



Case Study on Russian King Crab Sourcing and Traceability Pilot



2019

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Fishers retrieving a crab trap
and sorting the catch prior to
on-board processing.



Preface

Ending illegal, unreported, and unregulated (IUU) fishing remains one of the most urgent priorities for achieving healthy ocean ecosystems and protecting the welfare of hundreds of millions of people around the world who depend on fishing for their livelihoods and food security. Among the most effective ways to fight IUU fishing is to deny profits to criminals in the fishing industry by preventing illegal fish products from reaching markets. This is why governments, businesses, and civil society stakeholders have increasingly focused on a combination of fisheries monitoring, product traceability, and regulatory trade controls to ensure that all seafood reaching consumers comes from legal and responsible sources.

This case study, brought forward through a collaboration between WWF and Orca Bay Foods, LLC, demonstrates that the application of some basic tools can substantially reduce the risk of “IUU infection” even in a relatively complex and multinational supply chain. The case of king crab imported from Russia into the United States was chosen in part because this supply chain has been commonly cited in the past for its high degree of IUU risk—indeed, it served as something of a poster child example during public discussions surrounding the promulgation of the US Seafood Import Monitoring Program (SIMP).

WWF considers this to have been a successful pilot project. Although no system for eliminating IUU from supply chains can be perfect, we believe the one tested here has proved it can be robust. If maintained, the traceability system tested here can provide significant assurances to supply chain partners, regulators, and consumers.

A point deserving particular attention here is the critical role played by the combination of private-sector and government action. For its part, Orca Bay has demonstrated what can be accomplished by a motivated company in the middle of a complex seafood supply chain. Orca Bay’s willingness and ability to test a new set of internal business practices and to engage its supply chain partners were the engine that drove this effort. In addition, the regulatory and administrative reforms undertaken by the Russian government prior to the inception of this pilot were a necessary precondition of success.

This project was both ambitious and limited in its scope. We believe it has demonstrated what can be done to reduce the risks of IUU. Going forward, if the system tested here is replicated by other actors in the subsector—and if it is accompanied by some continued improvements in Russian regulatory practices (especially to increase the transparency of Russian fisheries licensing and monitoring)—it could provide a leading and durable example of how a fishery once plagued by IUU can become a “best practice” example of IUU reduction.

Acknowledgments

WWF would like to acknowledge the deep investments of time and energy given to this pilot project—including during field trips to the Russian Far East—by John Steinmetz of Orca Bay Foods, LLC, Neil Aeschliman of WWF, and especially John Simeone of Simeone Consulting, LLC, the lead consultant.



John Steinmetz



Neil Aeschliman



John Simeone

Disclaimer

This document is for educational and informational purposes only and is not intended and should not be construed as legal advice. Persons seeking legal advice on compliance with the United States Lacey Act (16 U.S.C. § 3371-3378),^[1] the US Seafood Import Monitoring Program, or any other US law, regulation, or requirement should consult with a qualified legal professional. World Wildlife Fund (WWF) makes no representation or warranty concerning the recommendations outlined in this document, including any warranty of fitness for a particular purpose, merchantability, or non-infringement. In no event will WWF be liable for consequential, incidental, indirect, special, or punitive damages, losses, or expenses (including but not limited to business interruption, lost business, lost profits, or lost savings), even if we have been advised of their possible existence. Recipients should not assume that by using the approach presented in this document they will be in compliance with any law or regulation; although this approach, if followed, will enable the company to evaluate risk of Russian crab supply chains more rigorously arising from the potential illegality of harvest or trade of the commodity. Orca Bay Foods, LLC (hereafter, the “Company”), is solely responsible for all aspects of its operations and for actions taken on the basis of the information provided in this document. As an importer of fish and seafood into the United States, the Company faces legal, financial, and reputational risks if its imports are not legally harvested and traded. The Company can seek to decrease these types of risk by enhancing trust among its trade partners, scrutinizing and verifying supply chain documents, increasing transparency, and building strict oversight of its supply chain through planned and unannounced site visits to supply chain nodes and actors.

[1] <https://www.fws.gov/le/USStatutes/Lacey.pdf> and <https://www.law.cornell.edu/uscode/text/16/3371>.



I. Introduction



Transshipment vessel
in the waters of the
Russian Far East.

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Ia. Overview and Project Origin

This project is a collaboration between World Wildlife Fund (WWF) and Orca Bay Foods, LLC, an American seafood importer, processor, and distributor. While tracking and verifying king crab need not be prohibitively arduous, US importers ought to practice a substantial amount of due care when sourcing Russian king crab given that illicit king crab harvesting from Russian waters has, in recent history, been a major problem. The range of issues that has plagued this fishery in the past extends beyond illegal crab harvesting (the “I” in “IUU” stands for “illegal”)¹ to include the problems represented by the other letters (each “U” for “unreported” and “unregulated”) —in addition to potential commingling of legally caught crab with IUU crab at key stages of the supply chain and species mislabeling fraud. WWF released an in-depth report on the topic in 2014, “Illegal Russian Crab: An Investigation of Trade Flow.”²

WWF and Orca Bay codeveloped the project’s scope to include practical solutions for two interconnected goals:

- 1) Practicing a high level of **due care** to mitigate risk and verify legality of harvest, trade, and import of Russian king crab into the US, which helps Orca Bay comply with the US Seafood Import Monitoring Program (hereafter, SIMP; see 81 FR 88975, December 9, 2016) and the US Lacey Act (16 U.S.C. § 3371-3378). The US Lacey Act outlines civil and criminal penalties for persons who “import, export, transport, sell, receive, acquire, or purchase any fish or wildlife or plant taken, possessed, transported, or sold in violation of any law, treaty, or regulation” of the United States or a foreign nation, and these penalties also extend to persons who fail to employ due care to prevent such actions from occurring.³ The requirement for importers, like Orca Bay, is to prevent illegal crab from entering their supply chain by employing due care. According to law firm Arnold & Porter, LLP, in a Lacey Act public information brief published in 2012 after the settlement of the Gibson Guitar Lacey Act case (footnotes retained from original):⁴

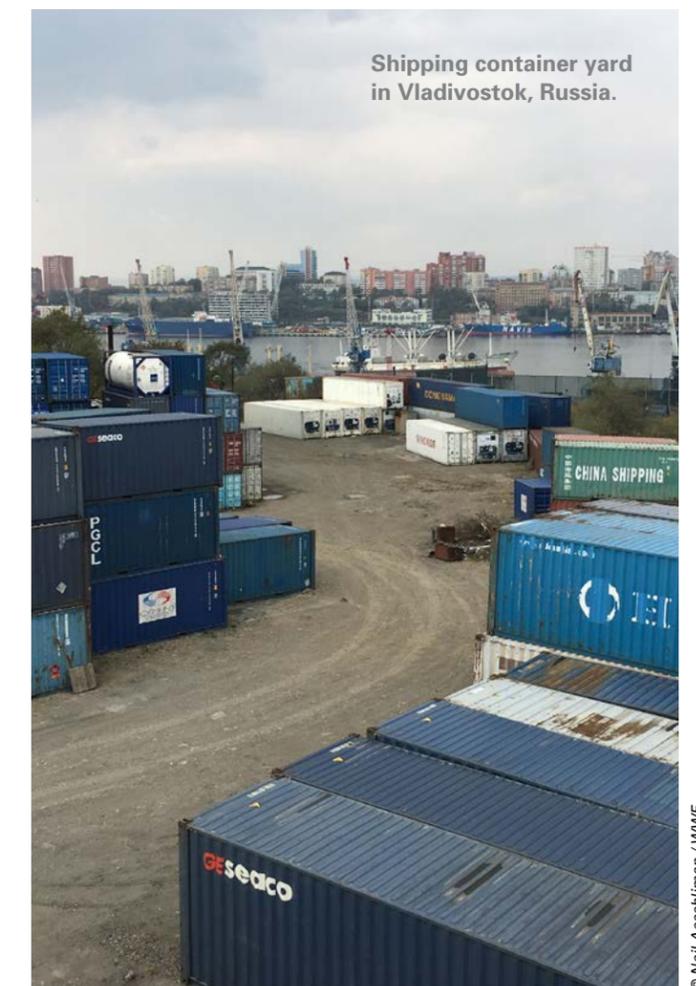
The Lacey Act requires that importers of covered products, which, in Gibson’s case, meant wood or wood products, exercise “due care” in identifying the source of their goods,⁵ but it does not spell out what importers have to do to meet this standard. **In legal parlance, “due care means that degree of care which a reasonably prudent person would exercise under the same or similar circumstances,”** and it “is applied differently to different categories of persons with varying degrees of knowledge and responsibility.”⁶ The standard is generally high in a commercial context.⁷

To address this first goal, WWF developed risk mitigation guidance for US companies importing Russian king crab that, if followed, shows a high level of due care.

- 2) Implementing a supply chain **traceability** pilot project to demonstrate best practices for responsible king crab sourcing by US importers. To achieve this, Orca Bay and one of its suppliers, together with WWF staff

from the US, South Korea, and Russia, collaborated to design and implement pilot measures across the breadth of the supply chain. **The term traceability can be understood as “the systematic ability to access any or all information relating to a food under consideration, throughout its entire life cycle, by means of recorded identifications.”**⁸

The project partners successfully demonstrated that rigorous supply chain traceability for Russian king crab imports to the US is feasible. In addition, WWF and Orca Bay believe that if the procedures developed as part of this project are mechanized and scaled, it will be possible to both practice more rigorous due care and implement supply chain traceability for all US importers of Russian king crab. Furthermore, this project may serve as a template for similar practices when sourcing other Russian-origin seafood and, even more broadly, other globally sourced seafood supply chains.



Shipping container yard
in Vladivostok, Russia.

© Neil Aeschliman / WWF

Ib. Overview of King Crab Fishery and Trade of Russian King Crab to the US

The term “king crab” is frequently used in the United States in both the consumer marketplace and the commercial crab fishing industry in Alaska; however, the term is seldom used in Russia. “King crab” is a common name classification in the US that most often refers to four species of crab: red king crab (*Paralithodes camtschaticus*), blue king crab (*Paralithodes platypus*), golden king crab (*Lithodes aequispinus*),⁹ and spiny king crab (*Paralithodes brevipes*). However, a fifth species, known as the southern Santolla red crab (*Lithodes santolla*, formerly *L. antarcticus*),¹⁰ has historically been included under “king crab” in the US international trade data nomenclature codes known as the Harmonized Tariff Schedule (HTS).¹¹

According to US Food and Drug Administration (US FDA) guidance,¹² the term “king crab” is an acceptable market name only for red king crab, blue king crab, and another type of king crab that appears to be imported seldomly into the US, the spiny brown king crab, or Hanasaki king crab (*Paralithodes brevipes*). Golden king crab must be marketed as “golden king crab.”¹³ While red santolla crab has historically included US trade and tariff code nomenclature under the “king crab” category, according to the FDA, it cannot be marketed as such. It can be marketed as Santolla, Nova, or southern red crab.¹⁴ However, industry specialists recognize that both golden king crab and southern Santolla red crab are sometimes mislabeled and marketed as just “king crab” in the US, and there is potential for all these “king crab” species to compete in the US consumer market. Therefore, in this report, unless specifically specified otherwise, the term “king crab” refers to the grouping of all five aforementioned species.

Red, blue, and golden king crab are commercially harvested only in the US and Russia, with the exception of a small fraction of red king crab commercial harvesting that occurs also in Norway. The geographic distribution of the three main species of king crab sold in the US is, broadly speaking, the North Pacific Ocean, in Alaska and in Russia’s Far Eastern Region. The population stocks between the two countries’ exclusive economic zones (EEZs) do not overlap. In addition to its native range, red king crab was introduced in the 1960s into the Barents Sea in northwest Russia, and its population has spread to be a shared stock that is commercially harvested by both Russia and Norway, though each country manages its commercial harvests differently.¹⁵

Supply of Frozen King Crab to US Market

US consumer demand for king crab has grown steadily over the past 10–15 years;¹⁶ however, the US commercial harvest of king crab steadily declined during that time. The Alaskan king crab harvest quota in 2017 was the lowest on record, just 56% of the catch from 15 years ago.¹⁷ Despite the drop in US quota, the US has continued to consistently export a large share of its Alaskan-caught king crab to foreign markets (fluctuating between 29% and 73% over the last 15-year period, with the 15-year average being 52%).¹⁸ The amount of Alaskan king crab available to consumers in the US market has remained relatively consistent over the past 15 years—ranging between 7.3 million pounds in 2017 and 8.4 million pounds 16 years ago, in 2003. US demand for king crab has consistently outpaced the amount of available king crab harvested from US waters, a gap that has been filled by imports of king crab harvested from Russian waters (hereafter, referred to as “Russian king crab”¹⁹). Russian king crab has consistently been the main source of king crab sold in the US for the past decade. For example, 80% of the king crab sold in the US in 2017 was of Russian origin, with an import value of US\$292 million (see Figure 1).

US Imports of Russian Red, Blue, and Golden King Crab Compared to Russian Quotas

The US has been the primary importer of Russian king crab by volume for more than 10 years, and therefore it has an outsize influence on the Russian king crab fishery. Recently the predominance of the US’s influence has waned, though this is a dynamic that can only be observed thanks to recent changes to US trade data codes for king crab. Historically, the US alone imported almost the entirety of Russia’s quota (total allowable catch) for red king, blue king, and golden king—e.g., 90% in 2014 (see green brackets and text in Figure 1 on page 8).²⁰ If we assume that all US imports were of legal Russian king crab (meaning, there was no IUU Russian king crab entering the US market), then based on straightforward calculations performed using Russia’s quota levels and US import trade data for king crab, other countries’ imports of legal Russian king crab had to have been negligible in 2014.²¹

Since 2014, the Russian Federal Fishery Agency (FFA) has increased quotas for red king crab (see Figure 2; the quota increases between 2014 and 2015 and between 2016 and 2017 are depicted by the red bars with dotted tops indicating the Russian quota for red king crab). Given

FIGURE 1
US MARKET SUPPLY OF FROZEN KING CRAB*

Year	DOMESTIC SUPPLY: US (Alaskan)**	FOREIGN SUPPLY: Total Imported	IMPORTED:			
			Russian	Norwegian	Southern Santolla Red Crab	From Other Countries Where Harvest Origin and/or Species Are Not Evident
2010	22.5%	77.5%	74.9%	1.2%	1.3%	0.1%
2011	18.8%	81.2%	76.3%	0.9%	3.5%	0.5%
2012	20.8%	79.2%	68.6%	3.0%	7.4%	0.2%
2013	18.5%	81.5%	66.2%	2.6%	11.6%	1.2%
2014	16.0%	84.0%	70.3%	0.3%	13.3%	0.1%
2015	17.9%	82.1%	66.1%	0.5%	15.3%	0.2%
2016	21.2%	78.8%	70.6%	0.7%	7.1%	0.3%
2017	15.2%	84.8%	80.0%	0.2%	4.5%	0.1%

Data sources: Calculations performed using data from US International Trade Commission (ITC) Dataweb (<https://dataweb.usitc.gov>), NMFS Annual Commercial Fisheries Statistics (<https://www.st.nmfs.noaa.gov/commercial-fisheries/index>), ADF&G Public News Bulletins for TAC and Guideline Harvest Level (<http://www.adfg.alaska.gov/index.cfm?adfg=cfnews.main>).

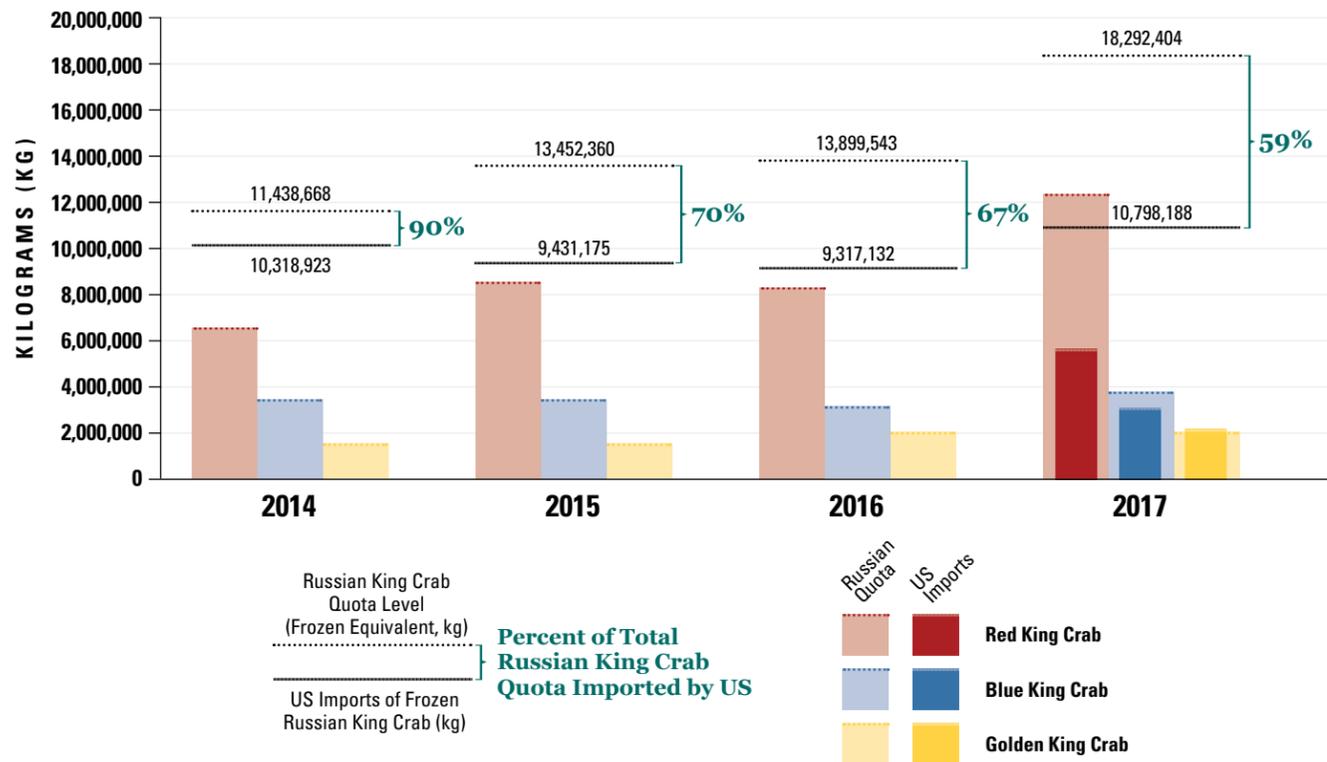
*The term “king crab” here refers to only species imported under this category in US trade data, which include red king crab, blue king crab, golden king crab, and red southern Santolla crab. Despite US FDA guidelines, industry specialists recognize that both golden king crab and southern Santolla red crab are sometimes mislabeled as just “king crab,” and therefore these calculations consider all potential “king crab” species as competing in the US consumer market. Species are much easier to differentiate when they are live than once they are boiled and frozen.

**These calculations do not take into consideration the quantity of US re-exports of king crab, since US re-export data are not broken down by species or by initial country of import. Re-exports refers to crab that was imported into the US and did not change product form in the US, but instead was then exported; for more information, see <https://www.st.nmfs.noaa.gov/commercial-fisheries/foreign-trade/raw-data/imports-exports-annual#3>. The amount of re-exported king crab from the US has ranged from 4.5% of king crab imports (2011) to 1.2% (2003), with re-exports for the most recent three years (2015–2017) ranging from 2% to 3%. Therefore, the most recent calculated percentage of US domestic supply indicated here is likely 2%–3% lower than its actual contribution to US market supply.



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FIGURE 2
RUSSIAN RED, BLUE, AND GOLDEN KING CRAB QUOTA & US IMPORTS OF THOSE SPECIES FROM RUSSIA



Data sources: Data on Russian quotas by species are available from the Russian Federal Fishing Agency (known as Rosrybolovstvo; <http://npb.fishcom.ru/> and <http://www.fish.gov.ru/>). US import data are available from US International Trade Commission (ITC) Dataweb (<https://dataweb.usitc.gov>).

Notes: 1) Prior to 2017, US Harmonized Tariff Schedule (US HTS) commodity classifications and trade data only allowed for determination of US imports of king crab overall, but were not broken down by specific species (note solid horizontal lines are only available for overall US imports of Russian king crab, and note absence of deeper saturated bars within lightly colored bars for 2014 through 2016); 2) WWF submitted a tariff code classification revision request to the US government in 2016, and after a successful ruling, the US HTS began including breakouts for US imports of king crab by species starting in January 2017. This change allowed species-specific analysis of US imports of king crab (note for 2017 data there are deeper saturated bars embedded within the lightly colored bars indicating specific levels by species of US imports of Russian king crab).



Red King Crab



Blue King Crab



Golden King Crab

the relative low demand for king crab domestically in Russia, this increase in Russian red king crab quota, and hence, harvest, appears to have been imported by other consumer countries, and is reflected by the decreasing proportion of total Russian king crab quota imported by the US each year (percentage shown in green brackets in figure) while the absolute volume of US imports has remained flat. In 2017, the US imported 59% of Russia’s total quota for red, blue, and golden king crab. Due to the added US trade codes by species, it is now evident that even though the US only imported 46% of Russia’s red king crab quota in 2017, it imported 79% and 100% of Russia’s quota for blue king crab and golden king crab, respectively. It is thus clear that while the US remains a dominant importer for Russian king crab generally, its relative importance, and hence its influence, over Russian red king crab exports has decreased.²² Nevertheless, the US remains the dominant market for Russian blue king crab, and the exclusive market for Russian golden king crab.

Ic. Short History of Efforts to Detect and Prevent IUU in Russia’s Crab Fishery

Estimates of IUU fishing for red, blue, and golden king crab from Russian waters vary from year to year, but have been consistently greater than zero for the past 25 years. The existence of overharvested and illegal Russian crab in the international market is not new, and hence much has been written on the subject over the past quarter century. IUU fishing for king crab soared during the two decades following the breakup of the Soviet Union, in the 1990s and 2000s. IUU fishing for king crab was notorious for its connections to financial crimes such as tax evasion and broader organized crime networks. The issue has been written about in media articles, industry briefings, reports by NGOs, academic journal articles, and US government proceedings.

In 2009, Russia began requiring that all vessels carrying fish and seafood caught within its EEZ be required to stop in a Russian port before sailing to a foreign port to receive official customs inspection, clearance, and export documentation. By the early to mid-2010s, Russia began to institute measures that signaled it was taking the issue of IUU crab harvesting even more seriously. Russian fishery authorities started addressing noncompliance by fishing companies by increasing penalties for overharvesting and exceeding quotas, as well as for harvesting crab in unauthorized zones. In addition to monetary fines, a company now risks losing its entire crab harvesting rights

and yearly quota if caught engaging in IUU fishing. As Russia started addressing illegal fishing issues domestically in how it managed and oversaw its own fishery, it simultaneously recognized the need for international support due to the major influence other nations had on this fishery through trade.

Russia signed bilateral agreements to prevent IUU fishing with each of its main crab trading partner countries: South Korea (signed December 22, 2009), North Korea (signed January 30, 2012), Japan (signed September 8, 2012), China (signed December 6, 2012), and the US (signed September 11, 2015).²³ Despite the increasing quantity of bilateral IUU fishing prevention agreements between Russia and many of its trade partners, into the mid-2010s there continued to be authorized Russian-flagged vessels overharvesting and exceeding crab quota, as well as Russian- and foreign-flagged vessels fishing in Russian waters without authorization to harvest crab within Russia’s EEZ.

WWF’s 2014 report “Illegal Russian Crab: An Investigation of Trade Flow” was published shortly after many of these agreements were signed but before there was significant implementation. The WWF report highlighted several instances in which illegally harvested crab was found in one of Russia’s trading partners’ ports even after bilateral agreements were signed.²⁴ Russia used the communication channels offered by the bilateral agreements as leverage in persuading its trading partners to take the issue more seriously or risk other economic losses—as Russia did with South Korea by potentially denying its right to fish for pollock from Russian waters. In addition, Russia’s Federal Security Service (FSB) and its Coast Guard, a part of FSB, have bolstered their surveillance of the waters under their jurisdiction and continue to detect and detain illegal crab harvesting activity, as well as perform joint investigative operations into other types of criminality in the crab trade, like under-invoicing and tax avoidance.²⁵

The following are recent examples of investigations conducted by the Russian FSB and Coast Guard of companies and vessels caught with illegal crab on board, as Russia forbids harvesting and transporting of all crab species by any foreign-flagged vessel within its EEZ:

- In January 2019, in a joint operation of the Far Eastern Customs’ Operation Unit, FSB, FSB Border Patrol, and verification activities by the Far Eastern Transport Prosecutor’s Office, four criminal cases

under Part 3 of Article 226.1 of the Criminal Code of the Russian Federation were filed against a group of companies for “smuggling of strategically important resources on a large scale, committed by an organized group of persons,” of almost 50.7 metric tons (111,774 lb) of live red and blue king crab, valued at 35.9 million rubles (US\$556,450). The parties falsified information on both the destination and the real value of the goods, declaring the value half of its actual market value. The haul of live crab was found to be destined for China: “The illegal export of valuable seafood was carried out by an organized group of persons. They used various companies under their control, including foreign ones, to commit crimes [...], and repeatedly smuggled valuable seafood from Russia using forged documents.”²⁶

- In January 2019, Russian authorities detected and detained a Japanese fishing vessel (*Nishino Maru No. 68*) for illegally fishing for crab in Russia’s EEZ. Russian authorities found 7.5 metric tons (16,534 lb) of live crab on board and nearby identified 206 illegally placed crab traps that were still in the sea. The vessel and crew were detained, fined 39 million rubles (US\$601,770), and then released on bail and allowed to return to Japan.²⁷

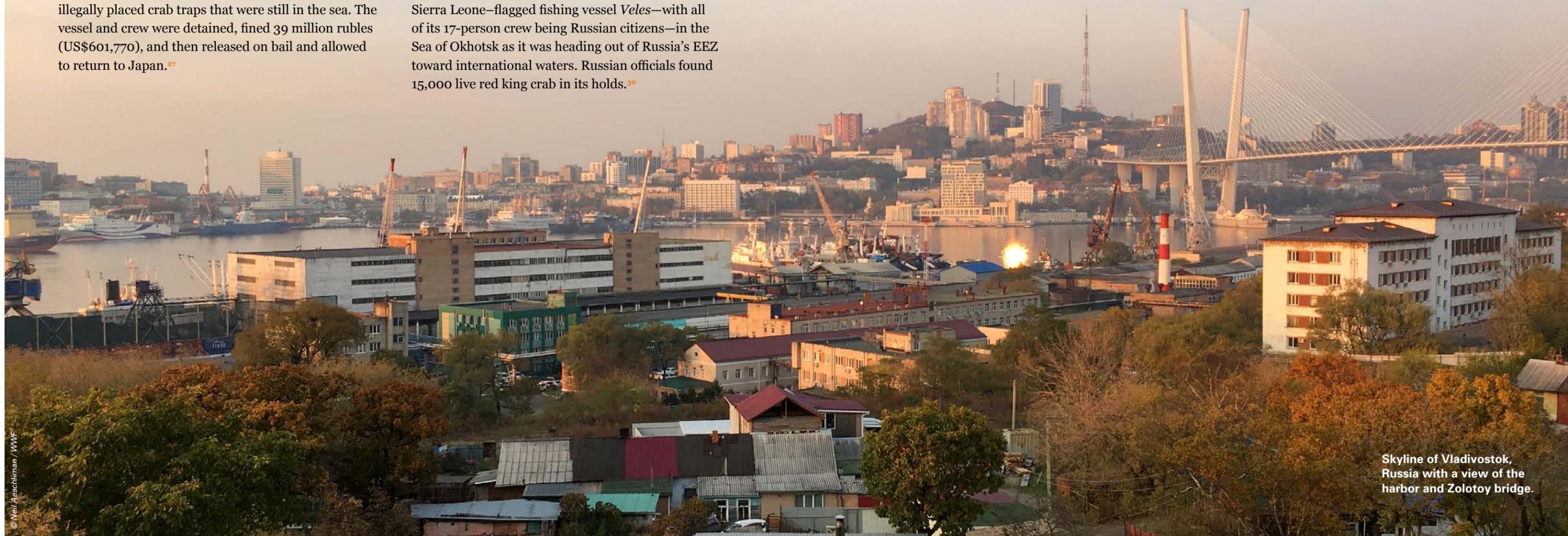
- On January 26, 2017, Russian authorities detected an unmarked vessel in the northern section of the Pacific Ocean. After repeated attempts to communicate with the vessel, and with the vessel showing signs of changing course and attempting to hide, Russian authorities boarded the vessel and determined the vessel’s name (*Virilye*) and flag country (Togo), and also established that the crew consisted of 20 Russian and Ukrainian citizens. The vessel was equipped for processing and transporting live crab, and in the holds of the vessel were more than 30 metric tons (66,138 lb) of live blue king crab.²⁸
- On January 13, 2017, Russian authorities detained a Tanzanian-flagged refrigerated transport vessel named *Amikus* in the Sea of Okhotsk near Sakhalin Island. Russian Coast Guard officials boarded the vessel after it ignored attempts at radio contact. The vessel was found to have 17 metric tons (37,478 lb) of frozen crab and 8 tons (17,637 lb) of other fish products on board.²⁹
- On July 1, 2016, Russian authorities detained the Sierra Leone-flagged fishing vessel *Veles*—with all of its 17-person crew being Russian citizens—in the Sea of Okhotsk as it was heading out of Russia’s EEZ toward international waters. Russian officials found 15,000 live red king crab in its holds.³⁰

Id. Fishery Enforcement Enhancements to Address IUU Fishing Relevant to This Project

Russia has continued to refine its domestic initiatives to improve fisheries management, regulations, and oversight. In February 2014, Russia set forth specific actions and measures it needed to undertake as part of both its commitment to the Food and Agriculture of the United Nations’ (FAO) Code of Conduct for Responsible Fisheries and its implementation of its National Action Plan to Prevent, Deter, and Eliminate Illegal, Unreported, and Unregulated Fishing, which had been approved by Russia in December 2013.³¹ Even though the Russian Federation signed the UN Port State Measures Agreement (PSMA) on April 29, 2010, it had not yet ratified it as of June 2019.³² However, on March 27, 2019, PSMA representatives and UN specialists held a seminar in Moscow with officials from key ministries of the Russian Federation—Fisheries, Agriculture, Coast Guard, Foreign Affairs, Security Service, Transport, and Customs—to discuss moving forward with Russia’s ratification of PSMA.³³

Upon initiation of this project, WWF, together with Orca Bay and one of its Russian suppliers, identified the types of monitoring, control, and surveillance (MCS) systems³⁴ and trade controls that the Russian government has fully implemented in the past several years across its commercially harvested marine resources.³⁵

In 2008, the Russian government first established the Center for Fishery Monitoring and Communications (CFMC) under the Federal Fishery Agency to monitor fishing and transshipment activities in Russian waters. Since its initial inception, CFMC has become a central analytical gatekeeper for all records and accounting related to fishing management, and has been monitoring fishing vessels for compliance with fishing management regulations.³⁶ All Russian vessels—fishing or transport—with an output of at least 55kW and weighing at least 80 metric tons (176,270 lb) must have operational Vessel Monitoring Systems (VMS) and Automatic Identification Systems (AIS) devices at all times. CFMC maintains a fishing sector-wide system for monitoring and tracking



Skyline of Vladivostok, Russia with a view of the harbor and Zolotoy bridge.

all vessel activity, known as OSM. This system is a centralized platform that stores all data related to commercial fisheries, allows for analysis and dissemination of fisheries data and statistics for fishing and transport vessels, and includes company-/vessel-specific comparisons of catch data compared to official harvest permit quantities and allowed fishing dates, as well as an overall production activity tracker that calculates each company's yearly quota fulfillment. CFMC and the OSM system are openly available to FFA, FSB, Coast Guard, fishery scientific institutes, and customs authorities. When FSB and Coast Guard inspectors perform an inspection at any of the required checkpoints (such as during transshipment between a catcher-processor harvest vessel and a transport vessel), the inspectors have access to CFMC and OSM systems to validate with the official FFA company quota and fishing permit databases that the product has inspected. In 2016, the FFA began instituting electronic daily vessel report logbooks across its fishing sectors, and the crabbing industry is now required to submit detailed digital daily vessel reports every 24 hours by satellite or radio communication.³⁷

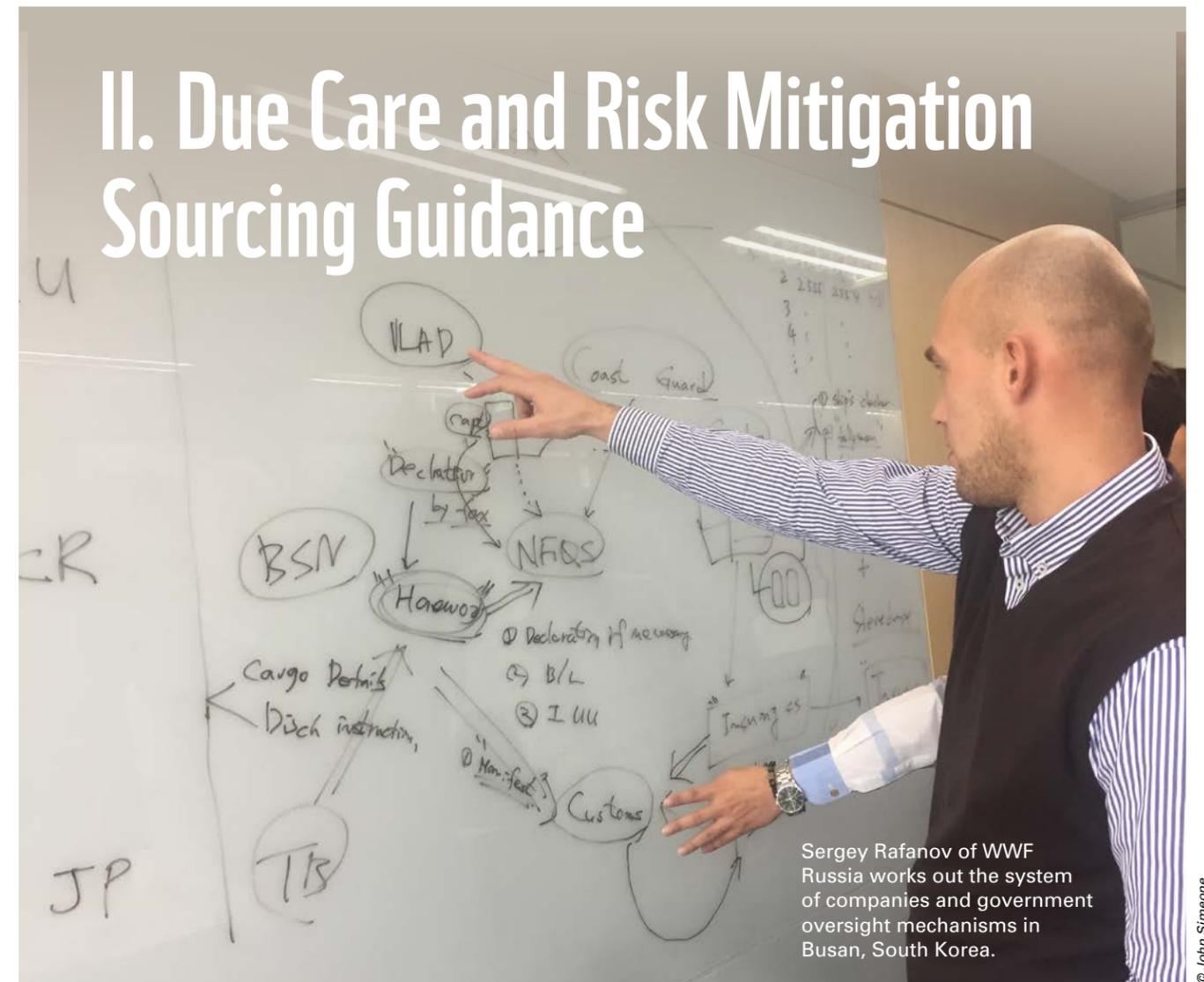
Under Russian legislation, in addition to the physical act of fishing, the actions of receiving, storing, and transporting seafood are also technically considered fishing. Since “fishing” is possible only with a vessel flagged by Russia, then those activities must also be performed exclusively by Russian-flagged vessels (except under the rare circumstances where Russia has international agreements with other countries to allow them to fish for certain species within its EEZ—as with South Korea and pollock).³⁸ From a seafood tracking perspective, this means that all fish and seafood at-sea transshipments should be taking place only between vessels that are both Russian-flagged. Most, if not all, Russian-flagged vessels that are engaged in commercial fishing have an output over 55kW and weigh more than 80 metric tons, so that fishing and transport operations can be tracked at all times using VMS and AIS.

Although this case study is focused on commercial practices for mitigating risks associated with global supply chains of Russian king crab that have a history of IUU fishing through due care and traceability, it is important to recognize that addressing IUU fishing is only one component of sustainable fisheries management.

Ie. Sustainable Fishery Management in Russia's Crab Fishery

Although this case study is focused on commercial practices for mitigating risks associated with global supply chains of Russian king crab that have a history of IUU fishing through due care and traceability, it is important to recognize that addressing IUU fishing is only one component of sustainable fisheries management. Competent regulatory authorities have taken strides to prevent the unauthorized harvest and subsequent trade through improved monitoring, control, surveillance, and trade controls. In parallel, Russian companies and fishing associations are taking additional voluntary steps to ensure that their harvests and sales are from sustainably managed fisheries not just compliant with fishery regulations. WWF recognizes the Marine Stewardship Council (MSC) fisheries standard as the most credible benchmark for sustainable fisheries management and recommends preferentially sourcing from fisheries certified to the standard. For fisheries that are unable to certify against the standard at the outset, WWF supports fishery improvement projects (FIPs)—multi-stakeholder, stepwise efforts to improve fishing practices and management with the goal of the fishery being able to enter into MSC Full Assessment. WWF requires all FIPs, including Russian king crab FIPs, to transparently post progress against workplans on [FisheryProgress.org](https://www.fisheryprogress.org), the only third-party verified website of FIP guidelines and progress that WWF currently recognizes.

WWF commends the Russian crabbers in both the Barents Sea and the Russian Far East (RFE) who have been engaging in FIPs with the goal of becoming eligible for MSC certification for certain stocks of king crab. On February 22, 2018, the Russian-origin Barents Sea red king crab fishery became MSC certified.³⁹ In the Russian Far East, the RFE Crab Catchers Association (RFE CCA) entered into a FIP beginning in 2011 and continues to work toward achieving successful MSC certification of RFE king crab.⁴⁰



Ila. The US Lacey Act and King Crab Violations

American companies and individuals who import illegally harvested seafood—whether knowingly or not—put themselves at risk of violating the US Lacey Act. The Lacey Act provides for criminal and civil penalties, which include jail time, fines, and forfeiture of seafood and vessels. In addition, products covered by the Lacey Act, including crab, that are taken in violation of a foreign government's regulations are subject to forfeiture under the Lacey Act, 16 U.S.C. § 3374(a), on a strict liability basis. In a recent case, *United States v. 144,774 Pounds of Blue King Crab*, 410 F.3d 1131 (9th Cir. 2005), an innocent owner defense was raised in the forfeiture proceedings. The court held that under the Civil Asset Forfeiture Reform Act, 18 U.S.C. § 983, the innocent owner defense cannot be asserted when the property to be forfeited is “contraband or other property that it is illegal to possess.”⁴¹

A 2011 Lacey Act case involved Russian king crab imported by a US company, Harbor Seafood, Inc. (*United States v. 112 Metric Tons of Frozen King Crab*, No. 11-334 [W.D. Wa.] [filed Feb. 24, 2011]). The company attempted to import Russian blue king crab that had been harvested by vessels that did not possess enough crab quotas or were not permitted to harvest crab in Russia. The Russian crab was believed to be transshipped through South Korea before being imported into the United States. As a result of violations of the Lacey Act and FDA regulatory requirements, Harbor Seafood, Inc., forfeited \$2.75 million worth of crab, which it later bought back from the US government at auction, essentially paying twice for the same crab. The case was settled in 2012.⁴²



Representatives of the project meeting together in Vladivostok, Russia at one of the offices of Far Eastern Fisherman.

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IIb. Risk to American Companies: Implications of the Lacey Act

The first goal of WWF’s partnership with Orca Bay was to facilitate the adoption of a high level of due care that would yield confidence about the legal status of Orca Bay’s Russian king crab imports. To address this goal, WWF developed broad-level risk mitigation guidance for all US companies importing Russian king crab. This guidance was drawn from judicially approved measures for due care use with imports of other US commodities while noting nuances specific to Russian king crab fisheries. **The recommended risk mitigation methodology that is outlined in this section should not be viewed as a guide on sourcing sustainably harvested Russian king crab; instead, it outlines recommendations any US company can pursue unilaterally to practice due care with the aim of sourcing only legally harvested Russian king crab.**

While most of the recommendations provided are specific to sourcing Russian-origin king crab, some of the information related to Russian Total Allowable Catch (TAC), quotas, and fisheries harvest permitting applies to other Russian seafood species. If the guidance provided in this document is internalized and followed by Orca Bay, the procedures suggested will help the Company establish good due-care practices and reduce risk when sourcing Russian king crab, and can serve as a template for similar practices when importing other seafood from Russia.

According to US law firm Arnold & Porter, LLP, in a Lacey Act public information brief published in 2012 after the settlement of the Gibson Guitar Lacey Act case:⁴³

With few precedents for guidance and a generally worded requirement in the statute, both regulators and affected industries naturally will look to Gibson’s Compliance Program for guidance and to supplement industry customs and standards. While developed in the context of the import of wood and wood products, these standards are a key reference point for all industries governed by the law.

Since 2012, in the context of subsequent specific US Lacey Act cases, the US Department of Justice has developed court-certified and mandated environmental compliance plans that are available publicly as part of case filings.⁴⁴ For example, in February 2016, the Department of Justice sentenced Lumber Liquidators for illegal importation of hardwood and related environmental crimes in violation of the Lacey Act.⁴⁵ Lumber Liquidators was mandated to implement a government-approved environmental compliance plan. The plan was written specifically for Lumber Liquidators and thus is not a legal prescription for how all companies must evaluate their supply chain and demonstrate due care for Lacey Act compliance. However, the publicly available, eight-page, court-approved “Environmental Compliance Plan” provides concrete examples of Lacey Act due care

procedures that US companies could seek to follow. The Department of Justice has said it may use the suggested procedures in the future to evaluate other companies’ compliance with the Lacey Act.⁴⁶

IIc. Recommendation for a Due Care Protocol and Compliance Program

A robust due care protocol, which should be part of a larger compliance program, is made up of the following principal elements:⁴⁷

1. Gather essential information
2. Assess risk
3. Mitigate risk
4. Document decisions

1. Gather essential information that describes the product being imported, including relevant supply chain information and compliance with national laws and regulations. **The legibility and readability of documents are essential.** WWF recommends that originals or high-quality digital scans be required by the company and kept on file with each separate king crab purchase. Documents are the foundation of the company’s record-keeping and are key for risk assessment.

- **Supply chain mapping:** In order for companies to be able to identify endemic risks from the structure of their supply chains, a supply chain player/company map for all of a company’s king crab supply chains should be developed that includes names and locations of the company’s primary suppliers (and owners, including beneficial owners) as well as its secondary, tertiary, etc., suppliers, including the names of all corporate entities and their roles that are involved in any way in the supply chain of king crab. An accurate and detailed supply chain map is an essential precondition to evaluating and reducing risk in any supply chain and can allow a company to more precisely pinpoint where risk levels are raised or lowered throughout its supply chain.

Gather essential information that describes the product being imported, including relevant supply chain information and compliance with national laws and regulations.

- **Identify key documentation:** Documents for compliance with Russian fishing regulations and trade controls are needed in order for companies to assess risks for individual purchases. Companies should require that the following specific supply chain documents be provided prior to importing each and every shipment, or set of shipments, of product into the US. All recommended documents are legally required by the Russian government for harvest, transport, and export of marine resources, including crab, unless specified below:
 - > Official FFA Specific Quota/Fishing Permit Certificate, which specifies the company and harvesting vessel authorized to fish
 - > Federal Far East Fishery Institute (known as TINRO) authorized frozen to live-weight conversion ratio documentation
 - > Daily fishing vessel trip report
 - > Russian Coast Guard Observation Report at transshipment at sea (from harvest vessel to transshipment vessel), including all applicable consignment and transshipment documents
 - > Any documentation requirements instituted as a result of any bilateral agreement between Russia and the foreign country of initial landing—for example, if crab is destined for South Korea, then a South Korea-Russia Proof of Legality Export Certificate is required for the product to land in South Korea
 - > RU-ENG Certificate of Catch (EU Catch Certificate), filled out after harvest by export company and validated by the Russian Federal Agency for Fisheries; the EU Catch Certificate is not required by the Russian government for exports that are not destined for the European Union, but WWF recommends that all US importers require this, **as it is one of the few documents that contain information in English**
 - > Russian Bill of Lading for Export from Russia on transshipment vessel
 - > Russian Customs Declaration for Shipment from first Russian port of call (often Vladivostok) to foreign port of landing where product is off-loaded (often Busan, South Korea)
 - > First Foreign Port Import/Transit Landing Vessel Manifest

- Recommended transaction and physical product flow documentation to assess supply chain after Russian government control jurisdiction through to US import:
 - > Complete set of documents showing location of cold storage facilities used during transit to US, names and companies involved in cold storage and transit, specific volumes and grades of crab, official transfer of ownership of the crab, invoices/purchase orders, and bill(s) of lading indicating import by the US company; these documents indicate evidence of chain of custody, product segregation, and tracking, and many of them relate to transactions to which a company is party to itself
 - > On December 8, 2016, the US released the final rule establishing a Seafood Import Monitoring Program to address IUU fishing products entering the US market. SIMP establishes, for imports of certain seafood products, reporting and record-keeping requirements intended to prevent IUU-caught and/or misrepresented seafood from entering US commerce. This is the first phase of a traceability program that requires the importer of record to provide and report key data from the point of harvest to the point of entry into US commerce. The

first phase applies to an initial list of imported fish and fish products identified as particularly vulnerable to IUU fishing and/or seafood fraud, including red king crab. All documents previously mentioned may contain data that are useful for complying with SIMP and that are recommended by WWF for demonstrating chain of custody, in case of an audit.

2. Assess risk based on the information identified in the first element, information-gathering (described above)". Companies should assess the risk of the presence of illegal crab in its supply chain based on information gathered and should use a risk-based approach to evaluate sourcing of any of the three species of Russian king crab from the country of origin, whether sourced through intermediate countries or not. Undergoing this assessment allows companies to prioritize the issues that are most critically at risk. Risk is inherent to supply chains of all types of commodities, but undergoing a thorough risk assessment as part of a due care/diligence practice ensures that mitigation measures can be targeted to the appropriate locations and to the degree or frequency necessary to mitigate the risk without being unnecessarily arduous.



Segments of king crab legs being inspected for quality and sanitation by an independent seafood inspector.



Pallets of processed, frozen crab being inspected by cold storage staff just prior to being put away in Busan, South Korea.

WWF therefore recommends that at least the following two components be a part of any risk assessment:

- Adopt risk assessment methodology comprising initial and periodic general risk assessments that a company will use to develop and target risk mitigation measures at hot spots in the supply chain.
 - > Whether a given seafood product or a specific purchase of seafood that a company seeks to import is low-, medium-, or high-risk requires evaluation of three criteria scrutinized independently of each other: source risk, species risk, and supplier risk. This assessment should be based on the supply chain mapping and external research.
 - + Species risk: Is the species subject to trade controls (Convention on the International Trade in Endangered Species of Wild Fauna and Flora or other)? Has any reputable source (such as a conservation NGO, government reports, or species-based regulations such as inclusion in SIMP) designated the species as high-risk for IUU fishing or fraudulent species substitution? Are there issues on bycatch associated with this species and fishery more broadly?
 - + Source risk: Has a regulatory authority or reputable entity (such as a conservation NGO) in the past or currently designated the fishery as being at risk of IUU fishing that undermines the efficacy of existing fishery management?
 - + Supplier risk: Does the presence of particular companies in the supply chain introduce risk? Does the past or continued behavior of a specific company introduce risk?
- Employ ongoing scrutiny to determine risks each time it makes an individual purchase or other type of transaction:
 - > Scrutinize, interpret, and assess the documents and information with an eye toward corroborating information and detecting potential discrepancies.
 - > Ask the question: Could the crab have come from the harvest companies, fishing zones, and vessels described in these documents? The most basic consideration should be whether the harvesting and transshipment events described in the authorization documents could describe the harvesting and trading of the company's imported crab products, in the time frame shown.⁴⁸
 - > Compare metrics used to quantify the weight of harvested crab to conduct a mass balance reconciliation across supply chain documents. This requires noting the weights across each of the supply chain sourcing and trade documents, as well as knowledge of the most appropriate conversion ratio for accounting for the loss of weight of processed, frozen crab from live crab.⁴⁹ Do the weights of product at various critical points conform to expectations, and is this coherent throughout the chain? Or do hard-to-explain reductions or increases in weight occur?

3. Mitigate risk if/when the risk assessment in the second element (described above) shows a risk of IUU seafood or seafood mislabeling/fraud in the supply chain. The steps a company goes through to mitigate risk depends on the type and severity of risk identified during the risk assessment, in addition to whether the company can seek alternative options for product sourcing, and whether there is established credible third-party certification available. How a company seeks to mitigate risk also depends on the risk profile of the company; for example, if, after risk assessments were conducted, two companies separately determine each has medium risk, the risk mitigation strategy and specific risk mitigation measures each company employs might differ greatly from one another.

On a corporate level, how a company handles and mitigates risk should be formalized by using standard operating procedures (SOPs), and can include the use of other structures such as environmental compliance programs, whereby individuals within a company assure compliance with environmental regulations, as well as detect, prevent, and respond to various regulatory violations. Corporate-level structures provide employees with guidelines for how to deal with large, companywide risks and risks that arise from individual transactions, or case-by-case instances. The use of guidelines like SOPs and compliance programs allows companies to minimize deviation through consistent implementation of risk mitigation measures. Additionally, companies should include in SOPs an annual review of the effectiveness of their risk mitigation measures.

SOPs should be set up and strictly followed for vetting new suppliers prior to establishing a purchasing relationship, as well as for managing existing suppliers, as they should be regularly monitored against the same vetting standards to confirm compliance. What follows is a non-exhaustive series of recommendations for mitigating risk and supply chain control measures that companies can undertake depending on the results of risk assessments.

Sourcing product from MSC-certified fisheries and through supply chains certified to the MSC chain of custody (CoC) standard is one of the best means currently available to reduce the risk of sourcing IUU product. For the supply chain of MSC-certified seafood to be marketed as such for consumers, the fishery must be certified and each supply chain actor/company must hold a valid CoC

MSC certificate. The MSC fisheries standard requires effective monitoring, control, and surveillance (MCS) systems that ensure compliance with the fishery management rules, and the MSC CoC standard gives credible assurance that a product has originated from a fishery that has been certified. WWF strongly encourages companies to give top priority to purchasing MSC-certified and -labeled products, and to urging their uncertified suppliers to move toward MSC fisheries and CoC certification as rapidly as possible.

The following list of additional measures is meant to illustrate the types of management structures and control measures that companies may choose to implement in the presence of certain types of risk, and should not be taken as a comprehensive enumeration of all available mitigation measures.

- a. Scrutinize supply chain documents.
- b. Vet and monitor suppliers.
- c. Conduct trainings for trusted suppliers on SOPs as well as other risk mitigation procedures.
- d. Cut out specific extraneous supply chain actors that the company has independently determined introduces risk from sourcing chain.
- e. Advocate for electronic compliance monitoring in the fishery as well as at-sea human scientific/compliance observers to advance understanding of marine ecosystems to allow for more refined fishery policies and management regulations, and to allow for additional transparency of fishery and supply chain information available to US companies and consumers.
- f. Perform regular site visits and inspections of direct suppliers as well as periodic visits with secondary, tertiary, etc., suppliers.
- g. Source from MSC CoC-certified entities/through MSC CoC-certified actors where possible.
- h. Invest in implementing robust supply chain traceability that includes fully transparent, secure, time-stamped, and accessible databases for all supply chain information beginning with an electronic catch documentation system that tracks and traces fishery products from the point of catch through the supply chain.
- i. Advocate/support the dissemination and translation of Russian crab management plans and crab fishery forecasts that are periodically issued by TINRO.⁵⁰

4. Document all decisions, trainings, and evaluations to show compliance with SOPs, and document the decision-making process. Each key decision should be documented and retained to demonstrate a company's adherence to its own due care procedures. Companies should have a clear procedure for making key decisions about whether to accept or reject products that seem to have higher risk, based on the company's risk analysis results for the specific product. The procedure should clearly delineate who has authority to accept or reject the purchase and import of the product, and should indicate which company parties must be notified if risk is identified. Data generated as part of SOP effectiveness and adherence should also be documented at least annually.

It is important to situate the types of due care protocols, compliance programs, risk assessments, and mitigation recommendations described above within the broader context of seafood traceability. These risk mitigation steps are not meant to supplant measures better suited to address any underlying issues of illegality in the fishery, but instead are designed for supply chains ending in the US and for the US companies that are at risk of penalties under US laws and regulations. Risk assessment and mitigation measures are critical to supply chain management and to the functioning of a robust traceability system.

Some of the assessment and mitigation recommendations can be adopted independent of (and perhaps more rapidly than) development of a traceability system and thus could be viewed as an initial phase to an overall agenda of supply chain traceability.

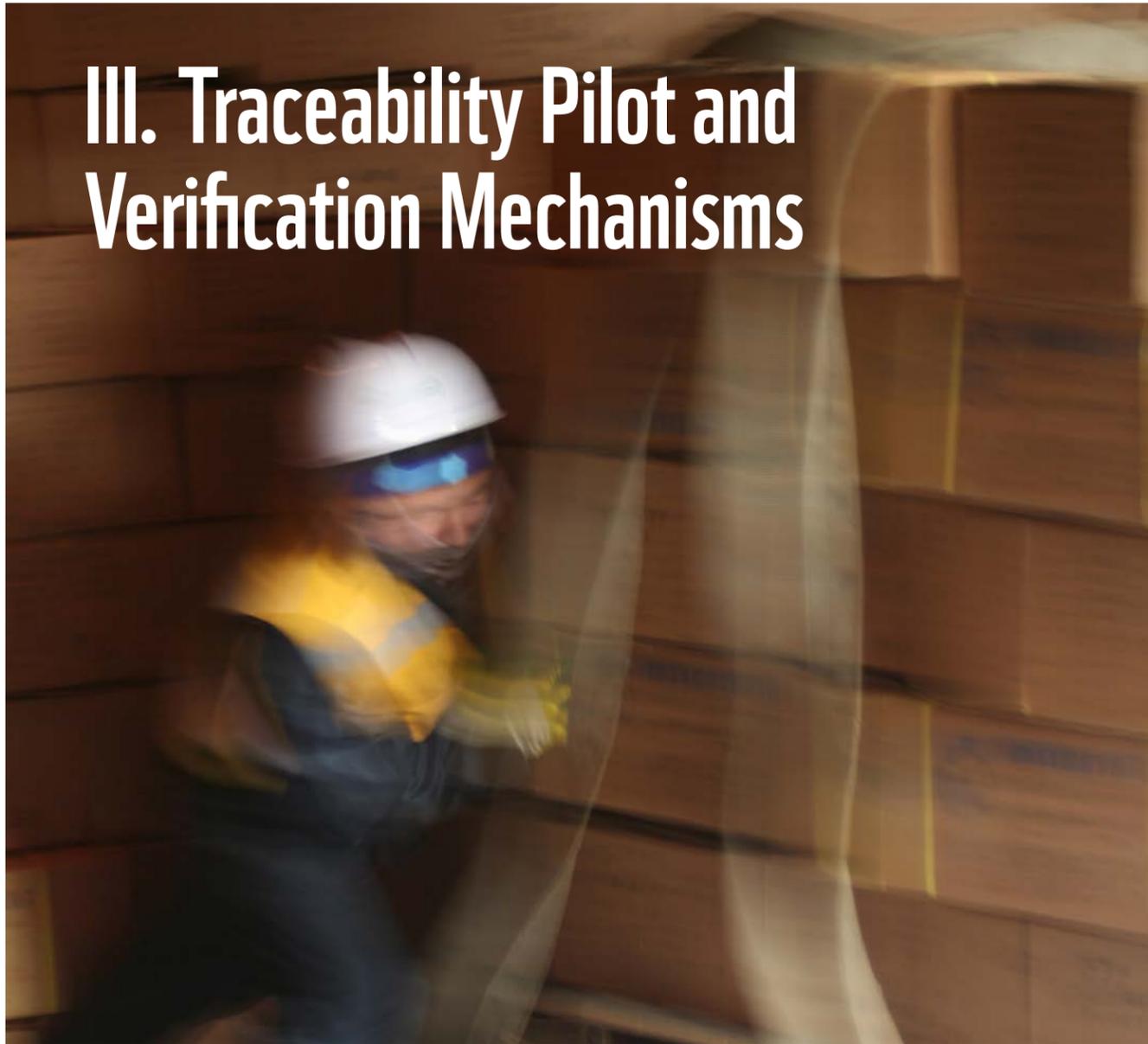
WWF recognizes that other measures that lead to supply chain traceability may require cooperation and actions by all of a US company's suppliers, or may even necessitate collective actions taken on behalf of other importers of Russian king crab. However, the sourcing guidance suggestions described above are recommendations for approaches to due care that individual companies can take independent of their suppliers or other importers. Practicing due care is not a one-size-fits-all prescription, but is instead a set of systems and procedures that each company should put in place and that are suited to each company's individual business operations. US importers can seek to decrease types of risk associated with sourcing and trading illegal crab by enhancing trust among their trade partners, scrutinizing and verifying supply chain documents, increasing transparency, building strict oversight of their supply chain through planned and unannounced site visits to supply chain nodes and actors, and developing supply chain traceability from point of harvest to US import.



Skyline of Busan, South Korea including a portion of the shipping container port in the distance.



III. Traceability Pilot and Verification Mechanisms



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IIIa. Introduction

The second goal of WWF's partnership with Orca Bay was to develop a pilot project for supply chain traceability for one set of Orca Bay's purchases and imports into the US. While Orca Bay understood that the due care procedures it followed were important measures it could take independently to assure it was not importing high-risk crab, it desired to attempt a pilot traceability project with the help of WWF for its crab imports. The subject of the pilot was blue king crab harvested in Russia's Sea of Okhotsk during January 2018 that transited through Busan, South Korea, prior to US import at the Port of Seattle.

WWF and Orca Bay aspired to design and test a proof-of-concept pilot project demonstrating supply chain traceability that would give Orca Bay assurance the physical product received was harvested legally by a Russian harvesting company and had not been fraudulently substituted in the journey. Implementation of such a pilot required cooperation along the supply chain by each of the companies involved, unlike exercising due care, which is primarily a unilateral action by the importer.

WWF, Orca Bay, and one set of companies involved in Orca Bay's supply chain successfully established an auditable design for supply chain traceability of Russian crab. WWF and Orca Bay created the traceability design, and with the help of Orca Bay's supply chain partners, WWF and Orca Bay successfully ran one pilot phase. This pilot project demonstrated that rigorous supply chain traceability for Russian king crab imports to the US is feasible. WWF and Orca Bay are encouraged by the success of the pilot phase for its traceability framework and hope it creates a template for supply chain traceability of Russian king crab that can be audited and replicated in the future.

IIIb. Product Flow Description

Before describing the traceability design and pilot phase implementation, a brief general overview of the journey Russian king crab often takes from harvesting vessel to US import is necessary. The following is representative of the journey of king crab from the pilot project but should not be considered the sole and primary way king crab enters the United States.

In the middle of the Sea of Okhotsk, within Russia's exclusive economic zone, a 176-foot (53.7-meter) fishing vessel that also has processing capabilities on board (known as a catcher-processor) sets out eight lines, each with 200 conical crab pots, that sink to the ocean floor. The vessel is fishing for blue king crab. The pots stay on the ocean floor and "soak" for approximately 24 hours, and then the crew pulls up the pots. The crab in the traps are then unloaded onto a sorting table where only males of the target species (blue king crab) above a specified, regulated size are kept. A scientific observer may be on board to tabulate the number of commercially harvestable males; non-commercially harvestable males, females, and juvenile crabs that are caught; and the presence of any bycatch (incidental harvest of nontarget species that are tossed back into the ocean). The commercially harvestable blue king crab are then boiled, cleaned, and glazed. Finally, the crab is packaged into boxes, weighed, labeled and stored within a cold storage area of the vessel.

Once the catcher-processor vessel has finished that instance of fishing, a 464-foot (141.4-meter) transshipment vessel will sail to the location of the harvest vessel and will then come alongside it for enough time

to receive pallets containing 20 boxes of frozen crab from the harvest vessel. A transshipment event, which results in the transfer of 82.1 metric tons (181,000 lb) of processed crab, can take approximately five hours to complete. Prior to the transshipment, the respective vessel captains must call the Russian Coast Guard to arrange for a Russian Coast Guard officer on a nearby vessel to board both the harvest and transshipment vessels involved in the transshipment to oversee the process. The Coast Guard officer has the mandate to review all paperwork, inspect the cargo, and generate a transshipment report. If no Coast Guard officer is able to physically oversee the transshipment process, the Russian Coast Guard has specific checkpoints in the Sea of Okhotsk—and throughout its entire EEZ—where both fishing and transshipment vessels are required to sail in order to have the transshipment event cleared.⁵⁴ After the transshipment event takes place, the harvest vessel can continue harvesting crab, or other permitted species, while the transshipment vessel sails to the Port of Vladivostok, where Russian customs officials will inspect and certify the seafood.

Once the transshipment vessel is released from the Port of Vladivostok, it then sets sail for an international transit port, like Busan, South Korea. Upon arrival in the Port of Busan, the boxed crab is off-loaded and transferred to a nearby bonded cold storage facility. The frozen crab may sit in cold storage in Busan for days to weeks as details of the sale are worked out. These details include shipping logistics, third-party US-company-requested phytosanitary testing to verify no pathogens (like listeria) are present, and formal ownership transfer. Once a US company has purchased the crab, it is loaded into a sealed 40-foot shipping container and placed onto a container vessel. The container vessel then sails from the Port of Busan to the Port of Seattle, Washington, United States. Upon the vessel's arrival, the US company that is importing the crab is notified and the container is transferred onto a truck and driven to the cold storage facility of the US importer. When the US importer receives the shipping container, the company breaks the seal that was placed on the hinges of the container when it was loaded. The US importer then unloads the individual boxes of crab into the importer's own cold storage facility.

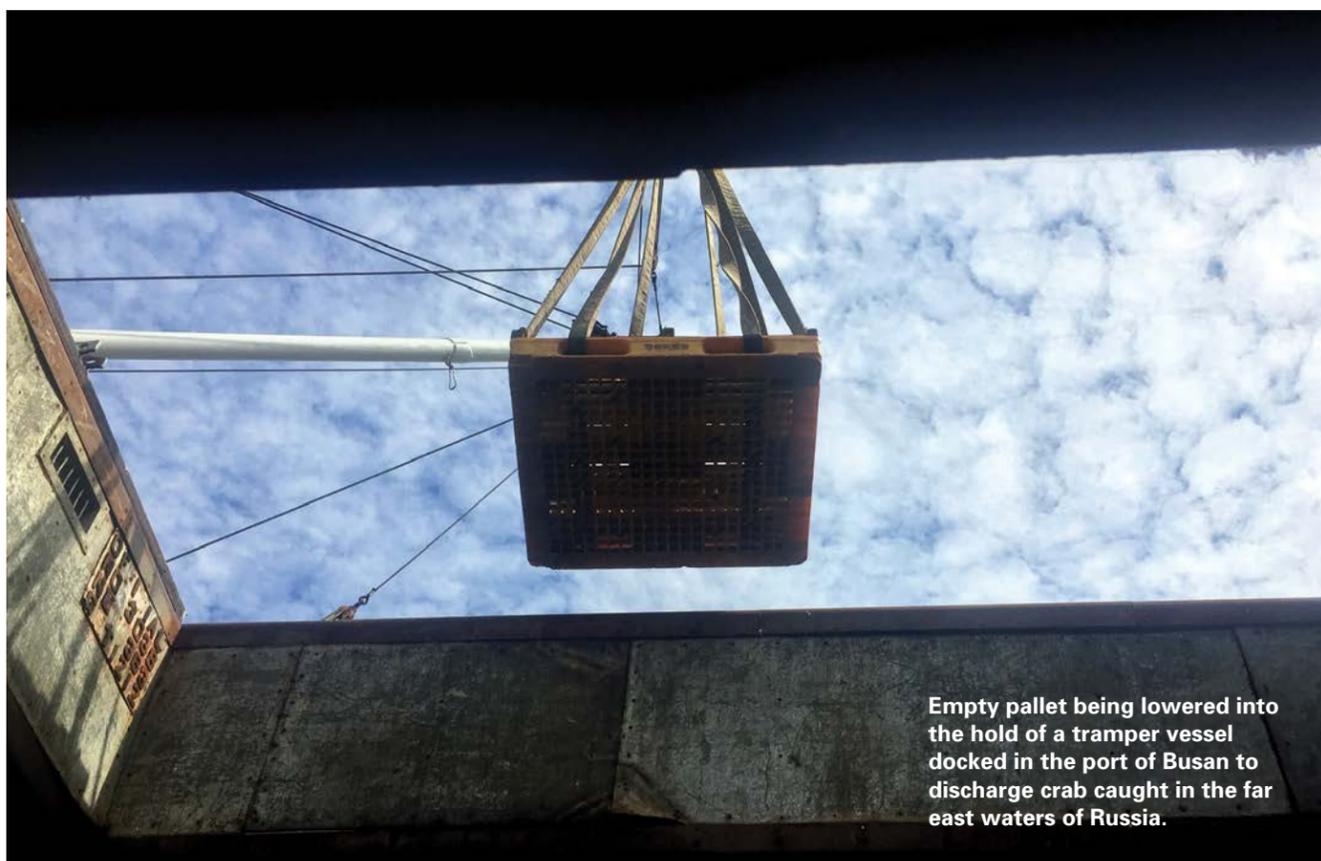
IIIc. Pilot Design and Implementation

To develop a pilot traceability design that was robust, efficient, and implementable, staff from three WWF country offices (US, South Korea, and Russia) spent significant phone and in-person time working side-by-side with staff from Far Eastern Fisherman⁵² in Vladivostok, Russia; TB Trade in Tokyo, Japan; and their partners Dongbo Corporation in Busan, South Korea, and Orca Bay in Renton, Washington, United States.

Project partners agreed that in order to achieve rigorous supply chain traceability for crab, they would need to institute certain additional specific mechanisms. Thus, the first necessary undertaking was to review the Russian Federation's most recent MCS systems and trade controls, to determine the essential information currently collected and verified by the Russian government as well as the specific timing associated with collection and verification of each piece of information. Project partners leveraged this research to determine which specific pieces of information were the key data elements (KDEs) to gauge the compliance of the harvest and confirm the crab physically delivered was the same as what was harvested. Once these KDEs were identified, it was important to

associate them with critical junctures, known as critical tracking events (CTEs), along the flow of the product from harvest through import into the United States. These associations were laid out in a KDE/CTE map. With the map of KDEs and CTEs in hand, the project partners were able to indicate the essential documents and how they would be passed through the supply chain, and to establish verification protocols for corroborating each KDE.

To achieve supply chain traceability for Russian king crab imports into the US, project partners determined that a series of four mechanisms (labeled A-D below) should be implemented at precise locations and times along the supply chain. Carrying out these mechanisms necessitates good communication and collaboration between the US importing company and its suppliers. What follows are the specific mechanisms project partners envisioned as part of the traceability design and how each mechanism was achieved for the pilot phase by their temporal order of implementation (see Appendix 1 for these mechanisms listed by KDE, structured in a format to answer the following questions: Who?, What?, Where?, When?, and How?).



Empty pallet being lowered into the hold of a trawler vessel docked in the port of Busan to discharge crab caught in the far east waters of Russia.

MECHANISM (A) Onboard Scientific Observer and Verification of "How" KDE

LOCATION/TIMING:

Phase 1: Crab Fishing and Processing

Phase 2: At-Sea Transshipment and Export

As part of this pilot, WWF, Orca Bay, and Far Eastern Fisherman discussed the use of video cameras and onboard scientific observers on both harvest and transshipment vessels. Far Eastern Fisherman, according to company policy, began using video cameras on all their vessels several years prior, and was glad to make the video from these cameras available for further observation. WWF recognizes that video cameras could be a valuable tool for certain KDE verification, but also acknowledges that there are so many specific details that need to be studied that it would warrant a separate, stand-alone pilot project.⁵³

Far Eastern Fisherman also works with TINRO to allow scientific observers on board its vessels. No evidence was found to indicate that illicit gear usage was a risk issue in this fishery; however, for this pilot, a mechanism was still needed to capture the actual species harvested and the gear type used, and to verify crab processing measurements while the vessel was at sea, so as not to rely solely on self-reported information. WWF Russia's program coordinator for sustainable fisheries in the Kamchatka/Bering Sea region, Dr. Sergey Korostelev—the former head of the regional Kamchatka Fishery Institute (known as KamchatNIRO), which like TINRO is a subdivision of VNIRO (the Russian Federal Research Institute of Fisheries and Oceanography)—has experience as a scientific observer on fishing vessels in Russia. During the pilot, Dr. Korostelev acted as an onboard scientific observer on the fishing vessel during harvest, and on the transport vessel from the point of transshipment to the port of Vladivostok. As part of this project, Dr. Korostelev worked from agreed-upon terms of reference for TINRO and adhered to its scientific observer protocol. Additionally, Dr. Korostelev verified the fishing gear that was utilized is exactly the type and specifications authorized. Additional verification of the "how" KDE was gained by comparing the description of authorized fishing gear (listed on the Official FFA Specific Quota/Fishing Permit Certificate) with the description of the fishing gear used that is written on the daily fishing vessel report logbook. Additionally, Russian Coast Guard inspectors boarded the vessel at the time of transshipment and validated the gear type,

and corroborated both vessels' compliance with Russian fishery and transport regulations.

While this pilot utilized Dr. Korostelev's expertise to achieve several goals, project partners understand that an onboard scientific observer is not a repeatable or realistic measure to expect for implementing the traceability design beyond the scope of this pilot. Project partners are encouraged by the potential for onboard video cameras to play a more central role in achieving this mechanism and verifying the KDEs at this phase, but recognize the need for further specific research and pilot projects to test the use of video for KDE verification.



A view inside the hold of a trawler vessel docked in Busan with other elements of the Gamcheon port in the background.

MECHANISM (B) PART 1**Establishing “What” KDE—Species and Batch Tracking****LOCATION AND TIMING:****Phase 1: Crab Fishing and Processing**

Demonstrating a clear, direct link between the physical crab from harvest /processing, and the information about the harvest that transmitted along with the physical crab, is a critical part of full chain traceability.

After live crab is harvested, it is processed immediately on board the same vessel that caught it (depending on harvest volumes, live crab may stay in holds for up to 24 hours before processing). Batch tracking by the harvest permit number and specific processing/production date was established and remained attached to every box of processed crab (which became the foundational unit of crab sale after it had been harvested). Processed, boxed crab stays in the same form, in its original boxes from original processing procedures to import into the US. When unloading occurred in the US, Orca Bay validated that the harvest permit number sent by email from its supply chain partners matched the permit number labeled on the physical boxes it imported.

- During the pilot, the fishing vessel piloted the use of key data elements that were established by the time the crab was harvested and processed, which included the following:
 - > Fishing Vessel (F/V) Name (English)
 - > Fishing Vessel (F/V) IMO Number
 - > Fishing Vessel (F/V) MMSI Number
 - > Fishing Vessel (F/V) Call Sign
 - > Fishing Harvest Permit Number, a unique 12-digit numeric code administered by Russian Fishery Agency that only specific Russian companies and Russian government know and have access to (The Fishing Harvest Permit is administered to a specific company that has already been granted fishing quota for that specific species and details the company’s specific vessel that is permitted to fish within a specific window of time, lists a particular gear type, and names a maximum allowed weight of harvest during that time frame.)
 - > Production Date
 - > Russian Fishery Basin Code (61.XX.X)
 - > Species
 - > Product Type
 - > Crab Grade

- The harvest permit number and production/processing date together created the unique foundational link to track each batch of product, thereby establishing a direct link between the physical product and the data associated with it (product/data pairing).
- Other elements individually would not be enough to establish a unique link; however, since the foundational unit of batch tracking was determined by the harvest permit and processing date, the other data elements, taken together, created additional attributes to help differentiate and track the product.
- Far Eastern Fisherman added printers capable of producing Quick Response (QR) codes on each of its crab harvesting vessels. The labels that were placed on each box of crab produced now included a QR code with KDEs relevant to the harvest and processing of the contents of each box. An example of the box label with QR code and the QR code readout is indicated below:



Close-up of the labels affixed to boxes of crab with the added QR Code and an inset of the data contained within the code.

MECHANISM (B) PART 2**Verification of “What” KDE—Species****LOCATION AND TIMING:****Phase 3: South Korea**

US companies often contract with third-party seafood inspectors in Busan, South Korea, to check for phytosanitary issues such as listeria and other harmful pathogens and bacteria. Orca Bay is no exception. These third-party seafood inspections cover a number of safety and quality criteria, including conformance of the species reported. Inspectors are adept at distinguishing species differences when looking at frozen, processed king crab. As part of this pilot, Orca Bay required the independent seafood inspectors to include in the final inspection reports a short, specific, written attestation of which species were

found in all of the boxes that were inspected indicating confirmation of what species the harvesting company included on each box’s label.

Independent laboratory genetic testing offers an alternative mechanism for checking species conformance. This method was not feasible for the pilot, but the project partners acknowledge its utility as an alternative mechanism with a greater measure of objectivity.

MECHANISM (C)**Supply Chain Document Check—Verification of “Who” KDE****LOCATION AND TIMING:****Phase 3: South Korea**

Finalization of the purchase of the crab occurs while it is in cold storage in Busan, South Korea, and is dependent on the seafood inspection. Around the time that the independent seafood inspector was inspecting the crab, Orca Bay verified the Russian harvest company quota, as well as both the harvest and the transshipment vessels’ registration validity (in this case, fishing vessel Regul was registered to the Far Eastern Fisherman company Interrybflot, and transshipment vessel Kamchatskiy Proliv was registered to the Far Eastern Fisherman transport company Marine Transport).

Orca Bay sent WWF the official Russian Fishing Permit document, the EU Catch Certificate, and the TINRO-authorized frozen-to-live conversion factor as well as the following information in text form:

- a) Name of harvest company, tax ID number, and name of both harvest and transshipment vessels that Orca Bay’s supplier submitted to them as the quota holding entity under which the crab was lawfully harvested
- b) Species, harvest basin, and quantity of allowed crab harvest (as written on Fishing Permit)

WWF compiled data and used online public records issued by the Russian government to verify that the amount of frozen crab that Orca Bay hoped to purchase and planned to import was less than the maximum authorized amount that Far Eastern Fisherman could harvest and that both the fishing vessel Regul and the transshipment vessel Kamchatskiy Proliv were lawfully registered vessels.^{54, 55} Orca Bay then received information from WWF on the Russian fishing company’s official quota volume, as well as the registration validity of the harvest vessel and the transshipment vessel. Orca Bay was then able to utilize the TINRO-authorized

conversion factor for frozen-to-live crab in order to convert the total weight purchased/imported from its frozen weight to its live weight equivalent. This allowed Orca Bay to determine how much of the harvesting company’s quota it purchased, thus guaranteeing that the weight of purchased/imported crab was within the legal allowed total harvest quota granted by the Russian government to that specific company for a specific species, in a specific fishing zone. WWF’s role in this pilot for verifying the “Who” was simply to illustrate the mechanisms and bridge the language gap. WWF does not operate as an auditor or certifier in engagements with the private sector.

This allowed Orca Bay to take a critical risk mitigation step and avoid the pitfalls of what happened to Harbor Seafood, Inc., in the 2011 Lacey Act case *United States v. 112 Metric Tons of Frozen King Crab, No. 11-334 (W.D. Wa.)* (filed Feb. 24, 2011). Harbor Seafood, Inc., attempted to import Russian blue king crab that had been harvested by vessels that did not possess enough crab quota or that were not permitted to harvest crab in Russia.



An official observes the offload from the tramper vessel to give an independent count of the quantities to pertinent authorities.

MECHANISM (D)**AIS Data Check—Verification of “When” and “Where” KDEs****LOCATION AND TIMING****Phase 3: South Korea**

Orca Bay utilized required supply chain sourcing documentation to verify timing and location of fishing, transshipment, and port landings by utilizing both Global Fishing Watch’s open platform and by having WWF enter into a short-term agreement with Global Fishing Watch (GFW) to generate a short data validation report based on critical tracking event inputs (see Appendix 2 for both the required inputs and examples of the report). This mechanism utilized the fishing vessel details that were captured as a part of Mechanism B, Part 1 (Verification of “What” KDE). The fishing vessel details were combined with details about the transshipment vessel (vessel name, IMO number, and call sign, which are identified on the EU Catch Certificate) to verify and visualize the whereabouts of both the fishing vessel and the transshipment vessel for the duration of harvest, transshipment, and transport using the automatic identification system (AIS) signals generated from the respective vessels’ transponders.

GFW allows the public to visualize AIS signals from fishing vessels in near real time. Additionally, in 2017, GFW released a report and accompanying data set on potential and likely rendezvous locations indicating likely at-sea transshipment events.⁵⁶ The addition of the transshipment data set into the GFW online platform enabled new possibilities for companies and researchers alike. One such use perfectly fits the needs of companies looking to validate critical tracking events based on the paper sourcing documentation received from Russian seafood suppliers. Companies can validate that the specific harvest vessel fished during the permit-specified date range and in the permit-specified Russian fishing zone, as well as the date, time, and location of the at-sea transshipment event. Additionally, the company can validate that the transshipment vessel stopped in a Russian port to register with Customs on the specified date, as well as the date and location of the vessel’s foreign port landing to off-load the crab.

The following direct link to Global Fishing Watch has the Russian Far East fishing zone/basin layer pre-loaded, in addition to the two Far Eastern Fisherman vessels used during this pilot (fishing/processing vessel Regul and transshipment vessel Kamchatskiy Proliv). The user will need to set the correct time horizon: <http://globalfishingwatch.org/map/workspace/udw-v2-c6532d84-06f4-4040-ab33-8e0ff927c59a>.

It is important to note that this mechanism allowed Orca Bay to validate the specific timing and locations of the specific vessels indicated on supply chain documentation, but did not include checking each vessel’s full sailing track to check that unauthorized transshipment activities never took place beyond the specific timeline of the pilot project, or to validate that the vessel complied with other Russian rules and regulations relating to marine conservation areas (e.g., areas to be avoided, closed fishing grounds, or marine protected areas). However, the flexibility of the GFW platform allows for these validations to occur in the future, provided the user uploads additional GIS layers into the GFW platform that demarcate the area of inquiry.

MECHANISM (E) PART 3**Verification of “What” KDE: Batch Tracking****LOCATION AND TIMING****Phase 4: Seattle, US**

Orca Bay requested the cumulative daily fishing vessel report log for the crab in its purchase, and compared the total quantity of catch and transshipment to the bills of lading of the transport vessel and also to the cold storage tally report. Once the crab landed in Orca Bay’s facility outside of Seattle, Washington, US, a warehouse team member checked the harvest permit in labels imprinted on the boxes of crab to verify it matched the number listed in the documentation during Mechanism C. Orca Bay followed a sampling protocol for the pilot that consisted of checking the label on at least one box per pallet. Typically, 16 boxes constitute a full pallet. Assuming a full pallet of 16 boxes, this was a sampling rate of 6.25%. The project partners chose a sampling protocol to balance operation realities against the need to confirm that the physical receipts matched the reported purchase.

IV. Eye to the Future



WWF and Orca Bay aspired to design and test a proof-of-concept pilot project demonstrating supply chain traceability that would give Orca Bay assurance the physical product received was harvested legally by a Russian harvesting company and had not been fraudulently substituted in the journey.

WWF and Orca Bay created an auditable design for supply chain traceability of Russian crab, and were successfully able to implement all of the traceability design elements for the proof-of-concept pilot. In the future, Orca Bay may wish to seek external validation of this design by having it audited by a third party, to demonstrate impartial, qualified assurance of the robustness of these measures and to assure that the companies are adhering to these measures consistently.

WWF recognizes that as a proof-of-concept pilot, this stand-alone version of supply chain traceability was successful. When benchmarked against WWF’s Traceability Principles,⁵⁷ this proof-of-concept fares well against several of the principles, but there is still more work to be done. Fully addressing principle 4 (Digital Information and Standardized Data Formats) was infeasible during the pilot and most likely requires broader cooperation among commercial actors in this fishery and among US importers at a minimum. This is why Orca Bay is a member of the Global Dialogue on Seafood Traceability (<https://traceability-dialogue.org/>), an international, business-to-business platform established to advance a unified framework for interoperable seafood traceability practices. The nature of this fishery, product, and supply chain means there is little to no aggregation of lots, meaning that it was relatively simple to address principle 3 (Effective Tracking of Product Transformation). Augmentation of the pilot traceability mechanisms might be required if greater degrees of aggregation from multiple catch events occurred in other instances of sourcing Russian king crab. Finally, information is siloed between the various commercial and regulatory actors in the supply chain. While some channels for data sharing are established, a greater degree of transparency could better enable cross-checking compliance of Russian king crab toward meeting principle 6 (Transparency and Public Access to Information).

The Russian government has been moving ahead with several MCS systems and trade controls, as well as new labeling and traceability requirements, that appear to be addressing some of the original underlying IUU problems that the crab fishery faced in recent history.⁵⁸ Naturally, it is important that the Russian government continue to strengthen inter-governmental cooperation to eliminate trade in IUU seafood with all of its trade partners—and importantly, with the US. The US-Russia bilateral agreement to prevent IUU fishing and trade is the most recent of the bilateral agreements to be signed, and all project partners hope that the US will work together with Russia as a close partner. Commercial actors have a deep responsibility to reinforce the rule of law and to prevent the flow of IUU-derived products, but they equally depend on regulatory bodies to cooperate.

There is need for further refinement of the initial pilot tools such that they can be scaled, and for the creation of more targeted and easily usable verification tools.⁵⁹ There continues to be a greater need for digitization and standardization of data across all supply chain actors. With more industry partnerships and cooperation, it will be easier to achieve traceability and better verify responsible supply chains. If more major buyers and consumers demanded MSC certification, it would help incentivize this fishery’s quicker adoption of MSC certification, where the MSC CoC standard could be an additional layer of verifying middlemen trading partners for US companies.

Finally, while the aims of this project are specific to sourcing Russian-origin king crab, some of the information, KDEs, and verification mechanisms related to Russian TAC, quotas, and fisheries harvest permitting apply to other Russian fish and seafood species. All project partners hope that this project serves as just an initial template for similar practices and initiatives when sourcing other Russian-origin seafood.

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Endnotes

¹ Illegal, unreported, and unregulated (IUU) fishing is a term that categorizes behavior in relation to breaches of laws and regulations (that is, the differences between illegal, unreported, and unregulated). But by the time fish and seafood have reached consumer markets, it is often difficult to parse whether the nature of the illicit behavior was more “illegal” than “unreported,” and thus from the consumer market side, “IUU fishing” is commonly used. “Illegal” refers to fishing activities conducted in contravention of applicable laws and regulations, including those laws and rules adopted at the regional and international level, whereas “unreported” refers to “fishing activities that are not reported or are misreported to relevant authorities in contravention of national laws and regulations or reporting procedures of a relevant regional fisheries management organization (RFMO),” and “unregulated” refers to fishing that occurs in areas or for fish stocks for which there are no applicable conservation or management measures and where such fishing activities are conducted in a manner inconsistent with state responsibilities for the conservation of living marine resources under international law. See <https://www.iuufishing.noaa.gov/> for more information.

² <http://wwf.panda.org/?231010/Illegal-Russian-crab-entering-US-market> and http://assets.worldwildlife.org/publications/733/files/original/WWF_Illegal_crab_report_final_15_Oct_2014.pdf?1413407573.

³ 16 U.S.C. § 3372–3373.

⁴ Arnold & Porter, LLC, Advisory Briefing. August 2012, “Interpreting the Lacey Act’s ‘Due Care’ Standard after the Settlement of the Gibson Guitar Environmental Enforcement Case,” 3 pp. Available online at https://files.arnoldporter.com/advisory%20interpreting_the_lacey_acts_due_care_standard_after_settlement_gibson_guitar_environmental_enforcement_case.pdf

⁵ 16 U.S.C. § 3373 [footnote #5 within original publication].

⁶ Thomas Swegle, “The Lacey Act and Due Care,” Environment and Natural Resources Division, US Department of Justice, <http://www.worldwildlife.org/what/globalmarkets/forests/WWFBinaryitem24868.pdf> [footnote #6 within original publication; link broken as of 2018].

⁷ In re Hulbig, 7 O.R.W. 266 (NOAA July 16, 1993), citing *Newell v. Baldrige*, 548 F. Supp. 39 (W.D. Wash. 1982) (wildlife importer failed to satisfy due care requirement by not inquiring about legality of shipper’s operations); see also *In re Vo*, 2002 WL 31742934 (NOAA Oct. 22, 2002) (commercial fishers) [footnote #7 within original publication].

⁸ See WWF’s 2015 publication “Traceability Principles for Wild-caught Fish Products” (available online: <https://www.worldwildlife.org/publications/traceability-principles-for-wild-caught-fish-products>) for this definition of traceability, first suggested by P. Olsen and M. Borit in their 2013 article, “How to define traceability,” in *Trends in Food Science and Technology* (Vol. 29, Issue 2, pp. 142–150).

⁹ *Lithodes aequispinus* was formerly known in the US as brown king crab, but in 2017 Alaska Seafood Marketing Institute (ASMI) successfully lobbied to have the acceptable market name changed from “brown” to “golden.” For further information, see <https://keyportllc.com/fda-change-golden-king-crab/>, and the November 2017 FDA Guidance Briefing “Use of the Terms ‘Brown King Crab’ and ‘Golden King Crab’ in the Labeling of Human Food Products: Guidance for Industry”: <https://www.fda.gov/media/109182/download>.

¹⁰ The spelling of this crab in North America is often taken from its scientific name (“*Santolla*”), whereas in Chile, Argentina, and Peru, the crab name is spelled “*Centolla*.”

¹¹ See <https://www.usitc.gov/glossary/term/harmonized-tariff-schedule-united-states-hts> and <https://hts.usitc.gov/> for further information.

¹² “Under section 403(i)(1) of the Federal Food, Drug, and Cosmetic Act (the FD&C Act) (21 U.S.C. 343(i)(1)), a food is deemed misbranded unless its label bears ‘the common or usual name of the food, if any there be.’ FDA assists industry to determine the appropriate name for seafood by providing Guidance for Industry: The Seafood List—FDA’s Guide to Acceptable Market Names for

Seafood Sold in Interstate Commerce. The Seafood List is intended to provide guidance to industry about what FDA considers to be acceptable market names for seafood sold in interstate commerce and to assist manufacturers in labeling seafood products. In addition, our regulations, at 21 CFR 102.50, which predate the Seafood List, more specifically establish the common or usual name of crabmeat derived from several species of crabs” (pp. 3–4, <https://www.fda.gov/media/109182/download>).

¹³ The Seafood List: FDA’s Guide to Acceptable Market Names for Seafood Sold in Interstate Commerce. FDA Code of Federal Regulations. Acceptable market names for species within the *Paralithodes* genus: https://www.accessdata.fda.gov/scripts/fdcc/?set=seafoodlist&sort=SCIENTIFIC_NAME&order=ASC&startrow=1&type=basic&search=Paralithodes%20 and for *Lithodes aequispinus*: https://www.accessdata.fda.gov/scripts/fdcc/?set=seafoodlist&id=Lithodes_aequispinus&sort=SCIENTIFIC_NAME&order=ASC&startrow=1&type=basic&search=Lithodes.

¹⁴ The Seafood List: FDA’s Guide to Acceptable Market Names for Seafood Sold in Interstate Commerce. FDA Code of Federal Regulations. Acceptable market names for *Lithodes santolla*: https://www.accessdata.fda.gov/scripts/fdcc/?set=seafoodlist&id=Lithodes_santolla&sort=SCIENTIFIC_NAME&order=ASC&startrow=1&type=basic&search=Lithodes.

¹⁵ See pp. 496–499 of Chapter 15, “Red King Crab in the Barents Sea” by Jan H. Sundet, in *King Crabs of the World: Biology and Fisheries Management*, edited by Bradley G. Stevens, New York: CRC Press, 2014.

¹⁶ For more information, see UN FAO GLOBEFISH, 2017, Analysis and information on world fish trade (<http://www.fao.org/in-action/globefish/market-reports/resource-detail/en/c/522589/>) and Fox News, 2015, <http://www.foxnews.com/food-drink/2015/05/06/your-alaskan-king-crab-may-not-be-from-alaska.html>.

¹⁷ See National Marine Fisheries Service (NMFS) Annual Commercial Fisheries Statistics (<https://www.st.nmfs.noaa.gov/commercial-fisheries/index>) and Alaska Department of Fish & Game (ADF&G) Public News Bulletins for TAC and Guideline Harvest Level (<http://www.adfg.alaska.gov/index.cfm?adfg=cfnews.main>) for data on US commercial quota and harvest levels, by species

¹⁸ In 2017, for example, the US exported 3,225,971 lb of frozen king crab, whereas in the same year 25,227,970 lb of frozen king crab were imported by the US. Even subtracting the 567,821 lb of frozen crab re-exports, this leaves 24,660,149 lb of king crab imports, which represents more than seven times the volume of US harvest that was exported, and approximately double the US total harvest of king crab in 2017. Therefore, even if no US-harvested king crab was exported, domestic harvests alone would not fill US demand for king crab.

¹⁹ Russia forbids other countries (and all other non-Russian flagged vessels) from harvesting crab within its EEZ, so “Russian king crab” refers to one of five possible species of crab (in actuality, four possible species of king crab, as red *Santolla* king crab doesn’t inhabit Russian waters) that have been harvested under Russian Federation authority within its own waters.

²⁰ In order to compare Russian quota to US imports of king crab across all three king crab species, Russia’s live king crab quota was converted into its frozen weight equivalent using a broadly accepted average conversion ratio of 60%—that is, live king crab is assumed to lose 60% of its weight through the processing, cooking, and freezing process. Russian and US specialists both note that there are conversion ratios specific to fishing basin, species, etc.; however, on average across the entire king crab industry, the average conversion ratio of 60% is widely accepted and utilized.

²¹ For discussion of why foreign country import data are preferred to Russian export data and why Russian export data are not sufficient for country-volume trade comparisons, see WWF’s 2014 report “Illegal Russian Crab: An Investigation of Trade Flow” (<http://wwf.panda.org/?231010/Illegal-Russian-crab-entering-US-market>).

²² The large increases in Russian red king crab total allowable catch and quota, and hence harvest volume, over the past couple years are generally understood to be going to live crab markets in Asia.

- ²³ For details on the US-Russia bilateral agreement to prevent IUU signed in 2015, see <https://www.ecolex.org/details/treaty/agreement-between-the-government-of-the-united-states-of-america-and-the-government-of-the-russian-federation-on-cooperation-for-the-purposes-of-preventing-deterring-and-eliminating-illegal-unreported-and-unregulated-fishing-tre-160051/> and <https://2009-2017.state.gov/documents/organization/250927.pdf>.
- ²⁴ See 2014 WWF report, “Illegal Russian Crab: An Investigation of Trade Flow,” under section “Partner Country Trade Information and IUU Bilateral Initiatives,” beginning on p. 14, for further detail on each of the bilateral initiatives: <http://wwf.panda.org/?231010/Illegal-Russian-crab-entering-US-market> and http://assets.worldwildlife.org/publications/733/files/original/WWF_Illegal_crab_report_final_15_Oct_2014.pdf?1413407573.
- ²⁵ For further information about the coordination of Russian enforcement agencies to not only detect and catch vessels but also perform joint investigative operations, see the following news article: Primamedia.ru, January 30, 2019, “Yuri Ladigin, head of Russian Far East Customs Administration: You will hear more about crab smuggling in the Russian Far East,” <https://primamedia.ru/news/782546/>.
- ²⁶ See Russian Federation Customs, January 17, 2019, “Far Eastern Customs officers uncovered large live crab smuggling,” http://customs.ru/index.php?option=com_content&view=article&id=27126:2019-01-17-10-40-11&catid=40:2011-01-24-15-02-45; see also Primamedia.ru, 18 January 2019, “Customs officers and the FSB found 51 tons of live crab being smuggled to the PRC,” <https://primamedia.ru/news/778981/?from=37>.
- ²⁷ See Primamedia.ru, March 1, 2019, “Japanese Crabber arrested in Primorye and released on 39 million ruble bail,” <https://primamedia.ru/news/791403/>; see also JapanTimes.co.jp, March 3, 2019, “Fishing boat crew returns home to Tottori Prefecture after being released by Russia,” <https://www.japantimes.co.jp/news/2019/03/03/national/fishing-boat-crew-returns-home-tottori-prefecture-released-russia/>.
- ²⁸ Russian Federation, Border Guard of the Federal Security Service of Russia in the Eastern Arctic Region, February 2017 press release (in Russian), <http://www.svrpu.ru/officialnoe/press/2017/2.shtml>.
- ²⁹ Interfax News Agency, January 13, 2017, “A Tanzanian-flagged vessel caught poaching in the Sea of Okhotsk has been detained” (in Russian), <https://www.interfax.ru/russia/545239>.
- ³⁰ Russian Federation, Border Guard of the Federal Security Service of Russia in the Eastern Arctic Region, September 2016 press release (in Russian): <http://www.svrpu.ru/officialnoe/press/2016/9.shtml>.
- ³¹ See Primamedia, March 21, 2014, “Electronic Certification will beat IUU Fishing in the Far East” (in Russian), <https://primamedia.ru/news/344382/>; see also VladNews, March 18, 2014, “Ministry of Agriculture calls for all to fight IUU,” https://vladnews.ru/2014-03-18/60583/minselhoz_prizyvaet.
- ³² http://www.fao.org/fileadmin/user_upload/legal/docs/037s-e.pdf
- ³³ See Russia’s Federal Fishery Agency (FFA) press release from the March 27, 2019, UN PSMA meeting, <http://fish.gov.ru/press-tsentr/novosti/26592-naploshchadke-fao-obsudili-osobennosti-soglasheniya-o-merakh-gosudarstva-porta>.
- ³⁴ For further information on MCS systems in fisheries more broadly, see Flewwelling, P., “An introduction to monitoring, control and surveillance for capture fisheries,” FAO Fisheries Technical Paper No. 338, Rome: FAO, 1995, 217 pp., <http://www.fao.org/docrep/003/v4250e/v4250e00.htm#toc>.
- ³⁵ For further information in English, see <http://www.russianpollock.com/management/control-and-enforcement/>.
- ³⁶ See the charter for the “Center for Fishery Monitoring and Communications (CFMC)” for a full description of its duties: <http://cfmc.ru/about/ustav/>.
- ³⁷ See Russian Federation Decree 152 from April 19, 2016 (Министерство Сельского Хозяйства Российской Федерации Приказ от 19 Апреля 2016 Г. N 152 - О внесении изменений в Правила Рыболовства для Дальневосточного Рыбохозяйственного Бассейна): <http://www.consultant.ru/cons/cgi/online.cgi?req=doc&base=LAW&n=197860&fld=134&dst=100000001,0&rnd=0.8662467741027874#0906189893847532>.

- ³⁸ The requirement to have all logistics, processing, and transport vessels also be Russian-flagged has been at the center of much debate in Russia lately. Fish harvesting continues to increase in Russia, though investments into additional processing capacity and transportation vessels have lagged. Some companies have found themselves in a difficult situation when, during the height of fishing season, there is an insufficient number of Russian-flagged vessels to process and transport all the harvested fish. Thus, this requirement has led to instances where companies contract with foreign transport vessels in violation of Russian law; see, for example, the recent case of two Russian companies fined 38 million rubles (US\$586,218; <https://primamedia.ru/news/782830/>) for the use of foreign-flagged vessels to transport fish. These concerns have been paramount in what has been a very contentious reorganization of crab fishing quota allocations to companies beginning in 2019, reserving some portion of new quota shares for companies that invest in fish processing infrastructure and transport vessel construction. See <https://www.mk.ru/economics/2019/03/15/aukciony-pogubiyat-kraba.html> for more information on the debate of the new 2019 auction mechanism for administering crab quota to companies.
- ³⁹ See <https://fisheries.msc.org/en/fisheries/russia-barents-sea-red-king-crab/> for assessment documentation; see the MSC Supplier Search for *Paralithodes camtschaticus* (<http://cert.msc.org/supplierdirectory/VController.aspx?Path=be2ac378-2a36-484c-8016-383699e2e466&xf=1&SpeciesL=Paralithodes%20camtschaticus>) to identify specific companies that hold MSC Chain of Custody certification for red king crab.
- ⁴⁰ <http://crab-dv.ru/en/fip-russian-crab/fip-russian-crab.html>.
- ⁴¹ <https://casetext.com/case/us-v-144774-pounds-of-blue-king-crab>.
- ⁴² http://www.gc.noaa.gov/documents/2012/2012_D.Ct._King_Crab_Consent_Judgment_of_Forfeiture_ocr.pdf.
- ⁴³ Arnold & Porter, LLC, Advisory Briefing, August 2012, “Interpreting the Lacey Act’s ‘Due Care’ Standard after the Settlement of the Gibson Guitar Environmental Enforcement Case,” 3 pp., https://files.arnoldporter.com/advisory%20interpreting_the_lacey_acts_due_care_standard_after_settlement_gibson_guitar_environmental_enforcement_case.pdf.
- ⁴⁴ https://www.gibsondunn.com/wp-content/uploads/documents/publications/GibsonGuitarCorp_NPA.pdf
- ⁴⁵ <https://www.justice.gov/opa/pr/lumber-liquidators-inc-sentenced-illegal-importation-hardwood-and-related-environmental>.
- ⁴⁶ Lumber Liquidators Compliance Plan: https://www.sec.gov/Archives/edgar/data/1396033/000114420415058462/v421764_ex10-1.htm; also see Young Living Essential Oils Compliance Plan (p. 19): https://cdn.ymaws.com/www.iwpawood.org/resource/resmgr/files/young_living_essential_oils_.PDF, and subsequent Arnold & Porter, LLP, webinar: <https://vimeo.com/250637186>, and the International Wood Products Association (IWPA) website for additional Lacey Act compliance plans and resources: <http://www.iwpawood.org/?page=CourseResources>.
- ⁴⁷ Suggested due care compliance plan structure is based on course materials from “Wood Trade Compliance Training and Due Diligence Tools: Participant Guide” conducted by the International Wood Products Association (IWPA). Document Version 2.6, dated 10/14/2016, p. 9. See course website for more information: <http://www.iwpawood.org/page/DueDiligenceTrain>.
- ⁴⁸ It is possible for documents presented by middleman companies to their foreign customers about the origin of the Russian crab to have nothing to do with the actual supply chain, or they may be reused from other transactions with other companies (e.g., reusing legal harvest permits and other supply chain documents that are not connected to the actual crab being traded). Suppliers may assume that providing any official-looking documents will be sufficient to satisfy their customers’ needs. This is why gathering information and documents from suppliers is not sufficient action to demonstrate due care. The documents and information must be assessed for risk.
- ⁴⁹ As previously mentioned, in literature regarding the industry, the general conversion ratio assumes that frozen king crab weight is, on average, 60% of the live weight; however, for specific shipments, companies are encouraged to work with their supplier to determine an accurate conversion ratio that reflects the specific species and the area where it was harvested.

- ⁵⁰ See <http://www.tinro-center.ru/uslugi-i-produkcia/podderzka-promysla> and <https://fishnews.ru/news/35661> for additional information.
- ⁵¹ See <https://fishnews.ru/news/36313> for more information on Russian Coast Guard and FSB checkpoints.
- ⁵² Far Eastern Fisherman is the parent company to several smaller companies all involved in various aspects of fishing/seafood harvesting, transshipping via refrigerated transportation vessels, and foreign product marketing, sales, and logistics. For this pilot project, WWF and Orca Bay worked closely with the following Far Eastern Fisherman companies: crab harvesting companies Interybflot (Интеррыбфлот) and Polaris (Поларис), transport vessel company Marine Transport (Морской транспорт), and foreign product marketing, sales, and logistics company TB Trade Co., based in Tokyo, Japan.
- ⁵³ Determining the effectiveness of video cameras to verify specific KDEs would require studying many additional issues, such as positions of the cameras, camera resolution, what information/images are gathered that can also be analyzed, timing of video analysis, methodology of analysis, and who should conduct the analysis. The following is an example of the research required: https://www.researchgate.net/publication/273317118_Video_capture_of_crustacean_fisheries_data_as_an_alternative_to_on-board_observers. Hold, N., Murray, L., Pantin, J. R., Haig, J., Kaiser, M. (2015), Video capture of crustacean fisheries data as an alternative to on-board observers, ICES Journal of Marine Science, 72, 10.1093/icesjms/fsvo30.
- ⁵⁴ All commercial quotas for all fish species in Russia, not just crab, are administered through Russia’s Federal Fishing Agency (FFA) [Министерство Сельского Хозяйства Российской Федерации - Федеральное Агентство по Рыболовству (РОСРЫБОЛОВСТВО)]. All documents and online fishing regulations are publicly available online through the Russian Government’s legal-normative acts database (<http://npb.fishcom.ru/>) and through Russian third-party legal databases (like ConsultantPlus, <https://www.consultant.ru/online/>). The three main types of decrees/acts relevant for validating crab quotas are the following: a) quota share (percent) of overall harvesting rights by species and fishing zone (this share is multiplied by each year’s TAC to determine specific quota volumes for each company) [доли квот вылова (добычи) водных биологических ресурсов]; b) yearly TAC, which

are not company specific, but are specific to species and fishing zone [общие допустимые уловы водных биологических ресурсов]; and c) yearly harvesting quota received by specific companies for specific species in specific fishing zones (квоты вылова (добычи) водных биологических ресурсов).

- ⁵⁵ The Russian Federation’s Maritime Register is a federal authority under the Department of Transportation and maintains a database that can be used to validate Russian fishing and transshipment vessels—the Russian Maritime Register of Shipping (<https://rs-class.org/en/>). Since the EU Catch Certificate first became mandatory for seafood imports into the EU in 2010, one might hope that if an EU Catch Certificate had been issued for this shipment by Russian authorities in 2011, it might have been caught by Russian authorities (even though it was not mandatory since the shipment was destined for the US). However, it is unknown whether an EU Catch Certificate was issued and, if it was, whether it should have been detected by Russian authorities. See <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:286:0001:0032:EN:PDF> for the EU Catch Certificate regulation adopted by the European Commission in 2008; and see <https://www.megafishnet.com/news/15434.html> for more information on Russia’s 2010 compliance with EU Catch Certificate rules.
- ⁵⁶ See <https://globalfishingwatch.org/transshipment-success/> for more information.
- ⁵⁷ See WWF’s 2015 publication “Traceability Principles for Wild-caught Fish Products.” Available online: <https://www.worldwildlife.org/publications/traceability-principles-for-wild-caught-fish-products>.
- ⁵⁸ For example, Russia passed Decree No. 515 on April 26, 2019, adopting new procedures and regulations to further advance commodity labeling and traceability. See http://fishkamchatka.ru/articles/russia/29410/?fbclid=IwARouKEXUa_3LGoDxrCFYC6VwyjE8umpRtgAgJL7GGosrEp4m7SIDXcphkQ and <http://government.ru/docs/36568/> for additional information.
- ⁵⁹ For example, there is ongoing research and development of provenance technologies (from genetics to biochemical analysis) to validate specific species and verify origin of seafood.



Appendix 1

Summary of Traceability Pilot Mechanisms, by Key Data Element (KDE)

KDE	Question and Description	Location & Mechanism During Pilot
"WHO" KDE	<p>Which fishing vessel harvested this crab, and did it have authorization to do so?</p> <p>The fishing harvest permit is to be checked against Russia's Federal Fishery Agency data to ensure the US company confirms the Russian company has authorized fishing quota.</p> <p>The fishing and transshipment vessels' authorization are to be verified.</p>	PHASE 3: SOUTH KOREA MECHANISM (C): SUPPLY CHAIN DOCUMENT CHECK
"WHAT" KDE	<p>Are the species and quantity of crab harvested valid, and was the crab authorized to be taken?</p> <p>The third-party seafood inspector attests to the species it identifies when it inspects the seafood in cold storage and compares it for conformity with the labeled species on the boxes of crab.</p> <p>The quantity taken must conform across the captain's 24-hour catch logs, trumper B/Ls, and cold storage input records.</p>	PHASES 1, 3 & 4: RUSSIA, SOUTH KOREA & US MECHANISM (B) PARTS 1-3: BATCH TRACKING & VERIFICATION
"WHERE" KDE	<p>Did the fishing vessel harvest crab in the area reported, and was it authorized to do so? Did transshipment to the transport vessel occur where reported?</p> <p>Utilize a public AIS service like Global Fishing Watch to validate that the fishing vessel was in the fishing zone that it reported on the preliminary EU Catch Certificate and that zone is what was authorized on the fishing ticket/permit.</p> <p>Utilize the AIS service to validate the location of the rendezvous between the transshipment vessel and fishing vessel as reported.</p>	PHASE 3: SOUTH KOREA MECHANISM (D): AIS DATA CHECK
"WHEN" KDE	<p>Did fishing occur when reported, and was it authorized to do so? Did transshipment to the transport vessel occur when it was reported?</p> <p>Utilize a public AIS service like Global Fishing Watch to validate that the timing of the fishing vessel in the fishing zone aligns with what is reported on the EU Catch Certificate and that the timing is in line with what was authorized on the fishing ticket/permit.</p> <p>Utilize the AIS service to validate the location of the rendezvous between the Trumper vessel and fishing vessel as reported. Global Fishing Watch would allow validation that no transshipment anomalies occurred between Vladivostok and Busan.</p>	PHASE 3: SOUTH KOREA MECHANISM (D): AIS DATA CHECK
"HOW" KDE	<p>Was the fishing gear utilized what was officially authorized?</p> <p>Onboard scientific observer verifies the fishing gear utilized is the type authorized. The fishing vessels have cameras on board that can be reviewed to check the gear type.</p> <p>Also, a description of the fishing gear authorized for use is listed on the fishing permit and on the 24-hour captain's log. Conformity between these documents should be confirmed. A Coast Guard inspector also validates the gear used when onboard the fishing vessel prior to transshipment.</p>	PHASE 3: RUSSIA MECHANISM (A): ONBOARD OBSERVER

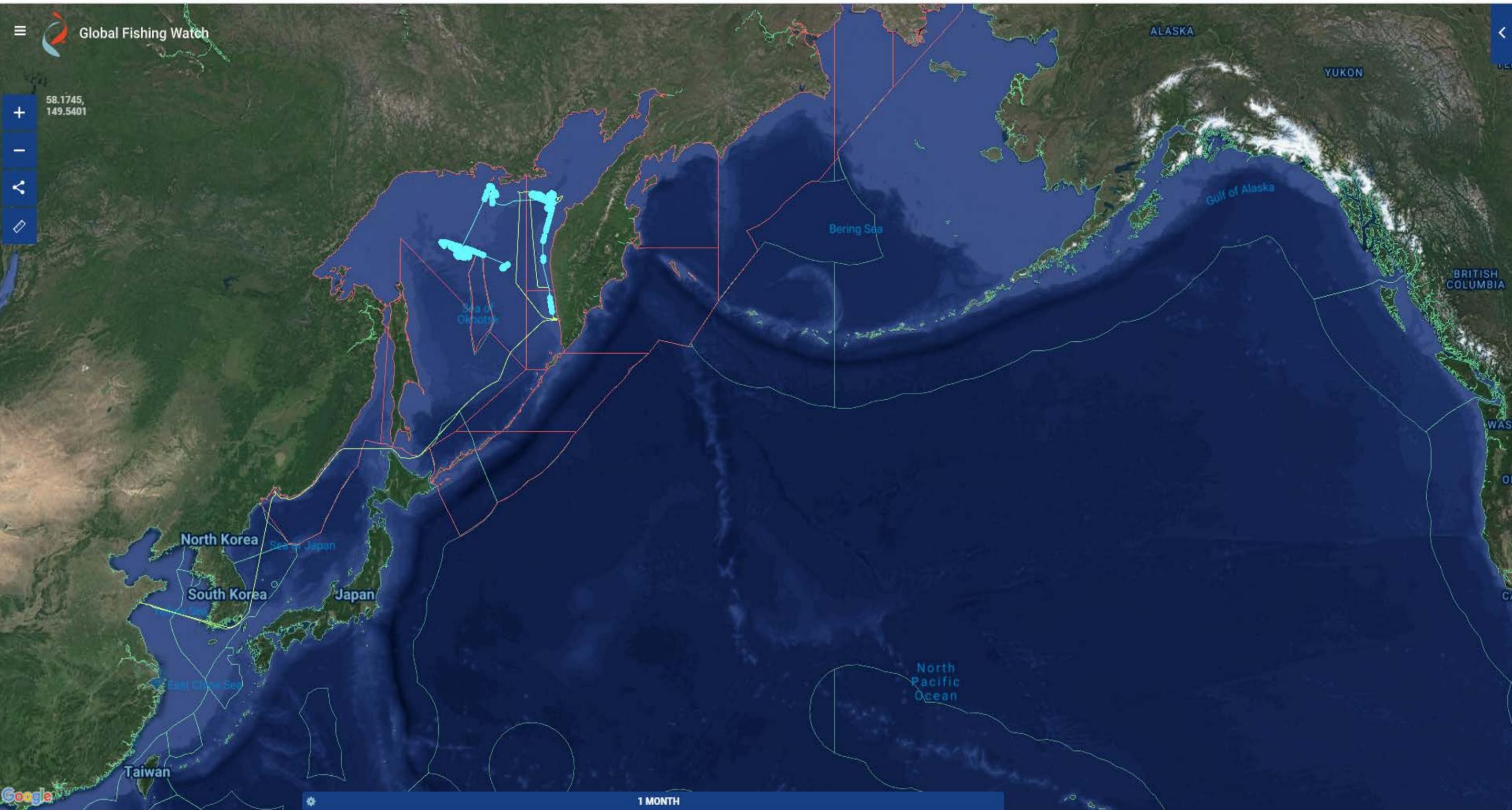
Appendix 2

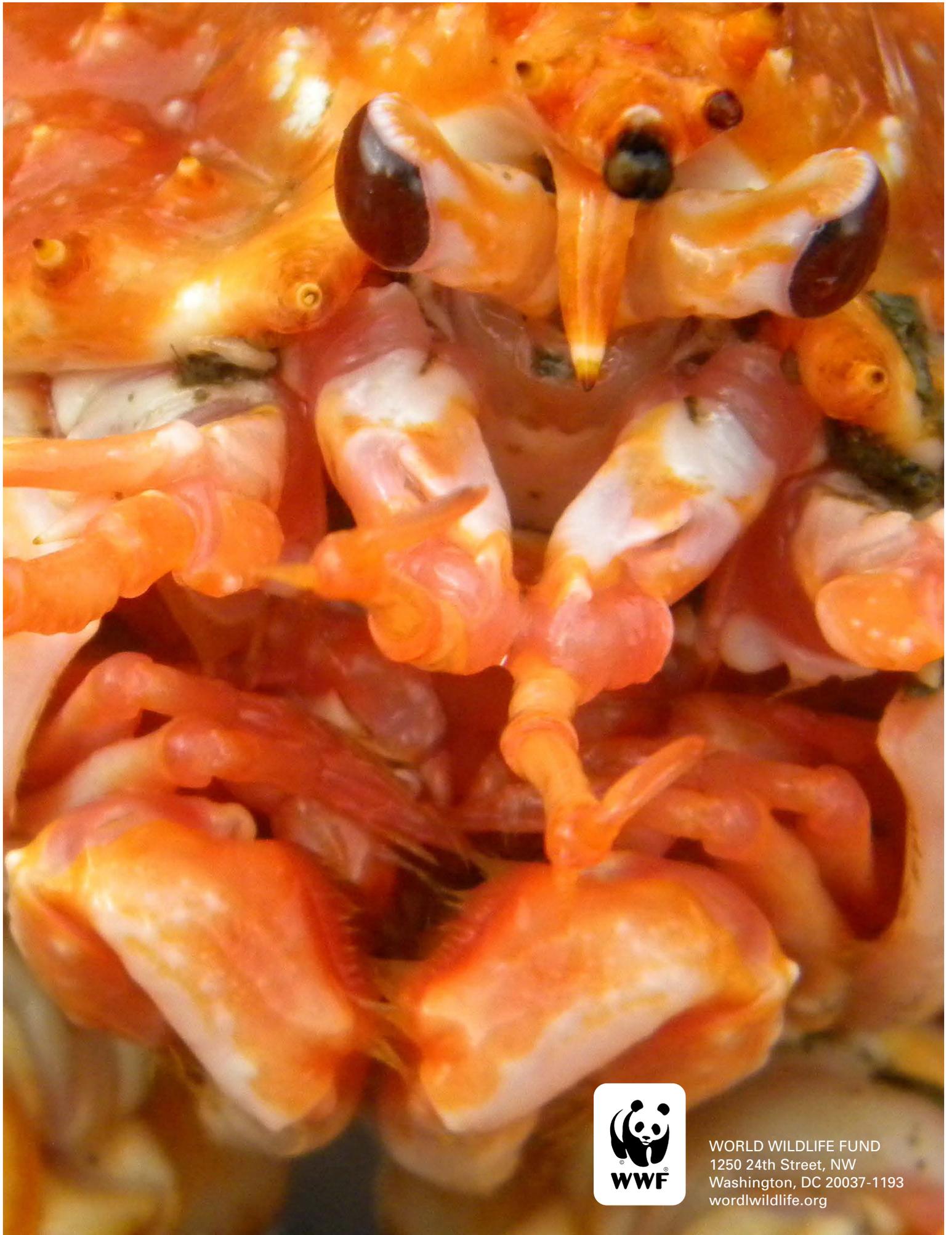
Description of Inputs and Outputs for AIS Verification Using Global Fishing Watch

The following table highlights the 15 inputs that the Company provided to WWF and Global Fishing Watch (GFW), as well as the corresponding description of outputs that GFW provided in response, as per WWF-GFW Memorandum Of Understanding (MOU) specific to this project:

Description of Inputs	Pilot	Location & Mechanism During Pilot
1) Fishing Vessel (F/V) Name (English) from EU Catch Certificate	<i>Regul</i>	Y/N—Was F/V in the "Location of Catch" during the catch dates reported?
2) Fishing Vessel (F/V) IMO Number from EU Catch Certificate	8727733	
3) Fishing Vessel (F/V) Call Sign from EU Catch Certificate	UDKH	Detail any additional transshipment meet-ups of the F/V within a date window occurring five days before and after catch dates.
4) Location of Catch (Russian Fishing Zone Code) (61.XX.X) from EU Catch Certificate	61.05.2	
5) Actual Catch Date Start (DD.MM.YYYY) from EU Catch Certificate	07.01.2018	Map screenshot of F/V AIS signal during reported catch dates.
6) Actual Catch Date End (DD.MM.YYYY) from EU Catch Certificate	17.01.2018	Y/N—Was F/V transmitting continuously (≤ every two hours) during catch dates?
7) Transshipment Vessel (T/V) Name (English) from EU Catch Certificate	<i>Kamchatskiy Proliv</i>	Y/N - Did the F/V and T/V meet at the location and time described?
8) Transshipment Vessel (T/V) IMO Number from EU Catch Certificate	9061899	
9) Transshipment Vessel (T/V) Call Sign from EU Catch Certificate	UARD	Map screenshot of F/V and T/V AIS signals 24 hours before and after meet-up.
10) Date of Transshipment (from F/V to T/V) from EU Catch Certificate	17.01.2018	
11) Lat./Long. Coordinates of Transshipment, DMS (degrees, minutes, seconds) or DD (decimal degrees) from EU Catch Certificate	DMS = 58°26'2"N, 153° 51'0" E DD = 58.43388, 153.85000	Y/N—Was Vladivostok the first port called by T/V after transshipment?
12) Russian Port (first stop after transshipment) from EU Catch Certificate	Vladivostok, Russia	
13) Russian Port Departure Date (from Korean Import "Bonded" Vessel Manifest) (YYYY.MM.DD)	Russian Export Declaration filed = 2018.01.31; this is likely within +/-3 days of when T/V left Vladivostok, Russia	Y/N—Did T/V have other meet-ups between Vladivostok port call and F/V meet-up? Please detail vessels, location, and timing if so.
14) Foreign Port (after stop-off in Russian port)*	Qingdao, China—and then on to Gamchun/Kamchun (KRKCN), Busan, South Korea	
15) Foreign Port Arrival Date (from Korean Import "Bonded" Vessel Manifest) (YYYY.MM.DD)	Busan, Korea arrival = 2018.02.15	Y/N—Did T/V have meet-ups between Vladivostok and Busan port call? Please detail vessels, location, and timing if so.
*Company was told that the T/V sailed from Vladivostok, Russia, to Qingdao, China, to unload other cargo and then went on to Busan, South Korea, where it unloaded the specific crab for this pilot.		Map of T/V AIS signals from before F/V meet-up through to Busan port call.

See the following link to access Global Fishing Watch's map pre-loaded with the Russian Far East fishing zone/basin layer in addition to the two Far Eastern Fisherman vessels used during this pilot (fishing/processing vessel *Regul* and transshipment vessel *Kamchatskiy Proliv*). The user will need to set the correct time horizon: <http://globalfishingwatch.org/map/workspace/udw-v2-c6532d84-06f4-4040-ab33-8e0ff927c59a>.





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