

Table 6.3 Simplified Scoring sheet

Principle	Component	PI	Performance Indicator	RBF required? (y/n)	Likely scoring level	Rationale/ Key points
1	Outcome	1.1.1	Stock status	No	Red king crab	<ul style="list-style-type: none"> According to KamchatNIRO, abundance of red king crab and blue king crab is now on historically average level (figs. 21 and 22). Model calculations show that currently the commercial stock biomass of these species in the West Kamchatka shelf exceeds the target reference point, i.e. the level at which the high productivity should be maintained. From the results of the bootstrap analysis one may conclude that level of uncertainty of the presented estimations is satisfactory. Thus there is a high degree of certainty ($P > 95\%$) that the population is at the level above B_{lim}. Bairdi tanner crab stock shows some fluctuations since early 2000s, and now approached its historical maximum similar with levels of 2004-2006 (fig. 23). According to Ivanov (2002, 2004), this species has a number of biological features that make them highly resistant to fishing, and thus fisheries virtually cannot seriously impair the reproductive potential of this species.
					Blue king crab	
					Bairdi tanner crab	
		1.1.2	Stock rebuilding	No	Red king crab	<ul style="list-style-type: none"> The red king crab stock show considerable fluctuations, as shown by monitoring since 1920s. Serious overfishing occurred in 1990s-early 2000s, in the first extent due to large-scale illegal fishing. Limitations of fishing (seasonal, minimum commercial size, spatial) were insufficient and because of that a total ban for crab fishing was introduced in 2005-2006 and 2008-2012 accompanied with research monitoring of stock. Amount of illegal fishing considerably decreased in the early 2010s. As a result of these limitations, stock of red king crab now is considered to be in a good shape. Thus, effective management actions resulted in rebuilding of the stock. Blue king crab stock was monitored since early 1990s and also showed fluctuations with trends similar to those of red king crab. The stock declined during the late 2000s (fig. 22) most likely due to high pressure of illegal fishing, and also because of ban for red king crab which increased fishing pressure on the blue king crab. No ban for this species was introduced, although all other limitations took place. Thus role of management actions in the rebuilding of this species was not so large as in case of red king crab, but the actions were sufficient to rebuild the stock. Bairdi tanner crab stock was monitored since 1993 and, and, similarly to above two species, also showed notable fluctuations in its abundance, but these fluctuations are likely driven by natural factors and there is no reasons to
Blue king crab						
Bairdi tanner crab – N/A						

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						suggest that it was seriously depleted.
	Management	1.2.1	Harvest Strategy	No	Red king crab Blue king crab Bairdi tanner crab	<ul style="list-style-type: none"> Evaluation of the harvest strategy suggests that current fishing operations have a moderate impact on the resource, principally because the harvest is notably less than acceptable fishing mortality. The harvest strategy takes into account both biomass and fishing mortality, and sets TAC such that harvest is consistent with targets of the fishery and that actual fishing mortality does not exceed a fishing mortality appropriate for the given biomass. Fishing mortality is adjusted to stock abundance and takes into consideration illegal fishing. At the same time, until the recent time, fishing mortality associated with illegal fishing was quite high and significantly reduced (about two-fold) only during the last three-four years. Now the stock assessment uses different models, which allow to estimate both short-and long-term consequences of fishing. These models are developed for two species of king crabs and demonstrated effectiveness of accepted harvest strategy. The harvest strategy of bairdi tanner crab is based on the same principles, but its full development requires time to determine the key parameters. The fishery is automatically closed when the quota is over. Some by-catch of juveniles and females takes place, but they are released and research shows that their mortality is on acceptable level, especially if they experience only a single lifting on-board. By-catch of crab in other fisheries now is low because the main areas where it may occur are closed for bottom trawl fishing.
		1.2.2	Harvest control rules and tools	No		<ul style="list-style-type: none"> Harvest control rules are based on achieving allocated quota. Quotas in terms of percentage of TAC are allocated for each fishing company for ten years. Monitoring of crab populations is a part of overall research program of KamchatNIRO. Number of various measures which allow sustainability of the fishery are set up. While determining the TAC, the research institute uses risk-based approach, including IUU fishing in the stock assessment, to avoid stock decline with certain probability in both short-term and long-term prospective. TAC is allocated two years before the fishing season and can be corrected based on more recent data. It is not corrected based on in-season surveys.
		1.2.3	Information and monitoring	No		<ul style="list-style-type: none"> Detailed monitoring data for crab, such as catch records and various research data exist since 1957. Less detailed data are available since 1920s.

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						<ul style="list-style-type: none"> • Stock assessment existed entire period of fishery and its materials are available in the publications and unpublished materials of the research institute. Also, local branch of the FFA keeps the records on catch. • The companies keep records of time and amount of crab caught in their fisheries logbooks. Currently, the Client reports absence or very low level (less than 10% of commercial catch) of illegal fishing and a comprehensive control over fishing from the governmental enforcement structures. The management system recognizes main known uncertainties and understands that there are unavoidable uncertainties. Information on all three species is comprehensive and ecosystem of the Western Kamchatka shelf is well studied because of high significance for fisheries (Alaska Pollock. Pacific salmon, Pacific cod, halibuts in addition to crabs).
		1.2.4	Assessment of stock status	No	<p>Red king crab</p> <p>Blue king crab</p> <p>Bairdi tanner crab</p>	<ul style="list-style-type: none"> • Crab assessments are conducted annually in different seasons in different areas of the West Kamchatka shelf. Most information is obtained with bottom trawls, but blue king crab stock is assessed with traps because trawls cannot be used in the northern part of the shelf, which is a main area of blue crab occurrence. • Assessment is based on size and sex composition of catches in different locations and seasons. The data are treated using best available statistical and modeling approaches. • The stock assessments carried out for six decades, and some information is available since 1920s, i.e. beginning of Russian crab fisheries. Comprehensive information on stock assessment methodology was available for the pre-assessment. • Assessment methods and data used for issuing TACs are reviewed during phase of approval. First, on the level of the institute, when the Research Council of the institute approves forecasts issued by the research group. Second, when VNIRO (headquarter fisheries research institute in Moscow) provides forecast for Federal Agency for Fisheries (Moscow). After approval by this body and by the State Ecological Expertise the TAC goes back along this chain. Therefore, there are number of steps including independent review of the assessment methods. Potentially, the TAC may change during any of these steps, but usually it does not often happen.
	Number of PIs less than 60					<ul style="list-style-type: none"> • 0

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2	Primary Species	2.1.1	Outcome	No		<ul style="list-style-type: none"> According to information obtained from publications and specially prepared report of KamchatNIRO, non-target species are rare in this fishery. The far most abundant species in the traps was Pacific cod, which total catch, based on calculations accounted for per trap catch, period of fishing and total number of traps used in the crab fishery in 2010, was estimated to be 23,743 kg. Given that total catch of crabs in this year was 34,395 mt, proportion of cod in crab catch is less than 0.1%. Other species are even less abundant (see table 11). Several primary species (those which are officially managed with determination of TAC or possible catch) are listed in the table (Pacific salmon, redfish, halibut, flatfish), but their amount is negligible. These fish are released or used by the vessel crew. Contribution of mortality of these species is negligible in comparison with their mortality associated with target fishing. Some additional mortality can be associated with lost traps, but it is also negligible because they are open within three weeks due to decomposing of special material used in their construction. Although no special records of the amount of these species to be caught, influence of crab fishing on their status can be neglected with high confidence.
		2.1.2	Management	No		<ul style="list-style-type: none"> Number of primary species is negligible and their stock status is assessed by the research institute. Use of special threads decomposed by water allows to minimise possible bycatch by the lost traps.
		2.1.3	Information	No		<ul style="list-style-type: none"> According to information obtained during the site visit and analysis of literature (Terentiev et al 2013), number of primary species bycatch of the fishery is negligible and if it will be confirmed during further assessment (in particular, by the research institute), no further information will be needed. At the same time, data from other research carried out in 1992 (Orlov 1993) show much higher level of non-target species, including primary species though this study was performed in the different region, north-western part of the Bering Sea, these results may show temporal variation of non-target species bycatch and thus more information on bycatch in this fishery is needed.
	Secondary species	2.2.1	Outcome	No		<ul style="list-style-type: none"> Several secondary species (those are not subject for the stock assessment) are reported in study of non-target species of crab fishery (Terentiev et al 2013), but all they are in negligible amount. According to information obtained during the site visit, secondary species are absent, and if it will be documentally confirmed during further assessment (in particular, by the research institute), conclusion about absence of effect of crab fishery on by-catch species

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						populations can be made.
		2.2.2	Management	No		<ul style="list-style-type: none"> According to information obtained during the site visit, secondary species are practically absent in this fishery absent, and if it will be documentally confirmed during further assessment (in particularly, by the research institute), no special strategy will be needed. Use of special threads decomposed by water allows to minimise possible bycatch of such species by the lost traps.
		2.2.3	Information	No		<ul style="list-style-type: none"> According to information obtained during the site visit, bycatch of secondary species is practically absent and if it will be confirmed during further assessment (in particularly, by the research institute), no further information will be needed.
	ETP species	2.3.1	Outcome	No		<ul style="list-style-type: none"> According to information obtained during the site visit and analysis of available literature on potential interactions of ETP species with the crab traps, no interactions of ETP species with crab traps occurs. Thus it may be concluded about absence of risks for ETP species from this fishery. Although due to the distribution of ETP species relative to the fishing area, the fishery is highly unlikely to encounter an ETP species, it is recommended that evidence that the fishery has not had interactions be provided to the assessment team.
		2.3.2	Management	No		<ul style="list-style-type: none"> So far the Client does not have management plan or strategy for ETP species. However, if it will be demonstrated an absence of impact on ETP species, the fishery would require only a simple strategy for ETP species to maintain minimal impacts. To pass this performance indicator, the strategy would need to not only be developed, but implemented with a way to demonstrate that the strategy is actually being implemented
		2.3.3	Information	No		<ul style="list-style-type: none"> No documentation of the reportedly minimal ETP interactions occurs, but all the information available suggests actual absence of fishery effect on ETP species. That said, to pass this performance indicator, some evidence through monitoring and reporting would need to be provided in the assessment. It is suggested that information from the on-board vessel monitoring include whether or not any ETP species have been encountered and what the interaction entailed.

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	Habitats	2.4.1	Outcome	No		<ul style="list-style-type: none"> Traps are used for crab fishing on soft or hard bottoms. When put on the bottom, the traps do not move and thus their direct effect on bottom communities is negligible. Some percentage of traps is lost during a season. Their metallic frame is destroyed by marine water within two years (according to observations of fishers) and thus also do not have much effect on the habitat.
		2.4.2	Management	No		<ul style="list-style-type: none"> No strategy for addressing and restraining habitat impacts has been developed and the impact of the gear is evidently minimal. We would judge that a partial strategy is not necessary for this Performance Indicator because of the low impact of the gear.
		2.4.3	Information	No		<ul style="list-style-type: none"> Effect of crab traps on bottom communities is evidently minimal so there are no plans of its monitoring. Information from other fisheries crab also does not report influence of traps on bottom communities. It is recommended that bottom type habitat maps be generated with fishing effort location over-lays before entering full assessment to provide enough evidence to the assessment team that indeed impacts are negligible to pass this performance indicator
	Ecosystem	2.5.1	Outcome	No		<ul style="list-style-type: none"> All crabs feed of benthic animals, and often are scavengers. They are not selective to food organisms. Young crabs are used for food by predator fish such as cod, sculpins or wolffish. Proportion of total population taken by the fishery is quite low, because it takes only 10-20% of adult males, excluding females and undersized males. Therefore fishery removal only insignificantly reduces the size of population and because of this effect of fishery removal of crabs on ecosystem seems to be minimal.
		2.5.2	Management	No		<ul style="list-style-type: none"> No explicit strategy for addressing and restraining fishery impacts on ecosystem function and structure has been developed. However, given that effect of removal of crab fishery on ecosystem is probably low, no such strategy may be needed.
		2.5.3	Information	No		<ul style="list-style-type: none"> Only limited information on role of crab fishery removals on ecosystem was available during the pre-assessment. In particular, some studies address mortality of non-target crabs (females and undersized males) related to fishing operations (lifting on-board of the fishing vessel and realizing back to the sea), but more information is needed to judge about ecosystem effects of this fishery.

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3	Governance & policy	3.1.1	Legal and customary framework	No		<ul style="list-style-type: none"> • Management of fisheries is conducted according to Russian laws and regulations: • Water Resources Code; • Federal Law on the Animal World; • Federal Law on Protection of Environment • Federal Law on fishing and conservation of aquatic biological resources; • The fishery is not conducted under a controversial, unilateral exemption to an international agreement. • The framework has all the pieces required, and the management system has a transparent mechanism for resolution legal disputes. In case of conflicts, there is an opportunity to appeal to the court, and such opportunity is sometimes utilized. There were at least two cases when companies lost the fishing permit because they switched off the system of geographical positioning in their vessels. • At the same time, maintaining of the structure and function of ecosystem is not sufficiently addressed in general documents.
		3.1.2	Consultation, roles and responsibilities	No		<ul style="list-style-type: none"> • Management process is quite complicated, with involvement of number of organizations, although role of these organisations is basically clear. The process of determining forecast for catch is quite complicated and includes number of steps, however, as far as we know, during these consultations and approvals, the forecast is not changed much in comparison with primary figures provided by the research team of KamchatNIRO. TAC is allocated for fisheries subzones (two in the UoC). It is accepted by a special order of Agency for Fisheries. • There are mechanisms of change of TAC depending on the most recent information, and such changes sometimes happen. • Mechanisms for involvement of environmental and different interest groups as well as the broader community are not well developed officially. • There is no systematic in-season information on the fishery which would be publically available and would allow public or interested groups to be involved in the process.

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		3.1.3	Long term objectives	No		<ul style="list-style-type: none"> Objectives of managing the crab fisheries in Russia are maintenance of a healthy crab stocks and a long term sustainable fishery. These objectives were demonstrated, for instance, while introducing two bans for red king crab fishing in 2005-2006 and 2008-2012.
	Fishery specific management system	3.2.1	Fishery specific objectives	No		<ul style="list-style-type: none"> Sustainability of fisheries is essential for the Client because the quota is allocated to the fisheries for 10 years and because of large investments in fishery and processing. Active participation of the companies involved in the Association demonstrates their commitment to sustainability of fisheries. The Client recognises that healthy stocks of target species, and healthy ecosystem are crucial for existence of development of their business in the area. No formal management plan is accepted so far. To meet the SG80, short and long term objectives will need to be explicit in the management system
		3.2.2	Decision making processes	No		<ul style="list-style-type: none"> The government and the Client consult in the management of the fishery. Strategic decisions are made by owners of companies involved in the Association. There are mechanisms for decision-making processes to respond to issues identified in relevant research, monitoring, evaluation and consultation, timely and adaptive manner. The certification team, however, is not aware about in-season information on the fishery which is available on regular basis. This limits transparency of the decision-making process. Decision-making uses the precautionary approach and is based on best available information.
		3.2.3	Compliance and enforcement	No		<ul style="list-style-type: none"> The fishery is monitored by territorial branch of the Federal Fishery Agency. In the sea, enforcement is performed by the Federal Border Guard Service. The Client reports that they accurately follow the regulations, and enforcement performed by governmental agency is very effective. Illegal fishing for crab in the Sea of Okhotsk place was high till very recent years, but no evidences of non-compliance or significant illegal fishing have been reported during the site visits and found in the available sources during the report preparation. At the same time, illegal fishing for a long period caused a serious decline of crab populations and it was significantly reduced only during last years. Effectiveness of enforcement must be demonstrated during a longer period.

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		3.2.4	Management performance evaluation	No		<ul style="list-style-type: none"> The process of distribution of individual quota takes place now once per ten years. During this process, the management system evaluates the performance based on how they follow fishing rules, economical effectiveness and contribution to social sphere. There is an established system of external evaluation of effectiveness of the management system, State Ecological Expertise of TAC which involves experts outside the management system and operates annually.
Number of PIs less than 60:						0