty is particularly great for the large whales because we do not even have direct measurements of their hearing characteristics, much less empirical measurements of the noise exposure levels sufficient to affect their hearing, whether temporarily or permanently. In addition to accounting for uncertainty, the status of the species or population in question (e.g. endangered, abundant) is often a relevant consideration as a regulatory policy when establishing ‘safety’ shut-down zones. This may be true regardless of whether there is evidence suggesting greater potential harm from a given exposure level to an endangered species or population than to a non-endangered species or population. Rather, it reflects the fact that policies providing stronger protection are applied to rarer, more at-risk species and populations given the uncertainties and the degree of harm that could result from underestimating effects. Finally, from a practical standpoint, the nature of the operation must be taken into account. In most cases involving high-intensity, moving noise sources, no single point defines the source, but rather the entire vessel and source dimensions need to be considered together. Additionally, it is necessary to consider the time required from the moment of detection of an animal to the moment when the source is shut down. These considerations become particularly important in practice where estimates of PTS onset are small enough to be on the order of the size of the survey vessel itself.

There is as yet no unequivocal, quantitative way of integrating scientific knowledge (and uncertainty) with operational considerations, to derive standard distance offsets based on TTS or PTS onset levels that will ensure a sufficiently large safety zone in all conditions. There is a need to apply relevant scientific information to inform and better support mitigation measures; a balance must be found with respect to uncertainty so as not to maintain unnecessarily large exclusion zones that result in very frequent shut-downs which significantly extend the overall period of disturbance resulting from the survey. However, given these factors and the practical considerations described above, particularly where estimates of PTS onset suggest very small exclusion zones (e.g. <500m), the Panel identifies the need for substantially larger zones than would be derived solely from a linear application of received levels estimated to result in hearing damage. The extent of the distance offset required clearly depends on the scenario and the regulatory process involved. In cases where a highly endangered species or population is at potential risk and there is a high degree of uncertainty, each of which applies to the gray whales at Sakhalin, substantially larger shut-down

zones may be appropriate than zones derived strictly from predicted direct injury at the highest estimated level (PTS).

### 3.2.3 *Dealing with cumulative issues including multiple surveys.*

The Panel **recognises** the progress that was made, under extreme time pressure, to evaluate cumulative exposure in a quantitative way in order to provide final advice to Sakhalin Energy on mitigation strategies in 2015 (e.g. see Cooke, 2015)<sup>10</sup>. It notes that in 2015 the ENL surveys (judging by the limited information available) were of greater concern for gray whales than the Sakhalin Energy survey given their geographic extent and duration. This type of consideration should be taken into account when companies are developing their individual MMPs. The Panel strongly **encourages** co-operation between and among companies when planning future surveys, with as much advance time as possible for responsible planning of overlapping operations.

The Panel also draws attention to its earlier (largely qualitative) discussions regarding the merits (from the whales' perspective) or otherwise of (a) having 'quiet' years and then periodically 'noisy' years when multiple seismic surveys are being conducted, rather than spreading out the surveys individually over several years; and (b) the need to avoid 'boxing in' the whales such that they are unable to find 'quiet' areas nearby when anthropogenic noise levels become too intense.

It is important for the Panel (and the companies) to continue trying to quantify such discussions, e.g. using the Cooke approach referred to above and recent modelling efforts to examine population consequences of disturbance (see Item 9.5 below). The Panel once again **emphasises** the importance of improved collaboration amongst companies, specifically when it comes to (a) sharing plans for future seismic surveys in a timely fashion; (b) sharing data to improve understanding of effects of noise on whales; and (c) developing common approaches to MMPs, taking cumulative exposure into account. It **recommends** that the issue of how to manage multiple seismic surveys in and near the Sakhalin gray whale feeding areas be given priority on the NTF's agenda. In this regard, the Panel welcomed Sakhalin Energy's assurance that it supports the concept of improved co-operation with ENL and other operators on such matters and that it intends to continue engaging in these kinds of discussions.

## **4 UPDATE ON SAKHALIN ENERGY'S OCEAN BOTTOM NODE (OBN) SURVEY PLANS FOR 2017/2018**

### **4.1 Presentation by the Company**

Blonk had provided a detailed report to the NTF-9 meeting. What follows here is a summary of the major points that he presented there. The Company's starting point was the result of the 2010 Astokh 4D-seismic survey and the implications for continued 4D monitoring in view of the need for prudent reservoir management. In this context the Company is reviewing options related to the use of streamer and/or Ocean Bottom Node (OBN) technology for the next 4D seismic survey over Piltun-Astokh which is planned for 2018. Survey objectives will be similar to previous 4D surveys, namely: (1) acquiring quality 4D seismic data within budget and time allowance, without incidents; (b) using new acquisition or processing technologies that allow imaging beneath the platforms and through gas clouds; (c) protecting marine mammals; and (d) being transparent to the external world about the acquisition activities.

Blonk noted that although 4D streamer acquisition has been shown to be effective, a transition to OBN is preferred from both technical and environmental perspectives. The main reasons are that OBN offers:

- (1) the ability to acquire data near and under the platforms and to improve 3D and 4D imaging (e.g. potentially 'seeing through' gas clouds) and

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<sup>10</sup> Technical Supplement to GWAP Statement of 8 May 2015: Updated predictions of cumulative sound exposure for Sakhalin gray whales from the proposed 4D seismic survey in 2015, with comparative predictions for other surveys. [http://cmsdata.iucn.org/downloads/cooke\\_final\\_16\\_may\\_2015\\_1.pdf](http://cmsdata.iucn.org/downloads/cooke_final_16_may_2015_1.pdf).

- (2) opportunities to reduce the environmental footprint, potentially through reduced source strength, limiting the survey area, and improved vessel manoeuvrability, with the latter points expected to lead to a shorter time in the field.

However, the transition to OBN carries complications with it, key ones being:

- (1) the risk of not being able to properly match OBN data to 2015 streamer data;
- (2) potential complications with getting access to a capable OBN operator in the region;
- (3) the first OBN survey likely taking longer than a corresponding streamer survey.

The Company is therefore beginning to evaluate several acquisition options varying from a full-field OBN survey (1997 size), a smaller-scale targeted OBN survey, a streamer-OBN hybrid survey, to falling back on a streamer acquisition survey again. A hybrid option would allow moving more gradually into replacing streamer acquisition with OBN while protecting 4D-repeatability with past surveys, but at a cost of being operationally more complex and expensive. This evaluation will *inter alia* take into account lessons learned from the 2015 survey and the associated MMP.

At this stage, the most viable acquisition option cannot yet be identified, although a full-field (1997 size) survey does not seem feasible, and a 2015-like streamer repeat would not be preferred. The Company will continue to work with key stakeholders such as the NTF and GWAP to evaluate ways to limit the environmental impact of future seismic surveys. Furthermore, the NTF will be engaged when more specifics are known about key parameters, e.g. possible source strength reduction for an OBN acquisition.

Regarding the frequency of monitoring, Blonk noted that he could not rule out the need for a survey before it was currently planned due to unforeseen circumstances, but noted that the Company would be very challenged if it had to go into the field to conduct a large-scale seismic survey more often than every 3-5 yrs.

#### **4.2 Panel discussion and conclusions**

The Panel reiterated the view of the NTF welcoming the information that the Company was seriously considering options for replacing streamer surveys and that it was engaging the Panel at an early stage in the process. It also welcomed the Company's desire for the Panel to participate in the process. It recognised that considerably more evaluation and planning was needed and that any consideration of future options must follow the same rigorous process as previous streamer surveys, e.g. with respect to modelling noise footprints and looking at other possible sources of disturbance including deployment of the OBNs.

A number of key issues need to be considered, initially via the NTF, including:

- (1) examination of information available from OBN surveys elsewhere to determine how much investigation could be 'desk top' and whether there would be a need for experiments at Sakhalin itself;
- (2) consideration of new developments in other approaches that might be effective in shallow waters including marine vibroseis;
- (3) consideration of future interactions with other companies' activities;
- (4) examination of all components of OBN deployment as well as operation in the context of potential disturbance to gray whales and their habitat (e.g. bottom disturbance and alteration from node deployment, whale entanglement in cables).

The Panel recognised that its contributions center on the potential impacts on whales and not the relative merits of different technologies in relation to the Company's business objectives. It welcomed the early provision of information by the Company and agreed that it would share with the Company any relevant papers or reports on new technology developments. In terms of developing an MMP for 2018, the Panel referred to the discussions under Items 2 and 3, stressing that it is essential to begin planning as soon as possible, within both the Panel and especially within the NTF, and to allow sufficient time to avoid problems similar to those encountered during the lead-up to the 2015 survey.

## 5 SAKHALIN ENERGY PROGRESS AND ACTIVITIES REGARDING SHIP STRIKE RISK MITIGATION AND OIL SPILL RESPONSE

### 5.1 MMOs and ship strikes

The 2014 close-out report (confidential document GWAP-16/12) indicated that the 17 Sakhalin Energy shipboard MMOs made 719 marine mammal sightings between June and November 2014. Of that number, 209 sightings were of gray whales. On one occasion (19 October) two whales were seen milling within less than 1 km of a research vessel (*Pavel Gordienko*), triggering mitigation action. All activities were stopped and the vessel drifted until the animals were at what was considered a safe distance, i.e. a minimum of 1000 m in accordance with the Company's current (2009) Marine Mammal Protection Plan. No other encounters with gray whales required mitigation and there were no 'close calls' in terms of ship strike risk. Compliance with the Sakhalin Energy's vessel traffic corridors and speed limits was reportedly good.

A right whale (*Eubalaena japonica*) was observed on 2 October at 47°59'N, 144° 46'E and there were five sightings of fin whales (*Balaenoptera physalus*), most of them also in October. The Panel noted that there is particular interest in learning more about the occurrence of right whales throughout the North Pacific. Therefore the Company is **encouraged** to include photographic documentation, especially of rare species such as right whales, as part of its MMO protocol, and to share photographs and other data on such sightings with researchers in other range states (for right whales including at least Russia, Japan, South Korea, Canada and the United States).

The Panel is interested in knowing whether other companies operating on the north-eastern Sakhalin Shelf have their own marine mammal protection programmes similar to Sakhalin Energy's, including vessel corridors and speed limits. It was suggested that MNR could provide such information and therefore the Panel **requests** that IUCN investigate this matter further with the appropriate Russian authorities.

Confidential document GWAP-16/13 presented a comparative analysis of the two routes for Sakhalin Energy support vessel traffic, the old route and the new route that had been used on an experimental basis over the past two years. The new route passes between the Piltun (near-shore) and Offshore feeding areas, and it is known from the IBM photo-ID results that there is considerable movement of whales (other than M-C pairs) between the two areas. Despite this, the Panel is reasonably satisfied, on the basis of the sighting results presented in GWAP-16/13, that the new route does not pose a greater ship-strike threat to gray whales than the old route. With regard to the proposal to increase the allowed speed for crew change vessels from the current 21 knots to the design speed of the catamarans (30-35 knots), the Panel is sympathetic to the reasons given, but the information presented is not sufficient to allow it to draw a conclusion about potential impacts on whales. In order to estimate the specific ship strike risk from the crew change vessels, the following information would be needed:

- (1) A breakdown of vessel transit time by (a) day/night, (b) good/poor visibility and (c) calm/rough seas;
- (2) Angle and radial distance to each gray whale sighting (which together give perpendicular distance);
- (3) Width of vessel surface footprint (at planing and non-planing speeds, if noticeably different);
- (4) An assessment of how much other high-speed traffic is expected in the area.

Reasonable break points for the first item could be (a) nautical twilight, (b) 1km visibility and (c) sea state 4. The reason for the last item is that risk assessment for high-speed transits must be based on the assumption that such speeds would be generally permitted. The Panel **recommends** that such information and analyses be presented for its consideration at the next GWAP meeting.

### 5.2 Oil spill response planning and drills (incl. rec. GWAP-14/011 A/B if not completed in 2015 as recommended, and 14/012)

The Company indicated that three Tier 1 desktop exercises would be carried out in quarters 1, 3 and 4 of 2016. In addition there will be monthly Tier 1 exercises at each asset. Furthermore a complex Tier 3 exercise is planned for the Piltun-Astokh field in the second quarter.

The Panel **commends** Sakhalin Energy for its oil spill contingency plans. These are ambitious and meet high standards. With its frequent theoretical and practical exercises, the Company has developed the conditions

for a rapid and effective response should an incident occur. By carefully evaluating the outcome of every exercise, the preparedness level should be high and the personnel well acquainted with the procedures for an effective and targeted response.

The Panel looks forward to assessing the capacity of the new oil spill response vessels that are planned to be delivered in 2017. In the meantime, the Panel continues to be interested in exploring with IUCN and Sakhalin Energy opportunities for a Panel delegate to observe exercises directly, for example in connection with the planned complex Tier 3 exercise in the 2<sup>nd</sup> quarter of 2016.

### **5.3 Other Sakhalin Energy activities 2015-2019**

Lock provided a summary of Sakhalin Energy's planned activities over the period 2015-2019 (confidential document GWAP-16/16). Those new, non-routine activities that are of potential relevance in the GWAP context (besides the planned OBN seismic survey discussed under Item 4) are given below.

- (1) The Company is planning a major rig and accommodation upgrade for the Molikpaq (PA-A platform) and this will take place in 2018 at the earliest. The operation may require heavy-lift vessels, with associated noise implications;
- (2) A temporary beach landing facility for heavy equipment will be required near the Onshore Processing Facility at the LUN-A platform, approximately 60 km south of the Piltun feeding area (year uncertain);
- (3) Geotechnical assessment for relief well compliance will require a high-resolution seismic survey for shallow gas hazards (160-180 cubic inch airgun array used in a limited area) although no such survey is currently planned.

In general, it is understood that no major noisy activities likely to increase the exposure of gray whales to underwater sound are anticipated for the Sakhalin II project in the foreseeable future (other than the OBN seismic survey in 2018).

## **6 RESULTS OF 2014 SAKHALIN ENERGY/ENL JOINT PROGRAMME ON GRAY WHALE MONITORING AND RESEARCH AND PRELIMINARY FIELD RESULTS FROM 2015**

### **6.1 Acoustics (including recommendation GWAP-13/006)**

#### *6.1.1 General results of 2014 monitoring*

During the 2014 season, the acoustics team from the Pacific Oceanological Institute (POI), Far East Branch of the Russian Academy of Sciences (FEB RAS), collected underwater acoustic and hydrological data offshore of north-eastern Sakhalin Island. This type of work has been conducted as part of the Sakhalin Energy/ENL Joint Programme since 2003, with the overall objectives of monitoring background (natural) and anthropogenic sound levels, assessing their seasonal and inter-annual variability, identifying industrial activities causing elevated noise levels, and enabling the estimation of anthropogenic sound levels in the gray whale feeding areas.

As part of this ongoing study, 14 Autonomous Underwater Acoustic Recorders (AUARs) were deployed during August and September at standard acoustic monitoring locations to perform continuous acoustic measurements. A prototype new-generation AUAR was also deployed over the same period near an original AUAR for a commissioning trial. The new type of instrument is significantly smaller and easier to handle than the original, uses less than one-tenth the power, has double the dynamic range enabling it to measure acoustic signals of widely different levels, and records data to solid-state memory cards instead of a conventional disk drive.

A specific objective of the 2014 acoustic monitoring was to measure the difference in anthropogenic sound levels between the traditional locations of two AUAR stations (Orlan and Arkutun-Dagi) and new sites located within 3 km of the ENL platforms Orlan and Berkut respectively. The intent was to enable relocation of the buoys for measuring acoustic levels at the edges of the Offshore feeding area from their original stations to new sites inside the controlled navigation zone around the platforms as a means of protecting the

equipment from damage by fishing vessels and gear. In prior years the Orlan and Arkutun-Dagi stations (and consequently their data) were repeatedly lost to bottom trawling activities. The successful characterization of the acoustic transfer functions that was achieved in 2014 will enable the estimation of anthropogenic noise levels in future seasons at the original locations based on data acquired by the nearer, better protected stations.

Of the 14 primary AUARs deployed in the 2014 season, 13 functioned without issues for the entire period. Regrettably the unit at the Control site, located far enough to the north of the monitored industrial activities to provide a relatively unaffected acoustic background reference, stopped working two days after deployment due to an electronics fault and thus returned essentially no data. This failure points to the obsolescence of the circuitry in the original AUARs and is a further motivation for the development and phasing-in of the new-generation units. This is the second time there has been a problem at a control site, again demonstrating the need for redundant deployments of acoustic recorders at such sites. The Panel **recommends** that Sakhalin Energy provide a brief document by the end of March 2016, for inter-session consideration by the Panel, outlining a strategy for addressing this issue, including proposed locations of control sites, clear indication of the types of units to be used at these sites, and a firm timeline for deployment. The Panel's expectation is that this matter will be resolved in time for the 2016 season.

Differential measurements between AUAR stations located strategically at various distances between and shoreward of the Sakhalin Energy platforms PA-A (Molikpaq) and PA-B allowed the selective characterization of noise from their operations in 2014 and comparison with characteristics recorded in other years. Spectral analysis confirmed the presence of sustained tonal anthropogenic sounds in the 50-300 Hz frequency range, which were shown statistically to be stable throughout the season. This is interpreted to indicate that the tones originated from the platforms themselves and not from vessels periodically tending them. Overall, the anthropogenic sound levels in 2014 measured at two annual monitoring points situated between the PA platforms were found to be statistically similar to those measured in 2012, and at one of the two stations they were significantly lower than in 2013. Measurements at AUAR stations aligned shoreward of the PA-B platform also showed that because of the attenuating effect of a shallow sea floor on the propagation of longer wavelengths, low-frequency anthropogenic noise levels at the 10m depth contour are weaker by about 10 dB compared to the corresponding levels at the 20m contour.

#### *6.1.2 Follow-up on recommendation GWAP-13/006*

A dedicated acoustic measurement trial was undertaken for the purpose of comparing the sound emissions from (i) a Zodiac with a 50 HP 4-stroke outboard motor and (ii) a fiberglass launch with a water-jet propulsion system, under a range of operating conditions. The aim of this trial was to provide information relevant to selecting small craft to use in scientific work near gray whales based on their relative quietness at the frequencies likely to cause disturbance. Analysis of the measurements showed that both vessels emitted strong tonal components, with clear differences in the spectra at both low and high frequencies due to the distinct resonance properties of their hulls. In broadband terms, the noise level from the launch was found to exceed the noise level from the Zodiac by an average of 4 dB. The Panel noted, however, that the acoustic differences between these two observation platforms were not great, and though the launch was louder overall, it was actually quieter at low frequencies. This issue and several others (e.g. the 'control' station failure and the ongoing noise from platforms) require additional attention from the Noise Task Force; the Panel **recommends** that additional time ( $\geq 0.5$  day) should be scheduled for the next NTF meeting to consider noise issues beyond the ongoing matters related to seismic surveys.

#### *6.1.3 Hydrology*

Along with the acoustic measurements, hydrological conditions were sampled in 2014, resulting in 142 samples of sound velocity, temperature, salinity and turbidity profiles in the water column during June, August and October. Analysis of the 2014 profiles confirmed the ongoing influence of high Amur River outflow rates that the previous year had caused record low salinity levels in the Offshore feeding area. By mid-October 2014, however, hydrological properties in the Offshore feeding area had returned to long-term annual average conditions.

## 6.2 Benthic and hydrology (including rec. 14/010)

### 6.2.1 Presentation

Samatov provided an overview of studies of the benthos in the feeding grounds of gray whales in 2013-2014 based on document GWAP-16/6. The main objective continues to be to monitor the distribution, composition and biomass of important benthos in the two main gray whale feeding areas, Piltun and Offshore.

In 2013 sampling was conducted in June (Piltun only) and October (both Piltun and Offshore); this was the first year when benthic communities in the Piltun feeding area were sampled twice during the same year. In 2014 sampling was done in both September and October at both Piltun (including Chayvo) and Offshore. The biomass of benthos in both the Piltun and Offshore areas was not significantly different between 2013 and 2014. In terms of biomass, the amphipod *Monoporeia affinis* was the dominant species, followed by *Eogammarus schmidtii*, in the shallow waters (< 15m) of the Piltun feeding area. Both species were found in association with fine sand bottom sediment. No gray whale 'feeding points' (presumably meaning locations where feeding behaviour was observed) were sampled in 2013 or 2014.

Bottom sediments and zooplankton were also sampled, chemical analyses of sediment samples were conducted, and hydrological measurements were made. Fine sand dominated the Piltun feeding area at depths shallower than 15 m and also prevailed at > 95% of the stations in the Offshore feeding area. Samatov suggested that productivity of the Piltun feeding area is influenced by freshwater input from the Amur River and the upwelling events of cold waters on the shelf.

This programme to assess and monitor the benthos has been ongoing since 2002. However, the time series suffers from many inconsistencies (e.g. variable time and season of sampling, differences in sampling depths and locations, etc.). This makes the statistical analyses challenging. Also it was noted that no pollutant results were available for 2013-2014.

### 6.2.2 Panel discussion and conclusions

The Panel appreciated the presentation by Samatov but was disappointed that V.V. Ivin, the benthos expert who has replaced V. Fadeev as the lead scientist for this aspect of the Sakhalin Energy/ENL Joint Programme, was not able to attend the meeting. The Panel was pleased that the long-term monitoring programme continued in 2013 and 2014. However, the Panel **stressed** that the value of such monitoring would be increased if there were closer coordination (especially in terms of study design) between whale distribution and the collection/sampling of prey. It is important to enhance understanding of the biophysical processes responsible for the exceptional benthic productivity of the Piltun and Offshore feeding areas. The Panel also **emphasizes** that it is preferable for the benthic sampling to take place at the same time every year, and in both feeding areas, to ensure comparability between years and allow meaningful comparisons between the two areas.

Noting the lack of information on pollutants in 2013 and 2014, the Panel again **stresses** the importance of monitoring for heavy metals, pesticides and petroleum hydrocarbons in the abiotic (e.g. sediment) and biotic (e.g. prey and gray whale tissues) components of the two main feeding areas.

Pomerleau observed from her reading of document GWAP-14/8, that information was collected on biochemical tracers, including stable isotopes of carbon and nitrogen, and fatty acids, in gray whale tissues and in three of their main prey species. These results were from 2012 but according to Samatov, similar analyses were conducted in 2010 and 2011. The Panel **recommends** that all available biochemical data on whale tissues and whale prey be analysed and the results made available as soon as practical. It also **recommends** further isotopic analyses of gray whale skin samples and a broader sample of prey species in order to improve understanding of the feeding ecology of this whale population. Carbon isotopes, and to some extent sulfur isotopes, are typically used in studies of food web processes in estuarine and coastal systems (e.g. to tease apart terrestrial vs. marine inputs). Isotope data would help resolve questions concerning the potential contribution (subsidy) of Piltun Lagoon to benthic production in the whales' feeding areas and on the Sakhalin Shelf more generally.

### 6.3 Photo-ID

Tyrneva presented GWAP-16/8, which contains the results of photo-ID work on the Sakhalin shelf in the 2014 season (31 July<sup>11</sup> – 8 October) conducted by the Institute of Marine Biology (IBM), Vladivostok. Three teams conducted photo-ID: one vessel-based team, one shore-based boat team using inflatables operating from a temporary base near the Piltun lagoon mouth, and one road vehicle team photographing whales from the shore. The vessel-based team operated in both the Piltun feeding area and the Offshore feeding area. The vessel-based team made 194 gray whale sightings, the shore-based boat team made 320 gray whale sightings and the shore-based vehicle team made 252 gray whale sightings. The total photo-ID survey effort was 402 hours, more than in 2013.

Processing of the photographs revealed that the 766 sightings represented 137 distinct whales, of which 12 were identified as calves and 9 as mothers of calves, using the same criteria as in previous years. Sixty-three individual whales were sighted in the Piltun area only, 55 in the Offshore area only, and 19 in both areas. As in previous years, no calves were seen in the offshore area.

Apart from the calves, three further whales were new to the IBM Sakhalin catalogue. The size of the IBM catalogue following the 2014 season is 243 whales, plus 10 temporary whales whose identity is still pending. One of the new non-calves had previously been seen in Kamchatka, bringing the total number of Sakhalin/Kamchatka matches to 85<sup>12</sup>.

### 6.4 Biopsies and genetic studies

Samatov reported briefly on genetic studies. Nine biopsies were collected off Sakhalin in the 2014 season but analytical results are not yet available.

An analysis of mitochondrial DNA from 35 biopsies collected off Sakhalin during 2011-2013 was presented to the International Whaling Commission's (IWC) Scientific Committee (document SC/66a/SD4<sup>13</sup>). The analysis found an apparent statistically significant difference in haplotype frequencies between years. However, the Panel urges caution in interpreting this finding, particularly the nominal significance level, because the presence of M-C pairs in the area makes the effective sample size smaller than the nominal one. Each M-C pair in the sample (whether or not the animals were actually sampled together as a pair) should be counted as one animal when calculating significance. In addition to the two observed M-C pairs, there may be one or more cryptic M-C pairs within the sample, because there were four further known reproductive females and four unaccompanied calves in the sample.

In principle, the sex determinations from biopsies collected under the Sakhalin Energy/ENL Joint Programme could be used for population assessment, supplementing those collected under the Russia-US programme. However, collection and processing of the data needs to proceed with care to avoid biopsies being assigned to the wrong whales. The 35 biopsies collected during 2011-2013 included five duplicate pairs (whales biopsied twice) as determined by photo-ID. However, two of these five photographically determined duplicate pairs were not genetic matches (document IWC/SC/66a/SD4). Although the sample size is small, 2/5 is a worryingly high error rate. If laboratory and data processing errors can be ruled out, this would leave the possibility of field error (e.g. the photographed whale was not always the biopsied whale). The Panel **reiterates** its recommendation GWAP-12/025 that, if biopsies are to continue to be collected as part of the Sakhalin Energy/ENL Joint Programme, measures are taken to ensure reliable linkages between the biopsy sampling and the photo-ID catalogue. In cases where, despite those measures, a biopsy cannot be associated with an identified whale with certainty, this uncertainty should be reflected in the recorded data.

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<sup>11</sup> Dates incorrectly given as 31 June – 8 October in the English version of document GWAP-16/8.

<sup>12</sup> Document GWAP-14/12 indicates that there were 85 matches (plus 1 temporary) between Sakhalin and Kamchatka up to 2013, the same number as given in document GWAP-16/8, despite the new match reported in 2014.

<sup>13</sup> Available at [iwc.int/sc66adocs](http://iwc.int/sc66adocs)



## 6.5 Distribution

### 6.5.1 Presentation

V. Vladimirov presented a summary of document GWAP-16/7 describing the distribution of gray whales off north-eastern Sakhalin based on observations made in August-September 2014. Distribution surveys were conducted by both offshore and onshore teams following the same transect lines and survey protocols as in 2013. In 2014, bad weather frequently interfered with vessel-based data collection offshore but the weather was relatively good for the shore-based component.

Shore-based observations were made in the Piltun feeding area from 1 August through 30 September. The average number of whales sighted on complete, synchronized surveys was around 35 and the maximum number was 48. The majority of whales (65% of sightings) were seen in waters adjacent to the mouth of Piltun Lagoon. Another 25% of sightings were made in the northern part of the area after mid-September. Most of the whales (89%) were seen inside the 10m isobath, and 53% were inside the 5m isobath.

While the distribution of whales in 2014 was similar to what had been observed in previous years (1984-2013), the authors of GWAP-16/7 noted several peculiarities, including: (1) a low maximum number of whales (n=48) counted during synchronous shore surveys, and (2) the lack of significant numbers of whales (i.e. 'northern groupings') in the northern portion of the nearshore survey area during September. Both of these findings resemble patterns and trends observed in 2008, when the total maximum number of whales counted during synchronous shore surveys was 47 and low numbers of whales were observed in the northern portion of the feeding area. In light of the results reported in GWAP-16/17 which found a correlation between the 2008 feeding season and a time-lagged impact on reproductive success, the 2014 benthic studies and potential sources of anthropogenic disturbance (e.g. seismic surveys) be investigated further in that context.

In the Offshore feeding area, two complete surveys were conducted on 1 and 15 September. Sightings were made mostly in the south-eastern portion, about 15 km further south than in 2013, in waters 50–65 m deep.

Results from synchronized onshore and offshore surveys on 15 September 2014 indicated the total abundance of gray whales off the north-eastern coast of Sakhalin Island was 75 individuals. Forty-four were sighted in the Piltun feeding area and 31 in the Offshore feeding area. Over the course of the season, there were 48 sightings of cow-calf pairs, all in the Piltun feeding area. The maximum single-day count of cow-calf pairs was five, compared to two pairs sighted in 2013. Most cow-calf pairs were sighted near the mouth of Piltun Lagoon. This distribution of cow-calf pairs was consistent with observations in previous years.

V. Vladimirov noted that until 2006 abundance estimates from surveys and photo-identification were similar but that in more recent years photo-identification methods have produced higher estimates. He speculated that this change indicates that the whales are moving away from the north-eastern Sakhalin feeding area to other, undetermined feeding locations. This explanation, however, has no empirical basis and in some respects is counter to the intra-season satellite tracks obtained in 2010-2011.

### 6.5.2 Panel discussion and conclusions

The Panel **welcomed** the information provided by the Company and **reiterated** the importance of collecting data that are consistent and comparable. The Panel notes, however, that all four objectives listed in GWAP-16/7 are solely about collecting data. There will be a need and desire to see all of these data analysed after the 2016 field season. The 16-year dataset would allow a number of important questions to be addressed, for example a detailed spatial analysis could be used to describe gray whale core use areas and how (and if) they change within and between seasons and years. The Panel **recommends** that the Company prepare for this effort, recognizing that it will require considerable time, funding and expertise. Finally, future studies should be more closely coordinated (especially in design) between whale distribution and feeding area ecology.

## 6.6 Results of integrated analysis

### 6.6.1 Presentation

Samatov presented document GWAP-16/10 which contains the results of an integrated analysis of whale distribution, benthic prey and ambient noise levels, from data collected during 2002-2013. The analysis was

## REPORT OF THE 16<sup>TH</sup> MEETING OF THE GWAP (GWAP-16)

carried out by Prof. E .A. Kriksunov and his team at Lomonosov Moscow State University. Ambient noise levels were defined in terms of the proportions of days within a month in which the daily average dB levels at a given location fell into one of three noise level bands: < 105 dB, 105-115 dB or > 115 dB SPL rms. Non-parametric analysis methods were used because the tools were not available to fit parametric models to data sets with different levels of temporal and spatial resolution. In summary, whale distribution was found to be correlated with benthic prey densities but not with ambient noise levels.

### *6.6.2 Panel conclusions and recommendations*

The Panel noted that from the results presented, the assignment of months and areas to noise bands appears to have been driven mainly by background processes such as wave action, and the anthropogenic noise by regular sources such as Molikpaq platform operations.

Because dB is a log scale, the average dB level represents a geometric mean which strongly downweights high sound levels, such that the geometric mean tends to be determined mainly by ongoing processes with medium noise output, and is little affected by short-duration high sound levels. Hence, metrics of cumulative sound exposure are usually based on cumulative energy rather than averaged dB levels.

What is known about whale responses to sound is that short-duration high-intensity sounds are more likely to drive a behavioural response than background levels from natural processes or ongoing activities. The Panel and the Company have sought to mitigate these levels, hence the mitigation strategy aimed to keep noise levels below 163 dB rms in the Piltun (near-shore) gray whale feeding area. Such levels are typically exceeded only during pulses rather than continuously in a day.

The apparent lack of correlation between whale distribution and the noise metric used is, in the Panel's view, not unexpected, but the analysis does not answer the question of whether whales are actually disturbed (i.e. caused to leave an area) by specific kinds and levels of acoustic exposure.

As discussed at previous meetings, the Panel reiterates that the best way forward would be a practical ('hands-on') workshop with access to data and where different methods of analysis could be compared. The Panel regrets that discussions on this, which have had to be conducted outside the GWAP framework, have not yet borne fruit. The Panel co-chairs agreed to take this up in discussions over the future work of GWAP.

## **7 REVIEW OF 2014 FIELDWORK RESULTS, PRELIMINARY 2015 RESULTS, AND 2016 SCOPE OF WORK**

### **7.1 Oil spill response planning and drills (incl. rec GWAP-14/011 A and B)**

Sakhalin Energy reported on several joint Emergency Coordination Team activities that were executed during 2015. These included three Tier 1 desktop exercises for offshore assets held during the first, third and fourth quarters. Also a field deployment exercise, Tier 1, Oil Processing Facility, was held during the third quarter. In addition a complex Tier 2 exercise at Prigorodnoye was held during the second quarter. This Tier 2 exercise consisted of a number of operations involving 12 vessels under the command of the Environmental Response Management Teams from Yuzhno and the Emergency Rescue and Response Centres, marine activities, and remote shoreline and wildlife protection operations. During this activity, simulated spraying of oil dispersant was carried out from vessels. Instead of dispersant, only water was used.

The Company reported that these activities had been completed successfully and that the goals of the drills and exercises had been achieved. The reason given by the Company for not conducting an exercise regarding shore-based management and disposal of oily wastes in 2015, per Recommendation 14/011, was that the simulated oil spill did not reach the shoreline in the practised scenario.

### **7.2. Joint Programme preliminary 2015 results**

#### *7.2.1 Presentation*

Samatov provided a brief summary of the work undertaken by the Sakhalin Energy/ENL Joint Programme in 2015 (based in part on the Scope of Work provided at the April 2015 GWAP working meeting).

## REPORT OF THE 16<sup>TH</sup> MEETING OF THE GWAP (GWAP-16)

The usual monitoring of gray whale distribution was conducted from the 13 shore sites between early July and early October. After 10 October, two teams remained in the field, one based on the North Piltun Spit and one on the South Spit. A total of 55 days of shore-based survey effort was achieved. Five offshore distribution surveys were conducted on Sakhalin Energy's crew change vessels. The transect grid covering the Offshore feeding area was modified based on analysis of 2014 data.

The vessel-based photo-ID team completed 48 missions, made 518 gray whale sightings and obtained 18,127 photographs. P. van der Wolf's vehicle-based team had completed 292 photo-ID missions and obtained 55,793 photographs from 959 individual sightings and was still in the field at the time of this meeting. The shore-based photo-ID team working from small boats completed 14 missions, made 164 sightings and obtained 4,949 photographs and nine biopsies.

The benthos was sampled at 89 regular stations: 38 at Piltun, 3 at Chayvo and 48 at the Offshore feeding area.

### 7.2.2 Panel discussion and conclusions

The Panel appreciated this briefing on Sakhalin Energy/ENL Joint Programme activities during the 2015 field season, which as indicated in the summary above had not quite ended at the time of this meeting.

A number of questions were raised concerning the prey investigations and whether the programme's design and methods were appropriate for addressing basic questions on the feeding ecology of gray whales in the Sakhalin region. Many of the analyses that have been conducted and that are planned depend on assumptions concerning the whales' energetics and prey preferences, which have yet to be verified empirically. Recently developed chemical tracers (e.g. stable isotopes and fatty acids) are increasingly used to describe food webs, examine trophic linkages and identify key prey items in marine mammal diets. As mentioned under Item 7.2.2, stable isotopes (SI) have been analysed in 20 skin biopsy samples and fatty acids (FA) have been analysed in 13 blubber samples obtained from Sakhalin gray whales (document GWAP-14/8). One of the main conclusions from that work was that further investigations of the isotopic composition of biopsies from a more representative sample of gray whales and prey items were needed (GWAP-14/8, page 49). The Panel agrees with that conclusion and therefore **recommends** that additional SI and/or FA analyses be conducted on samples from gray whales and a thorough array of known or potential prey species. The Panel believes that this avenue of investigation should be pursued in greater depth, beginning with the development of a detailed study plan that considers what can be accomplished using existing biopsies from the whales and samples from known and potential prey species, the proper methods for collection and preservation of samples, and what samples should be collected and analysed in the future.

In addition, while the benthic studies programme to date has provided a good description of the infauna captured by grab samples during the sampling periods (which have varied from June to October), there are limitations to the dataset. For example, the Van-Veen grab only works well in soft sediments and is not designed to sample mobile prey. Therefore the results measure only a subset of the potential gray whale prey and miss (or undersample) potentially important prey items such as shrimps and mysids. Also, through their feeding activity gray whales substantially modify the prey communities and the substrate they inhabit. Because of this, during the whale feeding season the feeding habitat will be a heterogeneous mosaic of patches where whales have not yet fed, where they have fed, and where the prey are recovering from having been fed upon, and the characteristics of the benthic communities will vary accordingly. In future analyses, it will be important to consider the variability caused by the whales' 'grazing' pressure on the benthos and the physical structure of the ocean bottom, as well as other oceanographic, biological and human factors that may affect the benthic community.

The Panel looks forward to engaging with Sakhalin Energy (if not both companies) in a systematic re-evaluation of the Sakhalin Energy/ENL Joint Programme in 2016, with a view to ensuring that the field data collection effort is question- or hypothesis-driven and is therefore more closely aligned with the kinds of multivariate analyses needed to inform management.

### **7.3 Scope of work for 2016 and plans for 2017**

#### *7.3.1 Presentation*

Samatov summarized current plans for the Sakhalin Energy/ENL Joint Programme in 2016 (internal document GWAP-16/11). The scope of work remains essentially unchanged from 2014 and 2015.

Shore- and vessel-based distribution surveys will be carried out by Sakhalin State University and led by V.A. Vladimirov. There will be 13 visual observation sites on shore. Sakhalin Energy's crew change vessel will be used for the on-water surveys and the Offshore feeding area will be surveyed every two weeks from mid-June to the end of November.

Sampling work to assess gray whale prey resources will be carried out by the IBM, FEB RAS, and led by V.V. Ivin. The R/V *Pavel Gordienko* will be used to sample the standard grid of stations (using a Van-Veen grab and bongo plankton net) in both the Piltun and Offshore feeding areas (the latter including the 'Extended Offshore Area') between 16 September and 20 November.

Shore- and vessel-based photo-ID (and biopsy) work will be carried out by the IBM, FEB RAS, and led by Y.M. Yakovlev (in the field) and O.Y. Tyurneva (in the lab) from 1 July to 5 October. The offshore component will depend on availability of one of Sakhalin Energy's supply/OSR vessels to approach the feeding area boundary and then deploy the photo-ID/biopsy team in either a Fast Rescue Cutter (FRC) or a Rigid Hull Inflatable Boat (RHIB). Stationary shore-based teams will operate from a temporary camp on the South spit from 1 August to 30 September, using two zodiac-type boats deployed daily when weather permits. A vehicle-based team will also be based at the South spit camp and range along the South Piltun Spit in August-September and the North Piltun Spit in October-November.

Acoustic and hydrological studies will be carried out by the POI and led by A.N. Rutenko. Sakhalin Energy's three supply vessels will be used, as available, to deploy, maintain and retrieve AUARs in or near the Piltun and Offshore feeding areas throughout the season.

The total period of the programme will be from 25 June, when the first on-water distribution survey is scheduled to begin, to 21 November, when the prey sampling effort is scheduled to end.

### **7.4 Overall Panel discussion and conclusions**

The Panel looks forward to engaging in discussions with the Company during 2016 regarding potential future changes to the Joint Programme. It **emphasized** the importance of ensuring that the programme is closely aligned with the research and monitoring questions that are of highest priority in terms of mitigation and risk reduction. The discussion above regarding the benthic sampling component (item 7.2.2) is illustrative.

### **7.5 Research activities and observations by other groups**

#### *7.5.1 Report of 2014 and 2015 seasons, Russia-US team*

A report of the 2014 season was provided to the IWC Scientific Committee (IWC document SC/66a/BRG16). Twenty photo-ID surveys were conducted from 8 July to 24 August. In a total of 42 observation hours, there were 203 encounters with gray whales involving a total of 79 distinct individuals. Nine M-C pairs were identified, four of which had separated by 14 August. Two new non-calf whales were identified and added to the catalogue, one of which matched a whale that had been photographed by Sakhalin Environment Watch off the central east coast of Sakhalin in 2013. The temporal overlap of the Russia-US and IBM photo-ID surveys in 2014 was only partial, with the Russia-US team working in July and August and the IBM teams in August and September.

Burdin reported that in 2015 the Russia-US team conducted surveys with an inflatable launched near Piltun Lighthouse from 2 July to 14 August. During 16 boat surveys with a total of 38 observation hours, there were 114 encounters with gray whales, involving a total of 60 distinct individuals. Eight M-C pairs and two new non-calf whales were identified. M-C pairs seem to have separated early in the 2015 season, which means that surveys later in the season would have had little chance to encounter M-C pairs.

No biopsies were collected in 2014 or 2015.

### 7.5.2 Other Sakhalin observations

Lisitsyn reported on gray whale observations near the Vostochny Reserve on the east coast of Sakhalin, around 220 km south of the Piltun feeding area. He had reported a single gray whale there in August 2013, which was subsequently identified from the IBM catalogue as a known male (KOGW215; Mityai). There were no gray whale sightings in the marine area adjacent to Vostochny Reserve in 2014. However, several sightings were made by Sakhalin Environment Watch volunteers from August through October 2015 and on 2 November Lisitsyn observed and photographed two separate groups of 2-3 gray whales within 1.5 km of shore, between the mouth of the Pursh-Pursh River and Cape Ratmanova, roughly the same area as the observations of Mityai in 2013. According to Lisitsyn the whales he observed appeared to be feeding.

During discussion of these observations Mate noted that one of the gray whales satellite-tagged by his team off Sakhalin in August 2011 (Agent) travelled somewhat farther south along the coast than the Vostochny Reserve, reaching the latitude of 49°15'N on 15 November 2011. Mate also noted that Agent, when compared to the other tagged whales, travelled at a relatively slow rate (average 1.6 km/hr) but had the largest core area (154 km<sup>2</sup> in the Offshore feeding area) and largest home range (3158 km<sup>2</sup>).

### 7.5.3 Kamchatka

Vertyankin reported that in 40 days of observation (end of May through June 2014) in Vestnik Bay 23 gray whales were seen. One of the whales was photographed and found to be already in the Kamchatka catalogue. In 2015 surveying did not begin in Vestnik Bay until mid-July and in two weeks of effort only one gray whale was seen; no photographs were obtained.

Six to eight individual gray whales were observed in Olga Bay in the summer of 2014 and also in 2015. A series of photographs were taken and submitted to Tyurneva for identification. In 2015 there was limited effort in Olga Bay (due to a shortage of funding) but in July approximately 24 gray whales were sighted along a 30 km stretch of coast and some photographs were obtained and sent to Tyurneva for processing and analysis.

### 7.5.4 Records of gray whales elsewhere in the western North Pacific

A gray whale was sighted off the Pacific coast of Japan, near Kizu Shima Island in March 2015 and off Shimizu in April/May. The whale was photographically matched with a whale in the Russia-US Sakhalin catalogue, which had been recorded as a calf off Sakhalin in August 2014 (IWC document SC/66a/BRG17).

A recent publication reported on a large female gray whale that stranded on the mainland China side of the Taiwan Strait in early November 2011 after becoming entangled in a set gillnet (Wang *et al.* 2015). Comparisons of photographs of this whale with the eastern and western North Pacific catalogues revealed no matches.

## 8 POPULATION ASSESSMENT & RELATED MATTERS

### 8.1 IWC Scientific Committee work on stock structure

A second IWC Scientific Committee workshop on the range-wide population structure and status of gray whales in the North Pacific was held in April 2015.<sup>14</sup> The workshop outlined a multi-stock population modelling framework to synthesize the available data on movements, counts, photo-id, genetics and known or estimated removals with the aim of providing a basis for management advice for the entire complex of subpopulations. The modelling approach involves developing a range of stock structure hypotheses rather than focussing on a single one, and then determining (a) which ones are consistent with the available data and (b) what are the management implications of each hypothesis. A. Punt of the University of Washington, Seattle, has been commissioned by the IWC to develop the model. An outline of the model is given in IWC document SC/66a/BRG/2 available at [iwc.int/sc66adocs](http://iwc.int/sc66adocs).

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<sup>14</sup> [iwc.int/sc66adocs/SC-66a-Rep08.pdf](http://iwc.int/sc66adocs/SC-66a-Rep08.pdf)

The workshop emphasised the value of pooling genetic data to enable more powerful analyses to be performed, and strongly encouraged the institutions and scientists involved to collaborate.

A provisional analysis (IWC document SC/A15/GW2) was presented to the workshop of the movements between Sakhalin and the eastern North Pacific. This addressed the question of whether (a) the number of matches confirmed to date between Sakhalin and the eastern North Pacific is sufficient to account for the entire Sakhalin group of whales or (b) some of them must migrate elsewhere. The analysis showed that the answer depends on assumptions about the age structure of whales migrating past California. If the whales there are representative of the whole population, then the number of matches to date is insufficient to account for the whole Sakhalin group. The answer is sensitive to the age distribution because juvenile gray whales (with the exception of calves) are underrepresented in the Mexican catalogues, which are based mainly on observations within the lagoons. This matter will be considered further at the next IWC workshop.

A further workshop is planned for April 2016 to review progress on stock structure modelling and movement analyses. This will be followed by a mini-workshop to update the range-wide Conservation Management Plan in the context of the co-ordination established by the Memorandum of Cooperation, which so far the USA, Japan and the Russian Federation have signed.

## **8.2 Progress on cross-matching between the IBM and Russia-US photo-ID catalogues**

The two photo-ID teams operating off Sakhalin (the Russia-US and IBM teams) have regularly exchanged catalogues over the years. The first exchange was in 2007 and there have been five subsequent exchanges. The latest was in May 2013, involving whales catalogued up to and including the 2011 field season. In each case except the first, the procedure has been as follows:

- (1) each team sends its catalogue to the Project Manager at IUCN;
- (2) when both catalogues have been received at IUCN, each team's catalogue is forwarded to the other team simultaneously;
- (3) each team matches its catalogue against the other team's catalogue, and makes a table of suspected matches - 'temporary whales' (those lacking some aspects) are included in the matching and the table of suspected matches is sent to IUCN;
- (4) the Panel reviews the two lists of suspected matches.

In recent years, the two lists of suspected matches have agreed exactly or very nearly so.

The Panel recommended last year (Recommendation 14/008) that the matching exercise be repeated to cover data collected during 2012-2013. The Russia-US team supplied its catalogue (including whales identified up to and including 2013) to IUCN in April 2015.

Lock informed the Panel that the companies supporting the Sakhalin Energy/ENL Joint Programme now want to re-examine details of the arrangement, and requested that IUCN send them a formal proposal.

Given that the data from the 2014 season have been processed, the Panel **recommends** that the matching exercise include whales photographed through the 2014 season. Because the matching exercise now works routinely (or had until recently), the Panel considers that, to save labour, it is sufficient for each team to match the other team's new additions for the years 2012-2014, plus any new aspects (e.g. right side, left side, flukes) of whales previously catalogued.

The Panel thanks each photo-ID team for its contributions to the matching exercise to date and hopes that the matching update can be accomplished before GWAP-17.

## **8.3 Update on population assessment 2014**

### *8.3.1 Update*

Cooke presented document GWAP 16/17 which contains the results of a population assessment model applied to the Russia-US dataset 1994-2014. The model framework used is similar to previous years. It is an individual-based, stage-structured model, with a time step of one year. The stages include calves, immature animals, mature males and mature females divided into three reproductive classes: lactating, pregnant and resting. The 'lactating' stage includes all whales that had a calf in the given year, even if the calf was

already weaned when the whale was encountered. The ‘pregnant stage’ includes only whales which are currently pregnant and which will bear a live calf in the coming winter and bring it to the feeding grounds next year. Thus the modelled pregnancy rate is lower than the ‘true’ pregnancy rate because not all pregnancies are successful and not all calves safely reach the feeding grounds.

The best-fitting model, based on the Akaike Information Criterion (AIC), included the following factors:

- Stage-specific availability for sampling (i.e. some stages, such as mothers with calves, are more likely to be sampled than others);
- Individual-specific availability (some whales are seen more regularly than others);
- Correlated annual variation in pregnancy rate and calf survival rate at the population level;
- No individual variation in reproductive rate;
- Constant non-calf survival rate;
- No immigration;
- Male-biased sex ratio (but only marginally preferred over a 50:50 sex ratio).

The mature female population is estimated to have been 44 in 2015 (with 95% confidence interval (CI) 38-49). The aged 1+ population (i.e. all animals except calves) is estimated to have been 174 (CI 158-191) or 186 (CI 171-203) depending on assumptions. The population has been growing at an average rate of 3.8% per year (CI 2.8-4.8%). Forward projections, on the assumption that average conditions remain unchanged, predict a continued increase.

The best-fitting model had a common set of annual deviations from the median for ‘pregnancy’ rate and calf survival rate which together determine the effective reproductive rate. The estimated rate was lowest in 2008. Projections forward show that if this low rate became the norm, the population increase would likely stop (see Fig. 6 in document GWAP 16/17).

### 8.3.2 Panel discussion and conclusions

The Panel had noted in 2009 (see GWAP-6 report) that the distribution of whales in 2008 differed considerably from that in previous years with monitoring, especially with regard to an observed major shift distribution resulting in the nearly total absence of whales in the most northern portion of the Sakhalin near-shore study area. Results of the Sakhalin Energy/ENL benthic monitoring programme presented by Fadeev (2009) and reviewed by the Panel showed that biomass densities of the major taxonomic categories of benthic prey of gray whales measured in 2008 were similar to those measured in previous years. The rapid decline in the relative abundance of whales in the Sakhalin near-shore feeding area during September 2008 was temporally coincident with the onset of two different types of relatively loud industrial activity in the region, namely the 2008 Elvay seismic survey which is believed to have been operating through most of September and into October, and the resumption of on-land pile driving (which was a relatively novel sound source in the vicinity of the feeding area) at the ENL Odoptu site on 10 September.

The Panel concluded in its GWAP-6 report that with the current state of knowledge, the precautionary approach would be to act on the assumption that the shift in distribution evident in 2008 was caused by some aspect of anthropogenic disturbance, and that this may have negative implications for feeding success and ultimately reproductive success. In 2008 there were multiple intense sound sources overlapping and one of these was pile-driving, which had been uncommon in the area before this year. In trying to examine potential causes for the shift in distribution it is unclear to what extent either or both of these factors were salient. The Panel noted at the time that effects on calving success and survival could only be determined retrospectively, and would not be discernible until further years of data had been processed and incorporated into the population assessment model. Whilst not conclusive, and recognising that influences elsewhere in the range can also affect reproductive success and survivorship, the results presented in GWAP 16/17 are consistent with a hypothesis that reproductive success was compromised by the disturbance of 2008.

The Panel **stresses** the exploratory nature of these analyses, and the lack of direct evidence for a causal relationship between disturbance and reproductive success. Nevertheless, the Panel considers that this kind of analysis could be useful within a framework for addressing the question of how much disturbance is compatible with continued recovery of the population.

The issue is particularly relevant now, in that 2015 may have been an exceptionally high disturbance year because of the multiple seismic surveys, two of them having overlapped the Piltun feeding area, and 2016 may also prove to be a high disturbance year, given the plans by ENL to resume construction and pile-driving at the Piltun spit.

The Panel notes that population assessment provides one of the most important indices of cumulative impacts, albeit with the drawback that there is inevitably a delay of several years between the impact and the ability to detect a signal in the demography. The Panel **emphasises** the importance of continuing the collection of photo-id data for use in regular population assessment updates.

Determining the maximum allowable level of disruption to important activities (such as feeding) consistent with population recovery is scientifically difficult, but it is central to the Panel's mandate. The Panel **encourages** further work on this issue and in particular on ways to use this kind of information in the context of a strategy for managing cumulative effects.

#### **8.4 Plans for update of joint population assessment**

The Panel has on several occasions in the past recommended that a population assessment be conducted combining the data from all photo-ID teams. The last such joint population assessment, using IBM and Kamchatka data through 2011 and Russia-US data through 2013, was presented in document GWAP-14/35, with the main results summarized in the 14th GWAP report.

The population assessments use the annual sighting histories of each whale, and thus involve more data than the catalogues alone, which contain just one entry per individual whale. The Panel is concerned about the quite large variation between different versions of the IBM dataset. The GWAP-14/35 population assessment used an electronic copy of the IBM dataset transmitted via K. Broker in January 2013. It covered the years 2002-2011. A comparison of these data against the latest version of the IBM Sakhalin dataset published in the March 2015 report to the Ministry of Natural Resources and Ecology (MNR) of the Russian Federation (document GWAP-16/8, Table A5) showed that nearly 20% (40 out of 205) of the 2002-2011 sighting histories differ between the two versions.

In order to conduct a new joint assessment, a definitive version of the IBM dataset is required, re-compiled from original records if necessary. The Panel **recommends** that the parties involved ascertain whether it is feasible to reconstruct a definitive version of the IBM dataset. If it is not feasible to reconstruct the dataset back to 2002 (the first year of field work), the possibility of constructing a dataset with a later starting year should be considered.

## **9 ADDRESSING CUMULATIVE & RANGE-WIDE ISSUES**

### **9.1 Update on Guidelines for Monitoring and Instructions for Mitigation Measures for Large Cetaceans during Industrial Activities on the Shelf of the Russian Federation Far Eastern Seas**

#### *9.1.1 Presentation*

A. Vladimirov provided a presentation on the status of the "Guidelines on Monitoring of Large Cetaceans during Industrial Activities on the Shelf of Far East Seas & Instruction on Measures to Mitigate Impacts on Large Cetaceans during Industrial Activities on Russia's Far East Shelf." This document is being prepared by the Russia's Marine Mammal Council on behalf of the MNR as part of a joint project with the United Nations Development Programme (UNDP) and Global Environment Facility (GEF). According to Vladimirov, all comments had been received on the "Guidelines on Monitoring of Large Cetaceans during Industrial Activities on the Shelf of Far East Seas" by April 2015, at which time the MNR and the Federal Service of the Supervision of the Natural Resource Usage of the Russian Federation (Rosprirodnadzor, RPN) requested that the 'Guidelines' document and the 'Instruction' document be combined and their scope expanded. The first draft of "Instruction on Measures to Mitigate Impacts on Large Cetaceans during Industrial Activities on Russia's Far East Shelf" was completed in March 2015, and the first draft of the combined document was produced in August 2015. In September 2015, this combined document was presented to the project working group on biodiversity in the oil and gas sector and sent to stakeholders, with



comments requested by 15 November. By the time of GWAP-16, Vladimirov had received comments from six companies, notably not including Sakhalin Energy or any of the three NGOs to which the document had been sent for comment. Vladimirov stated that comments were due by 14 December, and that the latest version would then be distributed to stakeholders for a final discussion at the 23 December meeting of the project working group on biodiversity. He further indicated that the final version of the document was to be submitted to MNR for the endorsement process in January 2016.

### 9.1.2 Panel discussion and conclusions

During discussion, Vladimirov clarified that the term ‘large cetaceans’ in the document title had been defined to mean the ‘great whales’, of which a large proportion occur in Russian seas.

The Panel noted that it had been listed as an ‘official reviewer’, its comments on an early draft (of the monitoring guidelines only) were contained in the GWAP-14 report (item 12) and it had stressed there that considerably more work was required. However, nothing further had been seen by the Panel. The Panel **stressed** the importance of such guidelines and **emphasised its willingness** to provide advice on the document. Vladimirov stated that the document could be made available, and that the official submission could be delayed to allow for comments from GWAP as well as others in the IUCN network. At the time of this report, it was not clear when (or if) the full document, with all comments from the oil companies, would be made available to the Panel for review and comment.

When asked whether the guidelines would be voluntary or mandatory, Vladimirov indicated that they would not be mandatory but would be issued initially as recommendations to allow for ‘testing’, after which time the plan is to work with companies and encourage them to incorporate the guidelines into their standards and practices.

## 9.2 Update on US guidelines for acoustic thresholds of disturbance

Southall provided a short summary of recent and current efforts to update noise exposure criteria for marine mammals, following on Southall *et al.* (2007) and applying more recent scientific data. Multiple, inter-related efforts are under way. These include a formal process initiated in 2014 by the National Oceanic and Atmospheric Administration (NOAA) to implement federal rule-making procedures in the United States by adapting the Southall *et al.* (2007) criteria within U.S. federal regulations, incorporating significant scientific findings that have become available since 2007. A document describing this process in detail can be found on NOAA’s website<sup>15</sup> and on the Federal eRulemaking Portal.<sup>16</sup> A U.S. Navy technical report referenced in the NOAA document (Finneran, 2015) provides guidelines that are meant to update and improve upon the original Southall *et al.* (2007) criteria.

Additionally, a collaboration of oil exploration and production (E&P) companies managed through the E&P Sound and Marine Life Joint Industry Programme (JIP)<sup>17</sup> is supporting a substantial update of the 2007 noise exposure criteria, expanded to include all marine mammal species. This process is under way now but publications are not expected to appear until 2017. Sound sources are being considered in categories of activity (e.g. seismic surveys, pile driving, shipping) rather than simply making the distinction between impulsive and non-impulsive sounds. Separate, but inter-related papers are expected that consider hearing, the effects of noise on hearing and the effects of noise on behaviour.

## 9.3 Update on IWC disentanglement training programme

Donovan noted that the IWC’s effort to develop a disentanglement training programme for Russian waters is continuing. Funding sources are being investigated and the IWC specialist, David Mattila, is working with Russian authorities to work out the practical details, including suitable candidates for training, under the IWC guidelines.

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<sup>15</sup> <http://www.nmfs.noaa.gov/pr/acoustics/guidelines.htm>

<sup>16</sup> <http://www.regulations.gov>

<sup>17</sup> <http://www.soundandmarinelife.org/>

## 9.4 Oil and gas activities on Sakhalin Shelf other than those of Sakhalin Energy

### 9.4.1 Presentation

Berzina presented an update on a mapping project and associated detailed information compilation that she has been leading for IUCN since 2013 (internal document package GWAP-16/18). The goal of this project (requested by the Panel in 2012) is to provide information and make available an interactive tool for visualizing and tracking industrial development and other human activities with potential impacts on western gray whales. The initial emphasis has been on activities on or near the whales' Sakhalin feeding areas and the broader Okhotsk Sea with additional layers of data radiating out from there added as time allows. In addition to maps, *per se*, geo-referenced information on each project or activity is provided and both the maps and the information can be filtered in a number of ways, e.g. stage of development of a hydrocarbon field, operator name.<sup>18</sup>

Among the more significant projects (besides ENL's Sakhalin I project) is Rosneft's development of the Lebedinsky field which is very near shore and underlies the northern portion of the Piltun feeding area (see GWAP letters to Russian government officials of 5 December 2009 and 19 April and 19 May 2010<sup>19</sup>). Based on publicly available sources, Berzina reported that this project was still in the exploration phase. In 2014 the license was renewed granting Rosneft the rights to conduct exploration and production of hydrocarbons in the Lebedinsky field. Subsequently, in December 2014, Rosneft published a tender for engineering and geological surveys and seismic microzonation, including seismotectonic studies at the Lebedinsky field, but no further details are publicly available concerning what aspects are completed or planned. According to Berzina, it has been mentioned in the media, as well as other public forums, that Rosneft initially planned to start production in 2016-17, however, it is unclear whether this target still stands as the company published tender in November 2015 for project and technical documentation development related to the Lebedinsky field infrastructure development/construction, with due dates in mid-2016. It is understood that the Lebedinsky project, if and when it goes ahead, could involve slant drilling from shore and may not include the construction of an offshore platform.

Another project of concern to the Panel is Rosneft's development of the North Chayvo field which lies to the south of the Piltun feeding area but has been described as having a "high average [gray]whale density in most years" (Cooke 2015). A decision was made in September 2014 that this field would be developed jointly by Rosneft and ENL and indeed at least a portion of the North Chayvo block was included in the ENL seismic survey programme in the summer of 2015. Cooke (2015) estimated that the seismic survey of the North Chayvo block planned for the summer of 2015 had the potential to cause substantial noise disturbance to gray whales. According to the publicly available sources reviewed by Berzina, shipments of crude oil from North Chayvo began in November 2014 and future plans include the development of five onshore well complexes.

Other projects of interest and concern because of their proximity to the gray whale feeding areas are Sakhalin-3 Vostochno-Odoptinsky and Ayashky blocks (Gazprom) as well as Veninsky block (Rosneft, Sinopec), all in various stages of exploration, and Sakhalin 3 Kirinsky block (Gazprom), which is in the development and production phase.

Berzina closed her presentation by stressing that this project has consisted primarily of an internet search (i.e. only publicly available information) using keywords in Russian and English and drawing from websites of oil and gas companies, associations and service providers; Russian governmental bodies; industry regulators; Russian and international media; and NGOs as well as from tender documents. She acknowledged the important ongoing help received from a PhD student assistant, Zanda Krukke. Given the total reliance on publicly available information, there are numerous spatial and temporal gaps. It is often unclear, for example, whether an activity announced as planned for a particular year actually did or did not take place. Details regarding timing and scope of an activity are sometimes not provided publicly. When a tender is announced,

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<sup>18</sup> See GWAP-12/020 recommendations at <http://ow.ly/WNgZO> and background at [http://cmsdata.iucn.org/downloads/wgap\\_14report\\_final\\_en.pdf#page=10](http://cmsdata.iucn.org/downloads/wgap_14report_final_en.pdf#page=10) & [https://cmsdata.iucn.org/downloads/wgap\\_13\\_report\\_final\\_15\\_oct\\_2013\\_en.pdf#page=13](https://cmsdata.iucn.org/downloads/wgap_13_report_final_15_oct_2013_en.pdf#page=13)

<sup>19</sup> [http://www.iucn.org/wgap/wgap/public\\_statements/](http://www.iucn.org/wgap/wgap/public_statements/)

there may be no published follow-up on the outcomes/results of the commissioned activities (or with regard to ecological research associated with the operations). Also, some companies provide no public indication of whether monitoring and mitigation programmes are associated with their operations, and even if they do have such programmes, there may be little information publicly available on what these consist of and how they are implemented.

#### 9.4.2 Panel discussion and conclusions

The Panel thanked Berzina and her team for their work on this project and once again emphasized the importance of having more detailed, timely information on other human activities that could affect the conservation status of western gray whales, both at Sakhalin and elsewhere in their range.

The Panel anticipates addressing the issue of cumulative impacts in greater depth during 2016 as it engages with Sakhalin Energy and the Lenders on the subject of the International Finance Corporation's (IFC) Performance Standards on Environmental and Social Sustainability (PS), and specifically IFC PS 1 which relates to EIA (see item 11.2.1, below).

Although it was not discussed in depth at this meeting, the issue of ENL's planned construction activities in and offshore of the mouth of Piltun lagoon, as well as inside the lagoon, has been raised previously by the Panel (GWAP-14 report, item 10) and by the IWC Scientific Committee (*J. Cetacean Res. Manage.* 16, Supplement, 2015, p 32, items 10.6.2 and 10.6.3) and continues to be regarded as a potentially major threat to the whales because of the associated noise and environmental disturbance.

Several suggestions were made by meeting participants regarding ways to supplement the information currently provided. Besides requesting help from regulatory agencies and the IWG, IUCN was encouraged to present the information as compiled by Berzina and Krukke and invite stakeholders to check it for accuracy, completeness etc. It was also suggested that given the recent and expected increases in ship traffic through the Bering Sea and into areas frequented by western gray whales (including on migration), it would be useful to expand the search for information to include volume and routing of this traffic. Berzina agreed to consider these suggestions.

### 9.5 Population Consequences of Disturbance

The Panel noted and briefly discussed several recent publications that are important to the consideration of cumulative effects of noise exposure at the local population scale. These publications have resulted from a concerted effort to study the population consequences of disturbance (PCoD). King *et al.* (2015) recently developed an interim framework (building on New *et al.* 2013, 2014) to calculate potential population-level effects of disturbance. This framework applies a structured method of expert elicitation regarding potential behavioural and physiological effects within a stochastic population model to identify levels of disturbance sufficient to affect population parameters.

Another recent study considering gray whales generally (Villegas-Amtmann *et al.*, 2015) applied a similar approach that is particularly applicable to the assessment of potential effects of disturbance on western gray whales. In this study, a bioenergetics model was used in which the costs of disturbance are directly linked to potential losses of energy, and the consequences of this loss for different age, sex, and reproductive status are considered. The model results indicated a very high (and ultimately population-level) sensitivity of reproduction to disturbance of pregnant females. Specifically, Villegas-Amtmann *et al.* (2015) found that, using this bioenergetic model, an energy deficit of just 4% across the feeding season is predicted to ultimately result in a female's failure to produce and wean a viable (i.e. healthy at weaning) calf. Higher levels of energy deficit could be tolerated for successful lactation or impregnation (30-37%), but slightly higher levels still (40-42%) were estimated to result in female mortality. While some uncertainties and considerable assumptions are clearly involved in these kinds of assessments, such modelling approaches that use demographic parameters to make explicit predictions of population-level effects are promising. Any future large-scale potential disturbance should be evaluated relative to the predictions presented for gray whales by Villegas-Amtmann *et al.* (2015).

## 9.6 Update on fisheries activities off Sakhalin in 2015 and beyond

### 9.6.1 Presentation

Tsidulko began this session with a slide presentation on his opportunistic observations of salmon fishing activities and gray whales at Piltun in July 2015.

Seven fishermen were operating at the time, using 1500m-long nets set from shore. Each net was set as a wall, held in place by floats and weights and with traps set at intervals along its length. Tsidulko provided images of some of the anchors being used and noted that they could represent risks of injury to bottom-feeding whales. Tsidulko observed whales moving close to the nets but obtained no direct evidence of entrapment or entanglement while in the field.

Tsidulko ended his presentation by reminding participants of the whale ‘Ponchik’ that was observed in summer 2013 with a rope round its caudal peduncle. This animal was observed a year later apparently healthy and no longer entangled (see document GWAP-14/Inf.5 and GWAP-14 report, item 13.1.1).

Tsidulko provided new information and photographic documentation concerning a weathered whale carcass found by a hunter on 10 October 2010 on the south-eastern coast of Sakhalin. The hunter who photographed the carcass estimated that it was 8 m long. Line associated with the carcass, as shown in photographs, led experts to conclude that entanglement could not be ruled out as the cause of death (37 entanglement experts were contacted via the IWC’s entanglement experts’ network). Features of the carcass shown in photographs were used by R.L. Brownell, Jr. (pers. comm.) to identify the animal as a gray whale.

### 9.6.2 Panel discussion and conclusions

The Panel would be interested in any information that could shed light on questions concerning how gray whales respond to salmon fishing gear (e.g. avoidance, attraction) and **recommends** that during analyses of the whale distribution and behaviour data, the Company give specific attention to this matter.

Lisitsyn and others including Samatov confirmed the information provided in internal document GWAP-16/20 (and in the media) that salmon runs in north-eastern Sakhalin were well below expectations in 2015. The cause(s) of this are uncertain although it has been suggested that climatic conditions played a role, and at least local effects from seismic survey activities cannot be ruled out.

Vertyankin mentioned that the photo-ID teams working in areas with nets in the water take special care to avoid pursuits that could lead to entanglement. Also A. Vladimirov mentioned that when he was working with Sakhalin Energy’s team at Piltun in the summer of 2013, he noticed that the whales appeared to sense the presence of nets and turned away before colliding with them. He raised the important issue that, apart from or in addition to the entanglement risk, the placement of nets in the near-shore whale feeding area creates the potential for interrupting the whales’ movements, with uncertain implications for feeding, socializing, resting etc. This could be of particular significance for mothers and calves that tend to occupy waters very close to shore.

The fisheries issue has been a concern of the Panel for several years and this is reflected in its previous reports (GWAP-14 items 13.1 and 13.2) and statements of concern<sup>20</sup>. Although less progress has been made in addressing the issue than was anticipated in the GWAP-14 report, IUCN and the Panel remain committed to pursuing it further in 2016. This will include a concerted effort to provide the kind of analysis requested by the Sakhalin Oblast Ministry of Environment Protection and Natural Resources, that is, “an authoritative analysis ... explaining differences in gear types and terminology, and summarizing the state of knowledge concerning relative risks of trapping or entangling large whales” (GWAP-14, item 13.2).

## 9.7 Update on cruise ship visits to Piltun

Berzina provided a brief update of her and her team’s compilation of information on cruise-ship companies known to have advertised or offered cruise itineraries that included visits (or at least potential visits) to the Sea of Okhotsk and the Sakhalin gray whale feeding areas in 2015-2017 (internal document GWAP-16/19). As is the case for the mapping project (item 10.4, above), this compilation is based entirely on

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<sup>20</sup> [https://cmsdata.iucn.org/downloads/wgap\\_soc\\_re\\_salmon\\_fishing\\_letters\\_to\\_russian\\_authorities\\_07082013.pdf](https://cmsdata.iucn.org/downloads/wgap_soc_re_salmon_fishing_letters_to_russian_authorities_07082013.pdf)

publicly available information obtained from a web search and content analysis, with assistance from Krukle. Although it is clear that visits to the Piltun area, specifically to observe the gray whales, continue to be advertised by some tour companies as one of the attractions of their expeditions, there is no publicly available information on whether cruises actually visited the Piltun area in the 2015 season, nor there is any indication that this feature, or cruise activity in general, has either increased or decreased over the last year. It was noted that one of the smaller companies that had planned to visit Piltun in 2015 (Heritage Expeditions) did not get a permit in time and therefore did not go.

The Panel expressed its appreciation to Berzina and Krukle for continuing to track this issue.

### **9.8 IWC Memorandum of Cooperation on Western Gray Whale Conservation: Status, plans to update and expectations from the Panel**

The major activities under the Memorandum of Cooperation at present relate to: (a) encouraging other range states to participate; (b) updating the IUCN/IWC Conservation Management Plan that forms a key part of the Memorandum (as noted under Item 8.1, a mini-workshop will be held in April 2016 to update the rangewide Conservation Management Plan and members of the Panel will be involved in this process); and (c) preparing for a multi-stakeholder workshop on the implementation of the plan in 2017/18. IUCN will be involved on the Steering Group for that workshop.

The Panel welcomes this information and strongly **encourages** IUCN to continue to collaborate with IWC on these issues.

### **9.9 Update on gray whale tagging plans and general updates on new information on tag design, health impacts etc.**

This subject was touched on only briefly at this meeting and all parties recognized that a much more extensive discussion would be needed to reach consensus on how best to proceed with tagging efforts in the future. Therefore it was not possible to go much beyond what was summarized in the report of GWAP-14 (item 18).

Mate indicated that there was still some possibility of more tagging of Sakhalin gray whales in 2016 but that 2017 was more likely. This will probably depend largely on interest from oil companies and their willingness to contribute funding, as well as on the outcomes of discussions within various forums including the IWC Scientific Committee, GWAP and IWG. Major technological advances continue to be made, and this means there is a growing range of viable tagging options, including: (1) satellite-linked implantable long-term tags that provide location information across many months to help define large-scale movements and distribution, (2) minimally invasive satellite-linked ‘dart tags’ that provide data on location and dive/depth information over 1-3 months and (3) non-invasive tags that provide detailed information on short-term local movements, behaviour (vocalization rates, acceleration/deceleration etc.) and environmental characteristics (e.g. acoustics). Some of the shorter-term but higher-resolution sensors may require recovery of the instruments to access at least some of the data (i.e. there may not be a satellite link). Thus far, only the long-term, deep-implantable tags have been used with Sakhalin gray whales (Mate *et al.* 2015) although the other types of tags (including dart tags, digital acoustic recording tags, or DTAGs, and advanced dive behaviour (ADB) tags) have been used with gray whales elsewhere (e.g. Woodward and Winn 2006; Ford *et al.* 2012) and with many other cetacean species around the world.

The concept of using DTAGs and/or ADB tags in conjunction with the 2015 Piltun-Astokh 4D seismic survey was discussed at some length at both GWAP-14 and by the Noise Task Force at its meeting in October 2014 (NTF-7 report, item 4.5). However, no tagging of any kind was attempted at Sakhalin during the summer of 2015. The Panel **recommends** that the issue of using behavioural tags be included in the NTF agenda at its next meeting, with the expectation that available options would be evaluated and the task force would be able to provide the Panel with a list of pros and cons to consider.

The Panel reiterates its conclusion from GWAP-14, bearing in mind that most of the discussions on that occasion had concerned tagging as a component of the Company’s (or companies’) MMP(s): “... the starting point of any [tagging] study should be determining its objective(s). Once that is clear, the most appropriate tool or tools could then be selected. The tool or tools must fit the objective(s), and therefore careful deliberation is needed before making a decision on whether tagging of any form would be beneficial.” The

least invasive method required to meet the stated objectives will always be the most appropriate, particularly in the context of endangered species or populations.

The Panel anticipates further discussions of the tagging issue as it engages with Sakhalin Energy during 2016 to consider potential changes in the composition, study designs, methodologies etc. of the Joint Programme.

In response to a question regarding follow-up studies of the seven gray whales that were tagged at Sakhalin in 2010 and 2011 (Mate *et al.* 2015), Tyurneva indicated that some recent photographs from the IBM team provide good views of the tag implantation site for 'Flex', a whale tagged in 2010. In this case, a cyamid-filled 'wound' (level of healing indeterminate) can be observed where the tag was implanted. The Panel has, from the beginning of discussions concerning tagging of gray whales at Sakhalin, insisted on the importance of follow-up studies to evaluate health of the tagged individuals (and in the case of females, their reproductive performance). Based on discussions at this meeting, the desired process of collating potentially useful photographs of these individuals and having them examined systematically by experts has not taken place and is not planned to take place. In view of this situation, the Panel **recommends** that Sakhalin Energy and IUCN, in collaboration with selected Panel members, make arrangements for both the IBM and the Russia-US photo-ID teams to identify and assemble their relevant photographs and make them available for examination by an independent team of experts, to be selected and organized by the Panel co-chairs and the chair of the IWC Scientific Committee. The Panel further **recommends** that this evaluation be completed and the results taken into account during any planning and subsequent initiation of future efforts using implantable tags on Sakhalin (and other 'western') gray whales.

## 10 GWAP PLANS FOR 2016 AND BEYOND

### 10.1 Review of GWAP recommendations

Berzina presented an update on overall progress made towards implementing recommendations since the previous Panel meeting<sup>21</sup> and noted the inter-sessional efforts by all parties to review and update the status of outstanding (i.e. still 'open') recommendations. She also reminded participants how the online, searchable, public database of Panel recommendations can be accessed and used<sup>22</sup>. The database includes all recommendations, starting with the Independent Scientific Review Panel (2004-05) and continuing through the most recent GWAP meeting (GWAP-15). The cumulative total of recommendations is 539, with the majority of them related to noise issues. The IUCN portal allows these to be filtered by category, meeting/year, recommendation number, responsible party, response by Sakhalin Energy, current implementation status and keywords.

The Panel appreciates and welcomes the serious efforts that have been made over the past year by the Company and by IUCN (particularly Berzina) to update and 'clean up' the list of recommendations and their status. Around 90% of the 539 recommendations (not all of them directed at Sakhalin Energy as the responsible party) have a 'closed' status. This does not necessarily mean they were all implemented to the Panel's full satisfaction. Some were closed because they had become moot or had been superseded by another recommendation. Also, some carried the proviso that although 'implemented/resolved satisfactorily', they need to be 'tracked regularly' to confirm that implementation is continuing. The Panel does not make a recommendation unless it considers the matter 'important', although some recommendations have greater urgency or more serious implications than others (in terms of reducing risks to gray whales).

### 10.2 GWAP workplan 2016

#### 10.2.1 Context: International Finance Corporation (IFC) Performance Standards on Environmental and Social Sustainability

Hancox provided a brief summary of Sakhalin Energy's financing commitments to the Sakhalin II Phase 2 project Lenders. The existing loan agreement includes a commitment by the Company to continue funding

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<sup>21</sup> See GWAP-14 report [http://cmsdata.iucn.org/downloads/wgap\\_14report\\_final\\_en.pdf#page=10](http://cmsdata.iucn.org/downloads/wgap_14report_final_en.pdf#page=10)

<sup>22</sup> See <http://www.iucn.org/wgap/wgap/recommendations/>



an independent scientific advisory body to consider and provide advice on efforts to monitor and mitigate the potential impacts of the Sakhalin II project on western gray whales. At the time of project financing in 2005, the applicable lender standards were the 1998 World Bank Group's Safeguard Policies, which included requirements related to 'Environmental Impact Assessment and Natural Habitats'.

When the updated IFC PS were published in 2012, Sakhalin Energy voluntarily committed to adhere to them. Therefore, for the last several years Sakhalin Energy has been evaluating, in consultation with the Lenders and Ramboll Environ (the Lenders' Independent Environmental and Social Consultant for the Sakhalin II Project), how the Company's Health, Safety, Environmental and Social Action Plan and its Biodiversity Action Plan can be assured to be in compliance with all IFC standards.

IFC PS6 on "Biodiversity Conservation and Sustainable Management of Living Natural Resources" is considered especially relevant to the mandate of GWAP. Therefore both the Lenders and the Company are anticipating that in 2016 (and beyond), the Panel will take an active role in helping them determine how PS6 should be interpreted and applied in regard to western gray whales.

Among the elements of IFC PS6 that will require attention is whether any part of the Sakhalin shelf should be classified as 'critical habitat' in the sense of the standard, and what methods can be used to characterize and measure the impacts (if any) of the Sakhalin II project on biodiversity values (including gray whales) in critical habitat, and other natural habitat in the area, and what (if any) remedial or compensatory actions by the Company are needed. It will be necessary to reach a working interpretation of the concepts of 'no net loss of biodiversity in natural habitat' and 'net gain' of biodiversity within critical habitat, and of how 'biodiversity offsets' are to be defined and applied under the IFC PS. Hancox noted that while there are numerous examples where all of these elements have been applied to sedentary species and terrestrial habitats, there are very few examples that involve migratory species or marine habitats.

Hancox stressed the importance of the Guidance Notes that accompany all IFC PS and he strongly encouraged parties to become familiar with those notes as well as with the standards themselves.

#### *10.2.2 Proposed 2016 workplan*

Donovan summarized the proposed Panel workplan for 2016 which had been developed by IUCN and the co-chairs after discussions with Company and Lender representatives at a series of meetings following the GWAP Working Meeting in Gland, Switzerland in late April 2015<sup>23</sup> – meetings in Gland on 30 April 2015 and 3-4 September 2015 and another in Incheon, South Korea on 4-5 October 2015.

Beyond the Panel's longstanding responsibilities specified in its ToR, including its responsibility to review and give advice on Sakhalin Energy's routine operations and their implications for gray whales, it was proposed that the Panel's additional work in 2016 should fall under the following major headings:

- (1) Review of and input to Sakhalin Energy's IFC implementation planning with initial focus on definition and assessment of critical habitat, followed by consideration of the Company's proposed biodiversity offset strategy and revised Biodiversity Action Plan (see 11.2.1, above);
- (2) Review of revisions to Sakhalin Energy's Marine Mammal Protection Plan (MMPP);
- (3) Continued review of and input to Sakhalin Energy's monitoring and mitigation planning for future 3-D and 4-D seismic surveys of the Piltun and Astokh fields (to be led by Noise Task Force);
- (4) Review of and input to Sakhalin Energy's ongoing analyses (possibly in at least partial collaboration with ENL) of data from the 2015 seismic survey(s) (also led by Noise Task Force);
- (5) Major review of and provision of advice on the Sakhalin Energy/ENL Joint Programme, which the companies intend to renew in modified form by 2018;
- (6) Continued development of a strategy for addressing the issue of potential conflicts between western gray whales and fisheries (near Sakhalin and elsewhere in the population's range);

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<sup>23</sup> [http://www.iucn.org/gwap/gwap/meetings/gwap\\_wm/](http://www.iucn.org/gwap/gwap/meetings/gwap_wm/)

## REPORT OF THE 16<sup>TH</sup> MEETING OF THE GWAP (GWAP-16)

- (7) Continued development of a strategy for acquiring improved understanding of ecological drivers for productive gray whale feeding areas off Sakhalin;
- (8) Production of a 'good practices' publication with guidelines for marine seismic surveys, updating and expanding upon Nowacek *et al.* (2013);
- (9) Contributions to revision and updating of the IUCN/IWC Conservation Management Plan for Western Gray Whales, with input to implementation of the IWC Memorandum of Cooperation Concerning Conservation Measures for the Western Gray Whale Population (see item 10.8, above);
- (10) Review and provide comments on the UNDP/GEF Methodological Guidelines for Monitoring and Mitigation of Impact on Large Cetaceans during Industrial Activities in the Internal Seas, the Continental Shelf and the Exclusive Economic Zone of the Russian Federation (see item 10.1, above).

### 10.3 Panel discussion and conclusions

During the discussion, IUCN advised everyone that Panel meetings were anticipated in May and November 2016, subject to budgetary, logistical and other considerations. In addition, it was suggested that regular teleconferences would be desirable to sustain momentum and ensure timely delivery of advice from the Panel and task forces. These could be arranged on a quarterly or semi-annual basis according to perceived need.

With regard to task forces, it was agreed that the Panel would form two of what are essentially 'task forces of the whole' (i.e. task forces in which all Panel members participate) to begin addressing the IFC compliance and Sakhalin Energy/ENL Joint Programme review issues, listed above. It was expected that these task forces would meet in the spring, subject to the timely availability of documents, funding etc. For the Sakhalin Energy/ENL Joint Programme work, it is desirable for at least one Panel member to attend the annual Sakhalin Energy/ENL meeting in Yuzhno in late January as a way of facilitating the Panel's early and direct engagement on this issue.

It was agreed that the Noise Task Force would meet at least once in 2016 and possibly more than once, depending on the pace of Sakhalin Energy's planning for and implementation of its OBN seismic survey and its analyses of 2015 seismic survey monitoring data as well as the availability of documents, funding etc.

Given what was heard at this meeting concerning OBN technology and other developments in the field of geophysical profiling (see Item 4, above), the Panel expressed interest in an update of the white paper on alternative technologies that was prepared independently for the 2<sup>nd</sup> meeting of the Seismic Survey Task Force by John Diebold in 2008<sup>24</sup>. Sakhalin Energy welcomed this idea and agreed to take it under consideration. The Panel **requests** that Sakhalin Energy report back to IUCN on this matter early in 2016.

Finally, Observers again reminded the Panel of the importance of obtaining, well in advance, as much information as possible concerning ENL's construction plans in Piltun lagoon, including the timing, character and scale of vessel traffic (tugs, barges etc.) that can be expected in the summer of 2016. The Panel stressed that it had already expressed its strong concern about this activity (see item 10.4.2, above). Any additional comments, advice or recommendations by the Panel are more likely to have an effect if they are provided well in advance of the field season rather than waiting until May or June. Therefore, the Panel **requests** that IUCN make every effort to obtain updated information on ENL's plans and share this with the Panel early in 2016.

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<sup>24</sup> [http://cmsdata.iucn.org/downloads/seismic\\_task\\_force\\_report\\_final\\_30\\_06\\_08.pdf](http://cmsdata.iucn.org/downloads/seismic_task_force_report_final_30_06_08.pdf)



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## 12 SUMMARY OF RECOMMENDATIONS FROM THE 16<sup>TH</sup> MEETING OF THE GWAP

Recommendation Number	Cross-Reference	GWAP Recommendation	Responsible Party/Parties	Target Completion Date	Sakhalin Energy's Response
<b>2 DEBRIEF AND REVIEW OF PRELIMINARY RESULTS FROM 2015 PILTUN-ASTOKH 4D SEISMIC SURVEY</b>					
GWAP-16/01	Item 2.3.2.	The Panel <b>recommends</b> that the IO [Independent Observer] role continues to be part of future seismic surveys. Ideally, the IO's time in the field should be extended to cover the full MMP implementation period. The Panel recognises that the ToR and recruitment are the responsibility of IUCN and draws attention to the added value that was gained from having an IO who had participated in the relevant NTF and Panel discussions during the MMP development process.	IUCN, Sakhalin Energy	Next seismic survey planned for 2018 and future surveys	
GWAP-16/02	Item 2.4.	The Panel stressed the importance of undertaking thorough [post-seismic survey data] analyses [...] and <b>recommends</b> that the Company provides information (initially in some summary or synthesis form as soon as it becomes available and certainly well before the next scheduled NTF meeting) on: (a) the quantity of data available from Sakhalin Energy; (b) the quality of the data and its consistency over time (both within the 2015 season as discussed under Item 2.2 of the GWAP-16 report and amongst 2010, 2012 and 2015), especially with respect to the behavioural teams; and (c) the availability of data from the ENL survey (see Item 3 of the GWAP-16 report) and the Sakhalin Energy/ENL Joint Programme. Upon receipt [of such information], the Panel may request additional information if it feels this will assist discussions in the NTF towards developing detailed plans for analyses.	Sakhalin Energy	As soon as information becomes available and certainly well before the next scheduled NTF meeting	
GWAP-16/03	Item 2.4.	The Panel concurs with the NTF-9 recommendation for work that can be undertaken immediately to calculate cumulative acoustic exposure in the gray whale feeding area using the data recorded by all of the deployed bottom-mounted receivers. It therefore <b>recommends</b> that the Company arranges that for all available sensors for all time periods, the 5-minute averaged sound exposure level (SEL) is calculated for the following frequency bands: 10-100 Hz, 10-1000 Hz, 10-15000 Hz (or up to the Nyquist frequency). [...] undertaking the calculations for all	Sakhalin Energy	Prior to the next NTF meeting	

REPORT OF THE 16<sup>TH</sup> MEETING OF THE WGWAP (WGWAP-16)

Recommendation Number	Cross-Reference	WGWAP Recommendation	Responsible Party/Parties	Target Completion Date	Sakhalin Energy's Response
		sensors should entail only a minor addition of time [...and...] will be useful for future analyses of potential impacts on an annual basis. This work should be accomplished before the next NTF meeting.			
WGWAP-16/04	Item 2.4.	The Panel also <b>recommends</b> that ideally prior to the next NTF meeting, the Company examines the existing data [from the 2015 seismic survey] to investigate what the effect would have been on the time taken to complete the Sakhalin Energy survey if the criteria for behavioural shutdowns had been applied to all whales, and not just M-C [mother-calf] pairs, and if no A-lines had been acquired at night. The Panel is willing to assist the Company in this exercise, or indeed to carry it out, should sufficient resources be available.	Sakhalin Energy	Ideally prior to the next NTF meeting	
WGWAP-16/05	Item 2.5	<p>The Panel <b>recommends</b> that the Company improves field planning, recruitment, equipment testing and training and that it works more closely, and much farther in advance of future seismic surveys, with the Panel and NTF towards that end. In particular, the Panel <b>recommends</b> that for any future seismic survey, the Company ensures that</p> <ol style="list-style-type: none"> <li>(1) if new acoustic equipment is to be used, (a) full field testing of complete systems occurs well before the survey begins, (b) sufficient backup equipment is available in the field and (c) experienced acoustic engineers are available to conduct or oversee installation following well-tested protocols;</li> <li>(2) if additional technology (e.g. night-vision or passive acoustic monitoring equipment) is to be used so that operations can continue in poor visibility (including at night), the effectiveness of that technology must be objectively and quantitatively evaluated, in field conditions comparable to those in which it will be used, prior to its inclusion as part of an MMP;</li> <li>(3) experienced team leaders are appointed well in advance and</li> </ol>	Sakhalin Energy	Any future survey	

REPORT OF THE 16<sup>TH</sup> MEETING OF THE GWAP (GWAP-16)

Recommendation Number	Cross-Reference	GWAP Recommendation	Responsible Party/Parties	Target Completion Date	Sakhalin Energy's Response
		ideally they are deployed in the field the year before to gain familiarity with (a) protocols, (b) software/hardware, (c) classification of behaviour and (d) local conditions. It was also suggested that it may be valuable to hold refresher courses at either Yuzhno or in the field camp before the pre-seismic monitoring effort begins.			
<b>3 CONSIDERATION OF STRATEGIES WHEN SIMULTANEOUS OR SAME-SEASON SURVEYS BY MORE THAN ONE COMPANY ARE PROPOSED</b>					
GWAP-16/06	Item 3.2.1.	Any consideration of the 2015 activities would benefit from review of the ENL MMP. In response to a direct request for access, the Panel was told by ENL representatives that the programme had been submitted to the IWG in April 2015 as well as to the Russian regulators and that IUCN or the Panel was free to ask those bodies for the relevant documentation. The Panel <b>recommends</b> IUCN to approach the relevant bodies for a copy of the MMP [of the 2015 ENL seismic survey].	IUCN	As soon as possible	
GWAP-16/07	Item 3.2.3.	The Panel <b>recommends</b> that the issue of how to manage multiple seismic surveys in and near the Sakhalin gray whale feeding areas be given priority on the NTF's agenda.	NTF	Next NTF meeting	
<b>5 SAKHALIN ENERGY PROGRESS AND ACTIVITIES REGARDING SHIP STRIKE RISK MITIGATION AND OIL SPILL RESPONSE</b>					
GWAP-16/08	Item 5.1.	In order to estimate the specific ship strike risk from the crew change vessels [with regard to the proposal to increase the allowed speed for crew change vessels from the current 21 knots to the design speed of the catamarans (30-35 knots)], the following information would be needed:  (1) a breakdown of vessel transit time by (a) day/night, (b) good/poor visibility and (c) calm/rough seas;	Sakhalin Energy	GWAP-17	

REPORT OF THE 16<sup>TH</sup> MEETING OF THE GWAP (GWAP-16)

Recommendation Number	Cross-Reference	GWAP Recommendation	Responsible Party/Parties	Target Completion Date	Sakhalin Energy's Response
		<p>(2) angle and radial distance to each gray whale sighting (which together give perpendicular distance);</p> <p>(3) width of vessel surface footprint (at planing and non-planing speeds, if noticeably different);</p> <p>(4) an assessment of how much other high-speed traffic is expected in the area.</p> <p>Reasonable break points for the first item could be (a) nautical twilight, (b) 1km visibility and (c) sea state 4. The reason for the last item is that risk assessment for high-speed transits must be based on the assumption that such speeds would be generally permitted. The Panel <b>recommends</b> that such information and analyses be presented for its consideration at the next GWAP meeting.</p>			
<b>6 RESULTS OF 2014 SAKHALIN ENERGY/ENL JOINT PROGRAMME ON GRAY WHALE MONITORING AND RESEARCH AND PRELIMINARY FIELD RESULTS FROM 2015</b>					
GWAP-16/09	Item 6.1.1.	<p>Of the 14 primary AUARs [Autonomous Underwater Acoustic Recorders] deployed in the 2014 season, 13 functioned without issues for the entire period. Regrettably the unit at the Control site ... stopped working two days after deployment due to an electronics fault and thus returned essentially no data. This failure points to the obsolescence of the circuitry in the original AUARs and ... the need for redundant deployments of acoustic recorders at such sites. The Panel <b>recommends</b> that Sakhalin Energy provide a brief document by the end of March 2016, for inter-sessional consideration by the Panel, outlining a strategy for addressing this issue, including proposed locations of control sites, clear indication of the types of units to be used at these sites, and a firm timeline for deployment. The Panel's expectation is that this matter will be resolved in time for the 2016 season.</p>	Sakhalin Energy	31 March 2016	

REPORT OF THE 16<sup>TH</sup> MEETING OF THE GWAP (GWAP-16)

Recommendation Number	Cross-Reference	GWAP Recommendation	Responsible Party/Parties	Target Completion Date	Sakhalin Energy's Response
GWAP-16/10	Item 6.1.2.	The Panel <b>recommends</b> that additional time ( $\geq 0.5$ day) should be scheduled for the next NTF meeting to consider noise issues beyond the ongoing matters related to seismic surveys.	NTF	Next NTF meeting	
GWAP-16/11	Item 6.2.2.	The Panel <b>recommends</b> that all available biochemical data on whale tissues and whale prey be analysed and the results made available as soon as practical.	Sakhalin Energy	As soon as practical, with report back at GWAP-17	
GWAP-16/12	Item 6.2.2.	The Panel <b>recommends</b> further isotopic analyses of gray whale skin samples and a broader sample of prey species in order to improve understanding of the feeding ecology of this whale population.	Sakhalin Energy	As soon as practical, with report back at GWAP-17	
GWAP-16/13	Item 6.4.	The Panel <b>reiterates</b> its recommendation GWAP-12/025 that, if biopsies are to continue to be collected as part of the Sakhalin Energy/ENL Joint Programme, measures are taken to ensure reliable linkages between the biopsy sampling and the photo-ID catalogue. In cases where, despite those measures, a biopsy cannot be associated with an identified whale with certainty, this uncertainty should be reflected in the recorded data.	Sakhalin Energy	Report back at GWAP-17	
GWAP-16/14	Item 6.5.2.	... all four objectives listed in [document] GWAP-16/7 [Distribution and Abundance of Gray Whales in North-East Sakhalin Coastal Waters in August – September of 2014] are solely about collecting data. [An analysis of] the 16-year dataset [after the 2016 season] would allow a number of important questions to be addressed, for example a detailed spatial analysis could be used to describe gray whale core use areas and how (and if) they change within and between seasons and years. The Panel <b>recommends</b> that the Company prepare for this effort recognizing that it will require considerable time, funding and expertise. Finally, future studies should be more closely coordinated (especially in design) between whale distribution and feeding area ecology.	Sakhalin Energy	Report back at GWAP-17	

REPORT OF THE 16<sup>TH</sup> MEETING OF THE GWAP (GWAP-16)

Recommendation Number	Cross-Reference	GWAP Recommendation	Responsible Party/Parties	Target Completion Date	Sakhalin Energy's Response
<b>7 REVIEW OF 2014 FIELDWORK RESULTS, PRELIMINARY 2015 RESULTS, AND 2016 SCOPE OF WORK</b>					
GWAP-16/15	Item 7.2.2.	The Panel ... <b>recommends</b> that additional SI [stable isotope] and/or FA [fatty acid] analyses be conducted on [biopsy] samples from gray whales and a thorough array of known or potential prey species. The Panel believes that this avenue of investigation should be pursued in greater depth, beginning with the development of a detailed study plan that considers what can be accomplished using existing biopsies from the whales and samples from known and potential prey species, the proper methods for collection and preservation of samples, and what samples should be collected and analysed in the future.	Sakhalin Energy	Ongoing, with report back by GWAP-17	
<b>8 POPULATION ASSESSMENT &amp; RELATED MATTERS</b>					
GWAP-16/16	Item 8.2.	Given that the data from the 2014 season have been processed, the Panel <b>recommends</b> that the matching exercise include whales photographed through the 2014 season. Because the matching exercise now works routinely (or had until recently), the Panel considers that, to save labour, it is sufficient for each team to match the other team's new additions for the years 2012-2014, plus any new aspects (e.g. right side, left side, flukes) of whales previously catalogued.	Sakhalin Energy, IBM photo-ID team, Russia-US photo-ID team, IUCN	As soon as practical	
GWAP-16/17	Item 8.4.	In order to conduct a new joint [population] assessment [that includes not only Russia-US data but also IBM data], a definitive version of the IBM dataset would be required, re-compiled from original records if necessary. The Panel <b>recommends</b> that the parties involved ascertain whether it is feasible to reconstruct a definitive version of the IBM dataset. If it is not feasible to reconstruct the dataset back to 2002 (the first year of field work), the possibility of constructing a dataset with a later starting year should be considered.	Sakhalin Energy and IBM photo-ID team	As soon as practical	

REPORT OF THE 16<sup>TH</sup> MEETING OF THE GWAP (GWAP-16)

Recommendation Number	Cross-Reference	GWAP Recommendation	Responsible Party/Parties	Target Completion Date	Sakhalin Energy's Response
<b>9 ADDRESSING CUMULATIVE &amp; RANGE-WIDE ISSUES</b>					
GWAP-16/18	Item 9.6.2.	The Panel would be interested in any information that could shed light on questions concerning how gray whales respond to salmon fishing gear (e.g. avoidance, attraction) and <b>recommends</b> that during analyses of the whale distribution and behaviour data, the Company give specific attention to this matter.	Sakhalin Energy	As soon as practical	
GWAP-16/19	Item 9.9.	The Panel <b>recommends</b> that the issue of using behavioural tags be included in the NTF agenda at its next meeting, with the expectation that available options would be evaluated and the task force would be able to provide the Panel with a list of pros and cons to consider.	NTF	Next NTF meeting	
GWAP-16/20 A&B	Item 9.9.	(A) the Panel <b>recommends</b> that Sakhalin Energy and IUCN, in collaboration with selected Panel members, make arrangements for both the IBM and the Russia-US photo-ID teams to identify and assemble their relevant photographs [of tag implantation sites and 'wounds' of the seven gray whales that were tagged at Sakhalin in 2010 and 2011] and make them available for examination by an independent team of experts, to be selected and organized by the Panel co-chairs and the chair of the IWC Scientific Committee.  (B) The Panel further <b>recommends</b> that this evaluation be completed and the results taken into account prior to any planning and subsequent initiation of future efforts using implantable tags on Sakhalin (and other 'western') gray whales.	Sakhalin Energy, IUCN, GWAP Co-Chairs and IWC SC Chair, IBM and Russia-US photo-ID teams	Part (A): As soon as practical  Part (B): Prior to any future planning to tag whales at Sakhalin	



## ANNEX 1. LIST OF PARTICIPANTS

### Panel Members Present

Alexander BURDIN  
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*\* Apologies: David Weller, Alexey Yablokov (Emeritus)*

## REPORT OF THE 16<sup>TH</sup> MEETING OF THE WGWAP (WGWAP-16)

### **Sakhalin Energy Investment Company Ltd.**

Stephanie Lock  
Andrey Samatov  
Mike Donaghy, MDA Ltd.  
Roberto Racca, JASCO  
Marko van der Veen (Day 1)

Bastian Blonk (Day 1 & 2)  
Olga Tyurneva, IBM FEB RAS  
Valery Vladimirov, VNIRO RAS / Marine Mammal  
Council (Day 2 & 3)

### **IUCN**

Giulia Carbone  
Anete Berzina

Simon Delany (Rapporteur)

### **Observers - Lenders**

Jonathan Hancox, Ramboll Environ  
Bruce Mate, Ramboll Environ

Jean-Marie Tassel, Mizuho Bank Ltd.

### **Observers - NGOs**

Alexey Knizhnikov, WWF Russia (Days 1 & 2)  
Ekaterina (Katya) Selvestru, Pacific Environment  
Ian Robinson, IFAW International (Day 1)

Maria (Masha) N. Vorontsova, IFAW International  
(Day 2)  
Anna Filippova, Campaigner, IFAW Russia  
Dmitry Lisitsyn, Chair, Sakhalin Environmental Watch  
(Days 2 & 3)

### **Observers – Russian Authorities**

Ms Svetlana Sheynfeld, UNDP Russia/GEF/MNR  
Project: "Mainstreaming biodiversity conservation into  
Russia's energy sector policies and operations"  
(Days 2 & 3)

Mr Valery Fyodorov, Ministry of Natural Resources  
and Environment of the Russian Federation (MNR) /  
Interdepartmental Working Group for the Conservation  
of the Western Gray Whale Population (IWG) (Day 2)

Mr Alexey Vladimirov, UNDP Russia/GEF/MNR  
Project: "Mainstreaming biodiversity conservation into  
Russia's energy sector policies and operations"

Ms Elena Vorontsova-Kasyuman, MNR/IWG  
(Days 2 & 3)

Ms Natalia Lukina, Representation of Sakhalin  
Governor and Sakhalin Oblast Government in Moscow  
(Day 1)

### **Other Observers**

Ervin Kalinin, Exxon Neftegas Limited (ENL) (Day 2)  
Elena Gaupman, ExxonMobil Russia (Day 2)  
Vladimir Nechayuk, Exxon Neftegas Limited (ENL)  
(Day 2)  
Anzhelika Vasilyeva, Shell Russia (Day 3)

Dimitry Lajus, St. Petersburg State University/  
IUCN/SSC Freshwater Fish Specialist Group  
(Day 1 & 2)

Vladimir Vertyankin, Kronotski Nature Reserve

Gillian Martin Mehers, Bright Green Learning  
@Atadore SARL

### **Interpreters**

Viacheslav Chudinov

Alexander Danilov

REPORT OF THE 16<sup>TH</sup> MEETING OF THE GWAP (GWAP-16)

ANNEX 2. FINAL MEETING AGENDA

<b>WESTERN GRAY WHALE ADVISORY PANEL</b>		<b>22-24 November 2015</b>
<b>16<sup>th</sup> meeting</b>	<b>World Trade Centre (WTC), Congress Centre, 2<sup>nd</sup> floor, Room “Dvina” Moscow, Russian Federation</b>	
<b>FINAL AGENDA AND TIME SCHEDULE</b>		
<b><u>Day 1 - Sunday, 22 November 2015</u></b>		<b><u>Documents / presentations</u></b>
<b>INTRODUCTIONS</b>		
08:45 – 09:00	Welcome coffee	
<b>09:00 – 09:40</b>	<b>1. Organizational matters 0:40 [Reeves]</b> 1.1 Welcome from IUCN 1.2 Co-chairs welcoming remarks 1.3 Brief introductions of all participants 1.4 Adoption of agenda 1.5 Documents 1.6 Report drafting procedures and timeline 1.7 Logistics	WGWAP-16/1 WGWAP-16/2 WGWAP-16/3 WGWAP-16/4
<b>DEBRIEF AND REVIEW OF PRELIMINARY RESULTS FROM 2015 SEISMIC SURVEY</b>		
<b>09:40 – 12:30</b> (coffee in session)	<b>2. Debrief on 2015 Seismic Survey and preliminary results 2:50</b> 2.1 Sakhalin Energy seismic survey After-action report & lessons learnt [Sakhalin Energy] 2.2 Chair’s summary of the NTF-9 meeting [Donovan] 2.3 Report of IUCN Independent Observer to Sakhalin Energy’s seismic survey 2015 [Tsidulko] 2.4 Progress (if any) and further plans for post-survey data analysis [Sakhalin Energy] 2.5 Q&A and discussion	WGWAP-16/14
12:30 – 13:30	Lunch	
<b>SAKHALIN ENERGY ACTIVITIES IN 2016 AND 2017/2018</b>		
<b>13:30 – 14:15</b>	<b>3. Update on Sakhalin Energy’s OBN survey plans for 2017/2018 0:45</b> [Sakhalin Energy and Donovan] 3.1 Sakhalin Energy’s Presentation of 2017/2018 OBN Survey plans [Sakhalin Energy] 3.2 Chair’s summary of the NTF-9 meeting [Donovan] 3.3 Q&A and discussion	WGWAP-16/15
<b>14:15 – 15:15</b>	<b>4. Plans for other Sakhalin Energy activities in 2016 and 2017 1:00</b> 4.1 Programme on MMOs and ship strikes 4.2 Oil spill response planning and drills (incl. rec.WGWAP-14/011 A/B if not completed in 2015 as recommended, and 14/012) 4.3 Other activities 2015-2019 4.4 Q&A and discussion	WGWAP-16/16 WGWAP-16/21
15:15	Adjourn	

REPORT OF THE 16<sup>TH</sup> MEETING OF THE GWAP (GWAP-16)

<b>Day 2 - Monday, 23 November 2015</b>		
08:15 – 08:30	Welcome coffee	
<b>DEBRIEF AND REVIEW OF PRELIMINARY RESULTS FROM 2015 SEISMIC SURVEY (CONTINUED)</b>		
08:30 – 09:30	<b>Special session (Item 2 continued from Day 1): Debrief on GW protection measures during ENL seismic survey in 2015 and preliminary results [ENL]</b> Presentation Q&A and discussion	
<b>REVIEW OF 2014 FIELDWORK RESULTS, PRELIMINARY 2015 RESULTS, AND 2016 SCOPE OF WORK</b>		
09:30 – 11:00	<b>5. Results of 2014 and preliminary field results of 2015 Sakhalin Energy/ENL Joint Programme on Gray Whale Monitoring and Research</b> 1:00 [Sakhalin Energy] 5.1 Acoustics 5.2 Benthic and hydrology (including rec. 14/010) 5.3 Photo-ID and biopsy 5.4 Distribution 5.5 Results of Integrated Analysis 5.6 Q&A and discussion	GWAP-16/5 GWAP-16/6 GWAP-16/7 GWAP-16/8 GWAP-16/9 GWAP-16/10 GWAP-16 /INF.1
11:00 – 11:15	Coffee break	
11:15 – 12:00	<b>6. Results of 2014 and preliminary results of 2015 Sakhalin Energy's other programmes and activities</b> 0:45 6.1 MMOs and ship strike avoidance (incl. rec. GWAP-14/003 & 004) 6.2 Oil spill response planning and drills (incl. rec GWAP-14/011 A&B) 6.3 Q&A and discussion	GWAP-16/12 GWAP-16/13 GWAP-16/21
12:00 – 12:45	<b>7. Presentation on the scope of work for 2016 Sakhalin Energy/ENL Joint Programme and plans for 2017</b> 0:45 [Sakhalin Energy] 7.1 Acoustics 7.2 Benthic and hydrology 7.3 Photo-ID and biopsy 7.4 Distribution 7.5 Q&A and discussion	GWAP-16/11
12:45 – 13:45	Lunch	
<b>POPULATION ASSESSMENT &amp; RELATED MATTERS</b>		
13:45 – 14:45	<b>8. Population status assessment</b> 1:00 8.1 Recap progress/ results on IWC range-wide workshop (and associated discussion of stock structure) [Donovan] 8.2 Sakhalin Energy/ENL genetics/photo-ID analyses [Sakhalin Energy] 8.3 Progress of cross-check arrangements between IBM and Russia-US photo-ID catalogues 2012-2013 8.4 New observations outside Sakhalin feeding areas 8.5 Update on population assessment 2014 [Cooke] 8.6 Q&A and discussion	GWAP-16/17

REPORT OF THE 16<sup>TH</sup> MEETING OF THE GWAP (GWAP-16)

ADDRESSING CUMULATIVE & RANGE-WIDE ISSUES		
<b>14:45 – 15:30</b>	<p><b>9. Overview of progress on addressing cumulative and range-wide threats</b> (incl. rec GWAP-14/013) 0:45</p> <p>9.1 Cross-cutting work &amp; development of tools: 0:45</p> <ul style="list-style-type: none"> <li>• Update / status of Guidelines for Monitoring and Instructions for Mitigation Measures for Large Cetaceans during Industrial Activities on the Shelf of the Russian Federation Far Eastern Seas (developed under UNDP/GEF Project “Mainstreaming Biodiversity in the Energy Sector of the Russian Federation”) and next steps [A.Vladimirov / S.Sheynfeld]</li> <li>• Update on US guidelines for acoustic thresholds of disturbance [Southall]</li> <li>• Update on plans (if any) related to IWC disentanglement training programme [Donovan]</li> </ul>	
15:30	Adjourn	
19:00	Dinner reception	
<b><u>Day 3 – Tuesday, 24 November 2015</u></b>		
ADDRESSING CUMULATIVE & RANGE-WIDE ISSUES (CONT.)		
08:45 – 09:00	Welcome coffee	
<b>09:00 – 10:30</b>	<p><b>9. Continuation from Day 2: Overview of progress on addressing cumulative and range-wide threats</b> (incl. rec GWAP-14/013) 1:30</p> <p>9.2 Sector-wide: Sakhalin / Sea of Okhotsk 0:15</p> <ul style="list-style-type: none"> <li>• Other oil &amp; gas activities on Sakhalin Shelf [Berzina, others with information]</li> <li>• Q&amp;A and discussion</li> </ul> <p>9.3 Cross-sector: Sakhalin / Sea of Okhotsk 0:45</p> <ul style="list-style-type: none"> <li>• Update on fisheries activities off Sakhalin in 2015 and beyond [Tsidulko]</li> <li>• Update on cruise ship visits to Piltun [Berzina]</li> <li>• Q&amp;A and discussion</li> </ul> <p>9.4 Range-wide: Memorandum of Cooperation on WGW conservation/IWC: Status, future plans &amp; IWC expectations from the Panel [Donovan] 0:15</p> <ul style="list-style-type: none"> <li>• Plans to update 2010 IUCN/IWC WGW Conservation Management Plan [Donovan]</li> <li>• Update on any gray whale tagging plans and more general updates (if any) on new information on tag design, health impacts etc.</li> </ul>	<p>WGWAP-16/18 WGWAP-16/19 WGWAP-16/20</p>
10:30 – 10:45	Coffee break	

REPORT OF THE 16<sup>TH</sup> MEETING OF THE GWAP (GWAP-16)

<b>GWAP PLANS FOR 2016 &amp; BEYOND</b>		
<b>10:45 – 11:15</b>	<b>10. Review of GWAP recommendations</b> [Reeves, Berzina] 0:30	
<b>11:15 – 12:15</b>	<b>11. GWAP Workplan 2016</b> [Co-chairs] 1:00 11.1 Context: Implications of Performance Standards of the International Finance Corporation (IFC) / World Bank Group on environmental and social sustainability 11.2 Presentation of workplan proposal 11.3 Q&A and discussion	
12:15 – 13:15	Lunch	
<b>13:15 – 14:45</b>	<b>12. Post-2016 Panel</b> [open session for all participants] 1:30 12.1 TOR elements 12.2 IUCN-Sakhalin Energy 2017-2021 Agreement 12.3 Other opportunities 12.4 Q&A and discussion	
<b>14:45 – 15:00</b>	<b>13. Any other business</b> 0:15	
<b>15:00 – 15:15</b>	<b>14. GWAP-16 closing remarks</b> 0:15	
15:15	Adjourn	

## ANNEX 3. LIST OF DOCUMENTS

DOCUMENT #	TITLE	LANGUAGE	STATUS
<b>PRIMARY DOCUMENTS</b>			
<b>General</b>			
GWAP-16/1	<a href="#">Final agenda (including time schedule)</a>	English	Public
GWAP-16/2	<a href="#">Повестка дня (включая расписание)</a>	Russian	Public
GWAP-16/3	List of documents distributed in connection with the 16 <sup>th</sup> meeting of the GWAP,	English	Public
GWAP-16/4	Список документов, распространяемых в соответствии с 16м заседанием КГЗСК	Russian	Public
<b>ENL/SAKHALIN ENERGY Joint Programme</b>			
GWAP-16/5-Ru	<a href="#">Отчет по Программе мониторинга серых китов у северо-восточного побережья острова Сахалин в 2014 г. (основной доклад)</a>	Russian	Public
GWAP-16/5-En	<a href="#">The Joint Programme for the Okhotsk-Korean Gray Whale Monitoring off the North-East Coast of Sakhalin, 2014 (main report)</a>	English	Public
GWAP-16/6-Ru	<a href="#">СОСТОЯНИЕ БЕНТОСА В РАЙОНАХ ПИТАНИЯ САХАЛИНСКОЙ НАГУЛЬНОЙ ГРУППИРОВКИ СЕРЫХ КИТОВ В 2014 ГОДУ</a>	Russian	Public
GWAP-16/6-En	<a href="#">Benthos studies in the feeding grounds of gray whales, 2014</a>	English	Public
GWAP-16/7-Ru	<a href="#">РАСПРЕДЕЛЕНИЕ И ЧИСЛЕННОСТЬ СЕРЫХ КИТОВ В ШЕЛЬФОВЫХ ВОДАХ СЕВЕРО-ВОСТОЧНОГО САХАЛИНА В АВГУСТЕ-СЕНТЯБРЕ 2014 г.</a>	Russian	Public
GWAP-16/7-En	<a href="#">Distribution and Abundance of Gray Whales in North-East Sakhalin Coastal Waters in August -September of 2014</a>	English	Public
GWAP-16/8-Ru	<a href="#">ФОТОИДЕНТИФИКАЦИЯ СЕРЫХ КИТОВ (ESCHRICHTIUS ROBUSTUS) У СЕВЕРО-ВОСТОЧНОГО ПОБЕРЕЖЬЯ О. САХАЛИН В 2014 ГОДУ</a>	Russian	Public
GWAP-16/8-En	<a href="#">Photo-identification of Gray Whales (Eschrichtius robustus) off the Northeast Coast of Sakhalin Island, 2014</a>	English	Public
GWAP-16/9-Ru	Акустико-гидрофизические исследования на северо-восточном шельфе о. Сахалин с 10 июня по 6 октября 2014 г.	Russian	Confidential
GWAP-16/9-En	Acoustic and Hydrophysical Surveys Offshore Northeastern Sakhalin Island, from 10 June to 6 October 2014	English	Confidential

REPORT OF THE 16<sup>TH</sup> MEETING OF THE GWAP (GWAP-16)

DOCUMENT #	TITLE	LANGUAGE	STATUS
GWAP-16/10-Ru	<a href="#">Сводный анализ связей между аспределением китов, биомассой кормовых объектов и уровнями шумов по результатам программы мониторинга охотско-корейской популяции серых китов у северо-восточного побережья острова Сахалин</a>	Russian	Public
GWAP-16/10-En	<a href="#">Integrated Analysis: Assessment of Whale Distribution Linkages to Benthic Prey and Acoustic Sound Levels for the Okhotsk-Korean Gray Whale Population Monitoring Programme off the North-East Coast of Sakhalin Island</a>	English	Public
GWAP-16/11-En	Presentation on Sakhalin Energy/ENL Joint Gray Whale Monitoring Programme 2016 Scope of Work 2016	English	For internal use only
GWAP-16/11-Ru	Presentation on Sakhalin Energy/ ENL Joint Gray Whale Monitoring Programme 2016 Scope of Work 2016	Russian	For internal use only
<b>Marine Mammal Observer Programme</b>			
GWAP-16/12-Ru	Программа наблюдения за морскими млекопитающими в 2014 г., заключительный отчет	Russian	Confidential
GWAP-16/12-En	2014 Marine Mammal Observer Programme, Close-out Report	English	Confidential
GWAP-16/13	Gray whales and Sakhalin Energy activities: Impact assessment of proposed changes to vessel transit routes and crew transfer vessel speed	English	Confidential
<b>Oil spill preparedness and response (OSRP)</b>			
GWAP-16/21	Sakhalin Energy's presentation: Continued improvement of Sakhalin Energy's OSR capability in 2015 and 2016	English	For internal use only
<b>Seismic surveys and other potentially noise-generating offshore activities</b>			
GWAP-16/14	<a href="#">Report of the IUCN Independent Observer to the 2015 Sakhalin Energy 4-D Piltun-Astokh Seismic Survey (by G.Tsidulko)</a>	Public	Public
GWAP-16/15-Corrigendum	Sakhalin Energy's Overview Plans for Future 4D Seismic over Piltun-Astokhskoye	English	Confidential
GWAP-16/16	List of Sakhalin Energy's offshore activities, 2015-2019	English	Confidential
<b>Population assessment</b>			
GWAP-16/17	<a href="#">Updated Population Assessment of the Sakhalin Gray Whale Aggregation based on the Russia-US photo-identification study at Piltun, Sakhalin, 1994-2014</a>	English	Public
<b>Activities of other operators and sectors</b>			
GWAP-16/18	IUCN compilation of information sheets on other operator activities in the Sea of Okhotsk from the IUCN mapping exercise (including a summary overview), updated v. October 2015	English	For internal use only



REPORT OF THE 16<sup>TH</sup> MEETING OF THE GWAP (GWAP-16)

DOCUMENT #	TITLE	LANGUAGE	STATUS
GWAP-16/19	IUCN compilation of information on cruise ship visits / offers in the Sea of Okhotsk, including Piltun Lagoon (based on publicly available information), updated v. October 2015	English	For internal use only
GWAP-16/20	Summary note on the 2015 fisheries season, updated v. October 2015	English	For internal use only
<b>FOR INFORMATION DOCUMENTS</b>			
GWAP-16/Inf.1-Ru	2015 Sakhalin Energy/ENL Joint Programme Scope of Work for the Okhotsk-Korean Gray Whale Monitoring off the North-East Coast of Sakhalin	Russian	For internal use only
GWAP-16/Inf.1-En	2015 Sakhalin Energy/ENL Joint Programme/Scope of Work for the Okhotsk-Korean Gray Whale Monitoring off the North-East Coast of Sakhalin	English	For internal use only
GWAP-16/Inf.2	<a href="#"><u>NGO letter of 10 November 2015 sent to banks on concerns over the threat to the critically endangered western gray whales from seismic testing that occurred this summer in the marine environment around Sakhalin Island in the Russian Far East</u></a>	English	Public
GWAP-16/Inf.3	Wang <i>et al.</i> (2015). Short Note: Insights from a Gray Whale ( <i>Eschrichtius robustus</i> ) Bycaught in the Taiwan Strait off China in 2011. Aquatic Mammals 41(3), 327-332, DOI 10.1578/AM.41.3.2015.327	English	Public