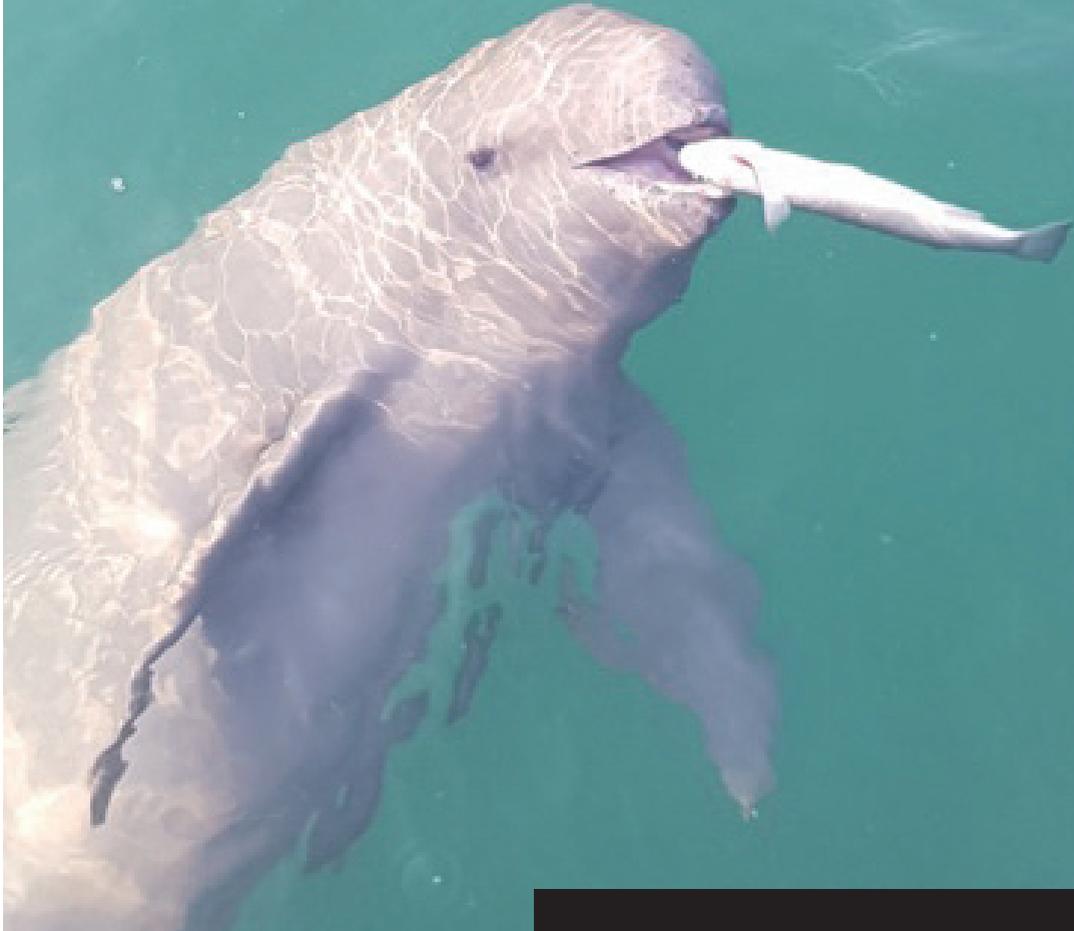




KOREA



THE YELLOW SEA'S NARROW-RIDGED FINLESS PORPOISE

WWF

(World Wide Fund for Nature)

WWF is one of the world's largest and most experienced independent conservation organizations, with over 5 million supporters and a global network active in more than 100 countries. WWF's mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature, by conserving the world's biological diversity, ensuring that the use of renewable natural resources is sustainable, and promoting the reduction of pollution and wasteful consumption.

Publication details

WWF-Korea, Oceans Team
(ylee@wwfkorea.or.kr)

Publisher: Yoonhee Hong

WWF-Korea, Seoul, South Korea

Creators: Youngran Lee & Hyeonji

Kim, WWF-Korea, Seoul, Chung

Wing Yeung, WWF-China Beijing

Advisor: Cetacean Research

Institute

Date of Publication: March 2021

Design: Bestseller Banana

Cover photo: © Alphaturus Co

Recommended Citation:

WWF-Korea 2021. The Yellow Sea Narrow-Ridged Finless Porpoise. Kim, HJ., Lee, YR., Yeung, CW., WWF-Korea, Seoul, Republic of Korea

Notice for text and graphics:

©2021 WWF-Korea
All rights reserved

Any reproduction in full or in part must mention the title and credit the above-mentioned publisher as the copyright owner.

© Text 2021 WWF-Korea
All rights reserved



© Ministry of Oceans and Fisheries

CONTENT

TERMS	02
EXECUTIVE SUMMARY	03
NARROW-RIDGED FINLESS PORPOISE AT A GLANCE	04
CHAPTER 1: INTRODUCTION	08
NARROW-RIDGED FINLESS PORPOISE	11
GEOGRAPHIC SCOPE: YELLOW SEA	14
CHAPTER 2: CONSERVATION STATUS	16
REPUBLIC OF KOREA	18
CHINA	31
CHAPTER 3: CONCLUSION & RECOMMENDATION	32
REFERENCES	36

TERMS



ACMME: Act on Conservation and Management of Marine Ecosystem

CRI: Cetacean Research Institute

CRMCN: Cetacean Resource Management and Conservation Notice



CSO: Civil Society Organization

EAFP: East Asian Finless Porpoise

FA: Fisheries Act



IUCN: International Union for Conservation of Nature

NIFS: National Institute of Fisheries Science

NRFP: Narrow-ridged finless porpoise

MOF: Ministry of Oceans and Fisheries



ROK: Republic of Korea

WCC: World Conservation Congress

EXECUTIVE SUMMARY

Last year, a call for action to conserve the endangered narrow-ridged finless porpoise was made through International Union for Conservation of Nature (IUCN)-World Conservation Congress (WCC)-Motion 110. The motion titled “Safeguarding the narrow-ridged finless porpoise (*Neophocaena asiaorientalis*) in the Yellow Sea” recognizes the severe circumstance that the species faces and calls for actions by bordering countries of the Yellow Sea to work together and conserve the species. This motion with the 90% voting approval by IUCN members became an official resolution bringing legitimacy to the call for collaboration among Yellow Sea countries for species conservation.

As a first step to fulfill the resolution, on November 25th, 2020, WWF-Korea with the Ministry of Oceans and Fisheries, through funding from the Marine Mammal Commission, co-hosted the ‘Yellow Sea NRFP Conservation Status and a Way Forward’¹. The conference was participated by a wide range of stakeholders, including the International Whaling Commission(IWC), International Union for Conservation of Nature(IUCN), National Oceanic Atmospheric Administration(NOAA), Ministry of Oceans and Fisheries(MOF, ROK), Chelonia

Limited (acoustic monitoring device firm), Cetacean Research Institute (CRI, ROK) and other civil society organizations. The conference participants acknowledged that the species is understudied and more research needs to be done to properly figure the severity of the situation and effectively conserve the species.

To address such acknowledgments, this report, for the first time, consolidates existing policies and activities from China and ROK in regards to the species. The report suggests the Yellow Sea countries’ stakeholders to form a network and collaborate to conduct primary research and to advocate for policies and actions from the government. The report aims to act as a basis for further conservation activities to take among the countries. Lastly, the authors of this report hope that this report can serve to expedite your affection for the species and have you join the journey in conserving it, as it is also very much of your own public good as well.

1. The conference was conducted virtually due to COVID-19.



‘The Yellow Sea NRFP Conservation Status & a Way Forward’ virtual conference

NARROW-RIDGED FINLESS PORPOISE AT A GLANCE

NARROW-RIDGED FINLESS PORPOISE

Binomial Name:

Neophocaena asiaeorientalis

Conservation Status:

Endangered (EN) (IUCN, 2017)

Habitat:

Coasts of the Yellow Sea with preference for shallow waters with sandy bottom.

(Jefferson & Huang, 2004)

Physical Trait:

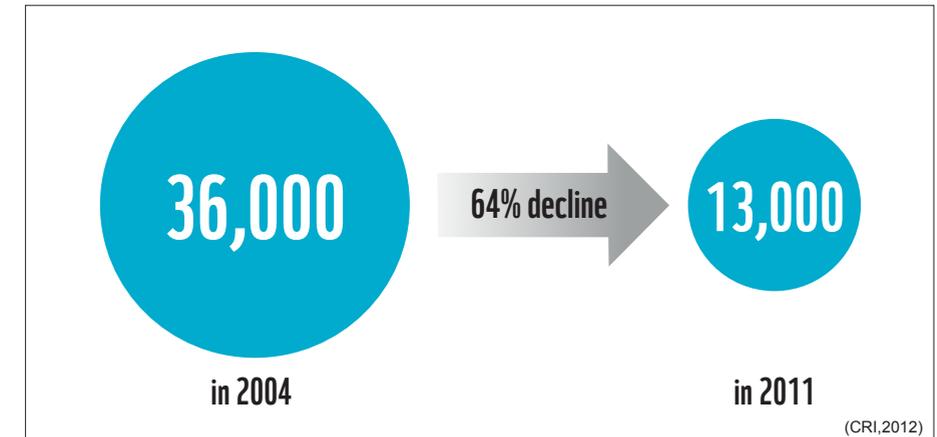
As the name implies, it lacks dorsal fin and can grow up to 1.5-1.9m.

Due to its round amiable face, it is often called a 'smiling porpoise'.

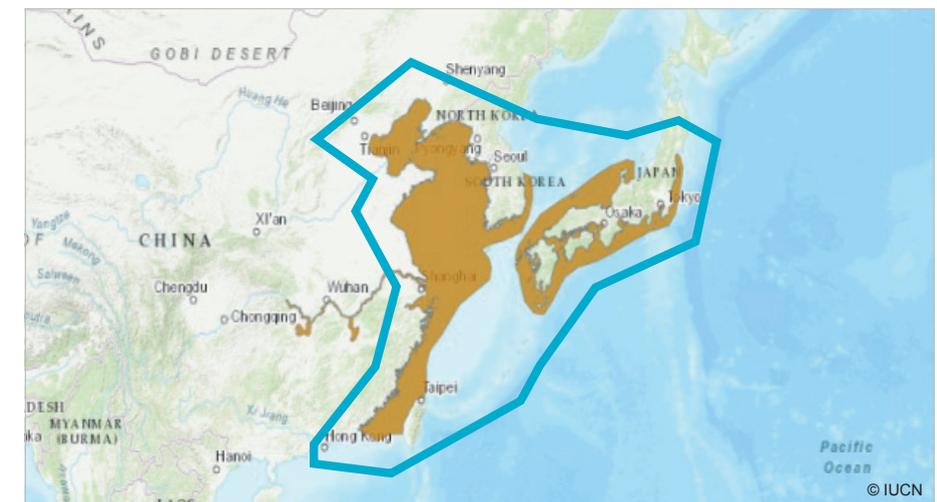
Major Threat:

Bycatch

SOUTH KOREA POPULATION TREND



NARROW-RIDGED FINLESS PORPOISE COASTAL HABITAT RANGE



RECOMMENDED ACTIONS FOR NRFP CONSERVATION

1) SCIENTIFIC SURVEY ON THE CURRENT STATUS

FIGURING WHERE WE STAND WITH THE SPECIES

1. Knowledge sharing platform
What do we know and what do others know regarding the species?
2. Population trend survey
Is the population declining at places of its known habitat range?
3. Hot-spot survey
Are there certain geographic spots where the species favor that are currently unknown?
4. Bycatch survey
On what fisheries do the species get bycaught and at what seasons?
5. Migration/movement survey
Does the species cross borders?

2) SCIENCE-BASED CONSERVATION PLAN

BUILDING COLLABORATIVE AND EFFECTIVE CONSERVATION PLAN

1. Corridor protection
If the species cross borders, what can range countries do to protect its migration route?
2. Market incentive: NRFP friendly seafood branding; skipper awareness raising sessions
How do we get fisheries to implement bycatch mitigation measures?
3. Establishment of a platform for cross country and multi-stakeholder knowledge sharing and collaboration
Have other countries or certain organizations conducted conservation measures that we have not conducted yet?
4. Campaigns by CSOs and citizen science
How do we raise public awareness regarding the species and engage with the public throughout the conservation process?



CHAPTER 1: INTRODUCTION

© Tom Vierus/ WWF-US

Continuous human civilization, while bringing comfort to us, has brought forth numerous unforeseen challenges. Since human civilization, 75% of the Earth's ice-free land surface has been altered, 85% of the area of the wetland has been lost and most of the oceans are polluted (WWF,2020). What once was storage for CO2 and home for wildlife are being negatively impacted by anthropogenic factors. In consequence, we face climate change and a dramatic decrease in biodiversity. These two factors are inevitably interlinked, meaning that the acceleration of biodiversity loss can further intensify climate change and vice versa. Therefore, for a sustainable future, we must place equal gravity on climate change and loss of biodiversity and tackle drivers accelerating the two phenomena.

Since the late 19th century, the planet's average surface temperature has risen about 0.9 degrees Celsius (NASA)¹. In consequence of the rising temperature, the oceans, in particular, have taken up 93 percent of the extra energy that has been accumulated in the Earth system (Borunda, 2019). This has led to a rise in the ocean level, acidification, coral bleaching, and degradation of marine biodiversity. Of the total marine mammals, 40 percent are considered to be at the risk of extinction (Davidson, Ana D., et al., 2012).

Commercial fishing activity further accelerates this menacing trend. It is suspected that over 300,000 marine mammals are killed, annually, due to entanglement in fishing gears: bycatch (WWF, 2020). This is an urgent and grave issue,

as marine mammals reproduce slowly, mortality exceeding natural death poses a great threat. This is also a threat to the whole marine ecosystem, as they are located at the most trophic level, playing an important role in nutrient cycling.

Of marine mammals, small cetaceans² face a particular threat. Not only are they vulnerable to bycatch like all other marine mammals, but they also suffer from data deficiency. Of all small cetacean species, 58 percent are classified by the IUCN as data deficient, while only 27 percent of whales are listed as data deficient (Elliot et al., 2009). Furthermore, all small cetaceans with sufficient information on the IUCN Red List are experiencing a decline in population trends. Vaquita, Baiji, and the Yangtze are all famous small cetaceans that have either gone extinct in the wild or are on the brink of extinction.

Narrow-ridged finless porpoise, also a small cetacean, is a species endemic to the North-East Asia region. And with no surprise, just like other small cetacean species, NRFPs also face a bycatch threat and suffer from deficient information. To address such challenges, this report, for the first time, collects all official existing information regarding the species inhabiting the Yellow Sea with collaboration from WWF-China and national research institutions.

(*Please, note that this report does not include DPRK information, due to lack of accessible information for DPRK's NRFP status*)

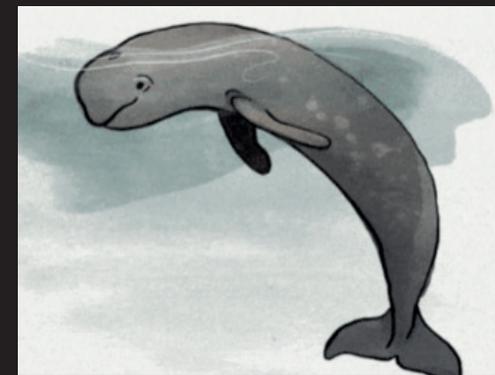
2. Cetaceans include porpoise and dolphins

NARROW-RIDGED FINLESS PORPOISE

TAXONOMY:

NARROW-RIDGED FINLESS PORPOISE (*NEOPHOCAENA ASIAEORIENTALIS*)

KINGDOM: ANIMALIA
PHYLUM: CHORDATA
CLASS: MAMMALIA
ORDER: ARTIODACTYLA
INFRAORDER: CETACEA
FAMILY: PHOCOENIDAE
GENUS: NEOPHOCAENA



© First Mates / WWF-US

The Narrow-ridged finless porpoise (NRFP) is not to be confused with the Indo-Pacific finless porpoise (*Neophocena phocaenoides*) which is found in the West of the Persian Gulf and along the coasts of India, Indochina Peninsula to the west and along the coasts of India, Indochina Peninsula to the Taiwan Strait. The two species diverged genetically during the last glacial maximum (1700-1800 years ago) when the land bridge between China mainland and Taiwan was established (Wang et al., 2008).

Within the NRFP, there are two sub-populations: the Yangtze and the East Asian finless porpoise. The Yangtze sub-population, as the name implies, inhabits the Yangtze river and is listed as critically endangered on the IUCN Red List. The East Asian sub-population inhabits the coastal areas of the East Asian countries. The latter is the target species of this publication.



© Wang et al.

On the left is the NRFP and on the right is the IPFP. Wang et al.(2010)

HABITAT RANGE AND ECOLOGY:

The East Asian subpopulation of NRFP inhabit the coast and are often found in shallow depths. They appear to have a strong preference for waters with a sandy or soft bottom (Jefferson and Huang 2004). On the shallow coasts, it feeds on variety of small fishes, cephalopods³, and crustaceans⁴ and being an opportunistic feeder, its consumption pattern differs according to the season and region (Ibis). For example, in the season when shrimps are abundant, which would be spring and fall for ROK, the species will most likely feed on shrimps and in seasons when octopuses are abundant, which would be fall and winter for ROK, the species will most likely feed on octopuses.

3. Molluscan species such as squid, octopus or nautilus.

4. Species such as crabs, lobsters, crayfish and etc.

MORPHOLOGICAL (PHYSICAL) FEATURE

As the name suggests, the species lacks a dorsal fin and has a round forehead. Instead of a dorsal fin, the species displays a dorsal ridge that can be up to 5 cm high with the highest point of the ridge found at about 50-65% of the body length (Jefferson and Huang 2004). The ridge connects

smoothly to the tail and small bumps, tubercles, can also be spotted along the ridge. It has a light grey skin color that has gone through a color fading phase as they are born with dark skin. Average adults are 1.55m in length and weigh about 30-45kg.

Being without fins, NRFPs are hard to spot with bare eyes.



© doopedia.co.kr



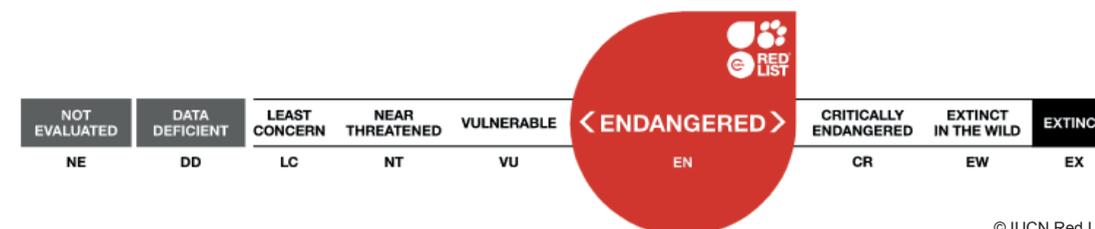
© WWF.org

It uses fifteen to twenty-one spade shaped teeth in each jaw to feed on various types of fish.

CONSERVATION STATUS

The species was registered on IUCN Red List as 'Endangered' in 2017, indicating that it has a risk of extinction in the wild. It is also listed in Appendix I of the Convention of International Trade in Endangered Species of Wild Fauna and Flora (CITES) and Appendix II of the

Convention on Migratory Species (CMS). Being registered in Appendix I of CITES, trading of the species is strictly forbidden. Furthermore, CMS calls for international cooperation among the range countries of the species to come up with conservation measures.



© IUCN Red List

GEOGRAPHIC SCOPE: THE YELLOW SEA

TRAITS

The Yellow Sea borders China, ROK, and DPRK. It is unique in that it is a relatively semi-enclosed body of water with average depths being only 60-80m (WWF). This shallow water provides a perfect habitat for the narrow ridged finless porpoise that has a preference for shallow water. Other than the narrow ridged finless porpoise, the sea flourishes with diverse living creatures including dugongs, marine turtles, pacific herring, etc. Some 1,600 species have been reported from the Sea's marine coastal habitats (McKinell & Dagg, 2010). Because of its rich biodiversity, the sea is one of the WWF's Priority Ecoregions.

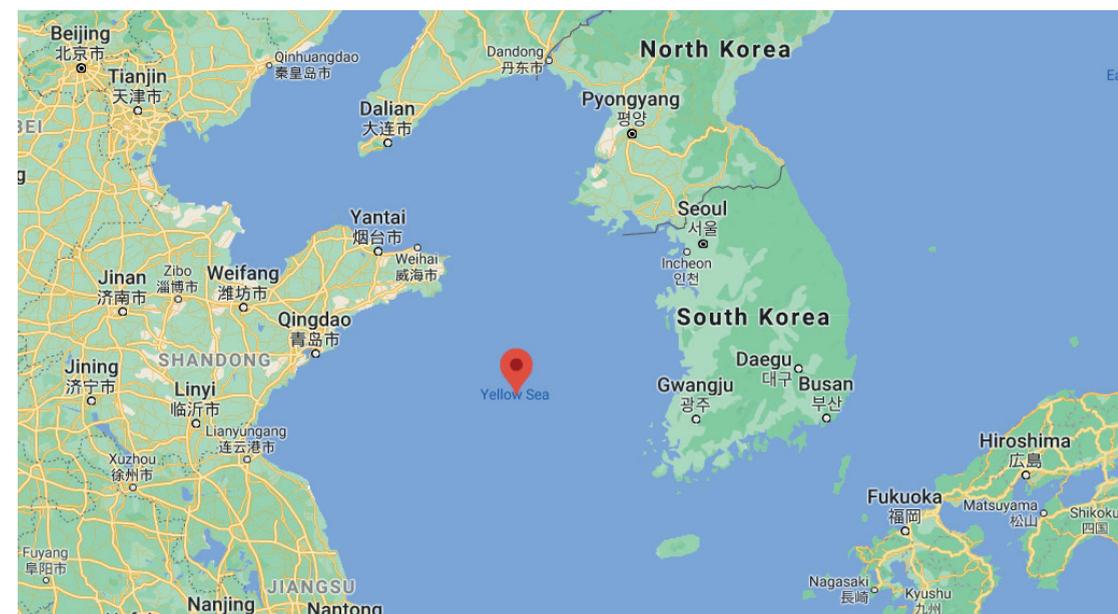
THREATS

With about 600 million people living in the areas that drain into the Yellow Sea, the sea is prone to various anthropogenic activities. (UNDP, 2000). Since the early 1980s, 35 percent of the mean area of intertidal habitat has been lost within the Yellow Sea (MacKinnon et al., 2012). The region is also one of the most exploited area as it borders countries with dense and high population. Heavy exploitation of fish resources in the region has resulted in almost all major stocks being fully fished by the mid-1970s and overfished by the 1980s (Zhang & Kim, 1999, Tang 2000). If the current imperil situation persists, they too will be impacted by the mentioned threats.



Led by Intergovernmental Oceanographic Commission (IOC) of UNESCO, with funding from GEF, Transboundary Water Assessment Programme has ranked the Yellow Sea's overall risk as very high due to various anthropogenic activities.

© Transboundary Water Assessment Programme 2015



© Google Map



CHAPTER 2: CONSERVATION STATUS

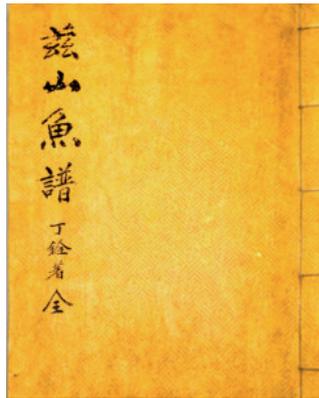
- REPUBLIC OF KOREA
- CHINA

© Antonio Busiello/ WWF-US

REPUBLIC OF KOREA

NRFPs, called ‘Sang-gweang-i’ in Korean, have long resided in the coasts of ROK. This is apparent through its appearance in Korea’s ancient document, *Jasan-Eobo* (Korean Atlas of Fish), written during the 18th century by Saint Chong Yak-jong. The document quotes “Currently, in the West and South coast, there are two types of a mermaid, one of them is ‘Sang-gwang eo’ which resembles human and has two bosoms.” The name ‘Sang-gwang-eo’ in ancient letters means that the species shine under the light. Other than the *Jasan-Eobo*, it has also appeared in ‘Nan-ho-eo-muk-ji’ and ‘Dong-eui-bo-gam’ with different names such as ‘Shoo-uk’ due to the sound it makes when it comes to the water surface to breathe and ‘Mul-gachi’.

These days, due to its friendly mask, it is often called a ‘smiling whale’. And, this amiable character is certainly an advantage in attempting to call for public attention. This is apparent through the species being used as a logo on clothing brands and being made into accessories, mostly designed by personnel interested in species conservation. However, this amiable species is experiencing a precipitous population decline on the coasts of Korea. This chapter will give an overview of the current population and research status of the species along with major threats and policies in existence to address such threats.



From left to right:
1) *Jasan-Eobo* (Korean Atlas of Fish) written during the 18th century entailing NRFP 2) A picture of campaign to raise awareness of the species between a celebrity artist and a fashion brand ‘Betow’ 3) NRFP keyring designed by a vet



© NIFS_CRI

ABUNDANCE AND DISTRIBUTION

NRFPs are the most abundant cetacean in the Korean seas, distributed in the west and south coasts, as well as south of the east coast. In ROK, distribution, and abundance of the porpoise are figured through a line-transect survey by the Cetacean Research Institute, NIFS (CRI). The organization uses a line-transect method to conduct population surveys on the West and South and East coast.

The largest population of the NRFPs exists on the West coast of ROK which is part of the Yellow Sea. Park et al. (2007) estimated that there are approximately 36,000 individuals on the West coast. On the east of the south coast, 82 individuals were observed in March 2010 while

on the west of the south coast 107 individuals were observed in June 2009 (Choi et al., 2010). For the East Coast, there has been few records of NRFP sighting through the survey.

West coast, despite being a location with the most abundant population, has experienced a 64 percent population decline from the years 2005 and 2011 according to Park et al. (2011). Unfortunately, for the south⁵ and east coasts, not enough data has been accumulated to figure a population trend.

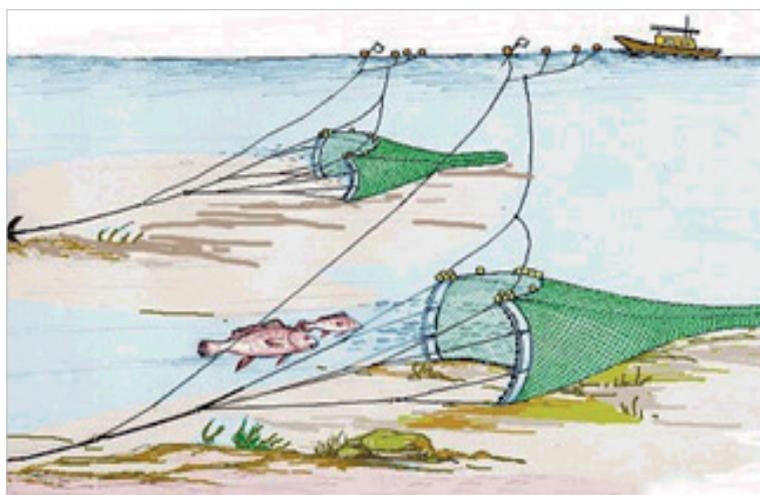
5. There is a difficulty in conducting line transect survey in the South coast due to numerous aquacultures and complicated shorelines.

MAJOR THREATS

[BYCATCH]

NRFPs are the most bycaught cetacean species in the ROK. According to the bycatch data given by CRI, from 2011 to 2019, 9,302 NRFPs were bycaught on the coasts of ROK. On the West coast, the coast with the highest number of bycatch, NRFPs were most frequently bycaught from April to June in stow-net on anchor, a gear that is most often used in the area. On the South coast, the coast that accounts for 12 percent of the total bycatch, bycatch occurred most frequently in November to January in trawl fishing gear. The East coast has a minimal bycatch occurrence with most frequent occurrence from November to March on gill nets.

Stow-net on anchor poses a severe threat to the species. Just in 2019, stow-net on anchor accounted for approximately 98 percent of the total bycatch of NRFP. The reason for such a large percentage of the total bycatch is due to how the gear operates. The gear uses strong and rapid current to bring forth the catch to the end of the net so it cannot escape. With this rapid current, it is not only the intended fish that gets captured but also the NRFPs. Once caught in the net, the NRFP suffocates as it cannot go above the water to breathe.



© Incheon Metropolitan City

Stow-net on anchor: Mostly used in the West Coast, as it is an area with rapid current, its target species differ according to the most abundant ones in each seasons.



© krc saemangeum

Saemangeum Sea dike artificially separating the two bodies of water.



© krc saemangeum

NRFP corpse floating on the surface of Saemangeum water.

[URBAN DEVELOPMENT]

On February 3rd, 2011, mass mortality of the species occurred at the Saemangeum Sea dike. This dike went through a reclamation project in 1991 intending to expand the land area by transforming the tidal flat and coastal areas into land and lake. Now, the dike separates the Yellow Sea and the Saemangeum estuary which were originally one body.

This artificial separation brought abrupt and radical change to the environment. NRFPs that were within the dyke during the winter faced a dramatic change, especially in regards to temperature and current. As the water inside the dyke has a very minimal current, the surface water freezes more easily compared to water without an artificial block. This caused difficulty for porpoises that needed to go up to the water to breathe, leading to suffocation (Park et al., 2012). Park et al. report that in total 249 NRFPs were found dead in the winter of 2011 at the dyke.

POLICIES AND REGULATIONS

The species is protected and managed under the two national major acts and one regulation:

- 1) 'Act on Conservation and Management of Marine Ecosystem (ACMME)' and
- 2) 'Fisheries Act (FA)'
- 3) 'Cetacean resource management and conservation Notice (CRMCN)'.

The first act, ACMME, focuses on conserving the species while the second act, FA, focuses on 'managing' the species as a resource, with the CRMCN coming in to bring detailed guidelines to the FA's regulations regarding cetaceans. The two acts are overseen by two different departments of the MOF. ACMME is covered by Marine Ecology Department and FA is covered by the Fisheries Policy Department. While both acts deal with bycatch, the two acts have a different approach to the matter. ACMME lightly deals with it through recommendation of researching bycatch mitigation measures. FA deals with legal implication when bycatch or illegal actions following bycatch is to occur by fisheries or any concerned entities. CRMCN gives guidelines on how bycaught or stranded cetaceans are to be dealt and handled by fisheries and those who come across stranded bodies.

[ACT ON CONSERVATION AND MANAGEMENT OF MARINE ECOSYSTEM (ACMME)]

It is under the ACMME that **marine protected species (MPS) and marine protected areas (MPA)** are designated and managed. Currently, including the NRFPs, 80 species are protected as MPSs with 16 species being marine mammals. The act defines MPSs as followings

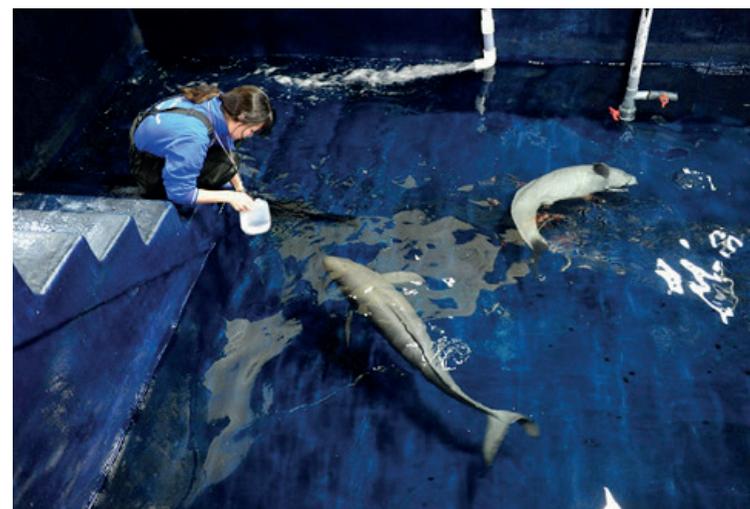
- the country's indigenous species,
- species undergoing pronounced population decline
- species with high academic research and economic value
- species with high international conservation value (Act on Conservation and Management of Marine Ecosystem 2018 (MOF) (ROK)).

MPSs cannot be traded, captured, collected, stored, processed, or damaged unless the government has permitted the bodies to be utilized for academic study or species' restoration and proliferation. When, one is caught trading the species for commercial purposes, one will be charged with a fine that is twice or ten times the original price. When caught attempting to harm, capture or collect the MPSs, whether by laying bombs, gears, or traps, the person will be sentenced to a maximum of 3 years of prison or a fine of a maximum of 30,000,000 won. Also, if one is caught storing, trading, or manufacturing the MPSs, the person will be sentenced to 2 years or less of prison and a fine of 20,000,000 won or less. Lastly, when caught having obtained the government's permission to collect or capture the MPSs in an illegal manner, the person will be sentenced to a maximum of one year of prison and a fine of a maximum of 10,000,000 won.



MOF has designated the NRFP as a marine species for the month of March in the year 2020 to raise public awareness of the species. (MOF, 2020)

© Ministry of Oceans and Fisheries.



Two NRFPs, caught in set net, being treated at Busan Aquarium

© National Institute of Fisheries Science

The act, also, outlines measures to be taken when one comes across a stranded or injured marine species. When a person comes across an injured or stranded marine species deemed to be in threat of extinction or indigenous to the country, he or she should report to coastal guards so that it can be transported to a designated institution for treatment. However, a stranded or injured marine species is to be taken to an institution, only when it is determined to have a difficulty in returning to the wild. Currently, 11 institutions have been designated for the purpose of treating such marine creatures. When an institution is designated for such a purpose, it is eligible for government funding. Once coastal guards have

been called to the scene of stranding or injury, the police need to request for dispatch of such institution to come to the site and transport the animal to the institution. When fully treated and deemed capable of surviving in the wild, the animal must be released back into the wild. As of now, a total of 6 NRFPs have been treated in such institutions.

[FISHERIES ACT (FA)]

The ACMME also defines areas that have the possibility of MPA designation as follows: a) maintain ecological aboriginality with rich biodiversity, b) poses unique geographic and geological features and holds a research value c) hold high primary productivity and acts as a spawning area or acts as a habitat for MPSs d) represent a variety of marine ecosystem e) pose exceptional beauty both above and below the surface f) need further conservation to maintain or improve marine ecosystem's carbon absorption capacity g) have been designated by a presidential ordinance to conserve the marine area (Act on Conservation and Management of Marine Ecosystem 2018 (MOF)(ROK)). As of now, 30 MPAs are in existence including the wetland protected areas. And, of the total exclusive economic zones of the country, 1.9% are marine protected areas.

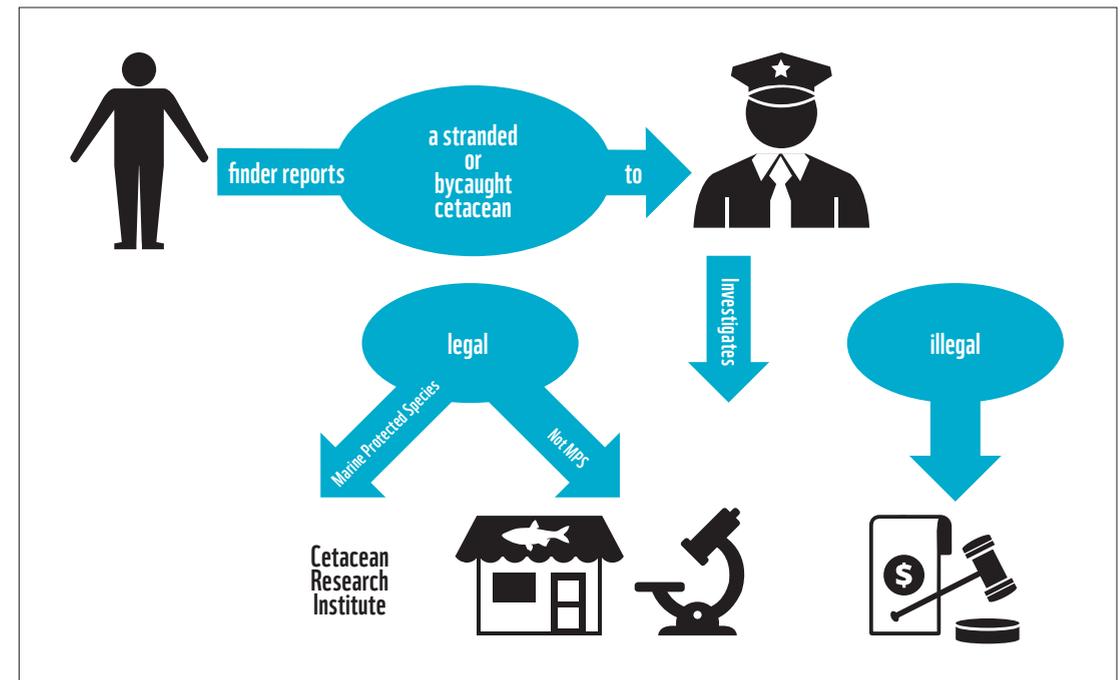
Lastly, regarding bycatch, the act does not deal deeply with bycatch as it requires action from the fisheries which is not the main focus of ACMME. However, it does mention that all fisheries need to make an "effort" to avoid bycatch of marine mammals and MPSs. It further states that the country and provinces need to make an effort to research and develop technical measures to mitigate bycatch. However, there is limited information on the details on what "effort" connotes and what kind of support can be provided to research and develop technical measures to mitigate bycatch.

Under the FA, fisheries are provided with repercussions to face regarding bycatch. It indicates, unless the bycaught marine creature has been allowed for capture with the allowed quantity and through the government's permission for bycatch, fisheries are to face repercussions for bycatch. Even when applicable fisheries have permission for bycatch, they must attach a bycatch mitigation device to fishing gears. And, when a bycaught marine creature has a permissible legal status for capture and trade, it must only be traded and sold at a designated area. When one is caught fishing without a bycatch mitigation device or trading/selling bycaught marine creatures at an area other than designated areas, he or she can be fined a maximum of 10,000,000 won.

[CETACEAN RESOURCE MANAGEMENT AND CONSERVATION NOTICE (CRMEN)]

CRMEN gives details on how stranded and bycaught cetaceans are to be dealt with and in what cases capture is allowed by the fisheries. It states that unless a catch of cetaceans is for scientific research or treatment and rescue purpose, personnel is not allowed to catch and capture cetaceans. To prevent such illegal catch and capture, a minister of MOF can have a public servant observer board on a vessel, when the minister deems that it is necessary. In terms of bycaught, drifted or stranded marine cetaceans, marine police, called at the sight, must investigate whether there was an illegal action for a catch.

And, when a body is found dead without any sign of illegal action, marine police permits a reporting personnel to sell the corpse to a designated market or to discard or to conduct research, unless it is a MPS. However, if a body is found to be MPS, coast guards need to report to a relevant organization which will then notify a minister of MOF while also accumulating data and information on the species.



Summary of bycatch and stranding reporting process (Kim, 2020)

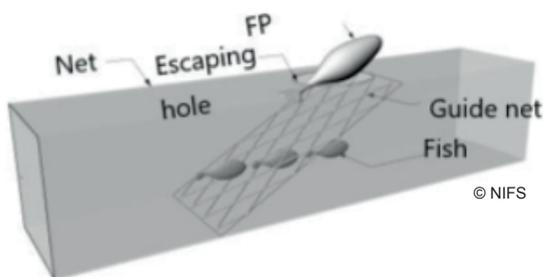
NOTABLE NATIONAL CONSERVATION ACTIVITIES

To conserve NRFPs, ROK

- 1) conducts line transect population survey and biological research⁶,
- 2) runs bycatch monitoring
- 3) makes an effort for bycatch mitigation and
- 4) designated part of the coast as NRFP MPA.

[BYCATCH MITIGATION]

As NRFPs are the most bycaught species in the country with stow-net on anchor accounting for approximately 98% of total NRFP bycatch cases in 2019, the National Institute of Fisheries Science (NIFS) has developed a device that helps the species to escape from the net when caught in the gear. This device has been invented based on the jellyfish excluder device, already in use by fisheries, and is meant to guide the NRFP caught in the gear out to the water while preventing the species from being swept by the current to the end of the net.



6. CRI conducts necropsies on NRFP corpse to figure causes of death for the species

This section will cover the country's efforts being made to conserve the species. As conduction of line transect population survey and bycatch monitoring has already been covered in previous sections, this section will draw its lens on bycatch mitigation effort and designation of NRFP MPA.

The device, invented in 2017, went into experimentation 54 times, in the year 2020 at the West Coast to figure catch loss, crucial to persuade fisheries for the device implementation, and efficacy in preventing NRFP bycatch. The device was attached at two different positions, top and bottom, to examine and compare catch loss. When attached at the top part of the gear, there was a 6.2% loss, and, when attached at the bottom of the device, there was a 10.1% catch loss. For both cases, there was no NRFP bycaught in the gear. Though for both cases percentage of loss was minimal, they signify a profit loss to fisheries, calling for an innovative measure to fill the profit margin.

To implement the device, MOF has formally stated the goal of installing the device on at least 100 stow-net on anchor vessels within 2021. MOF plans to carry out its goal through the '2021 fisheries resource debit system' which provides a financial incentive to fisheries making an effort to protect marine resources, including installation of the excluder device. There are high hopes that this device will be able to reduce NRFP mortality caused by bycatch on stow-net on anchor.

[GOSEONG NRFP MPA]

In December 2019, 210 ha of Goseong province's coast was designated as an MPA to conserve NRFPs. This designation marked the very first MPA designated for cetacean species. The province has formed the MPA's management and a policy task force to come up with a detailed

scheme for NRFP conservation and the area's utilization for tourism purposes. The province aims to collaborate with other provinces and countries that are inhabited by the species. It, also, aims to take a conservation approach that can also bring benefits to the residents.



A picture of Goseong NRFP MPA Task Force

WAY FORWARD

Despite various efforts by the country, there is always more to be done to conserve the little creature and prevent it from going extinct. This section suggests ROK government and research agencies to make following actions for more

effective conservation of the species. 1) Acoustic population monitoring 2) Experimentation of variety of bycatch mitigation measures 3) Utilization of local experts and resources for bycatch and stranding response,

[POPULATION MONITORING]

Currently, as mentioned in the previous sections, the CRI conducts regular line-transect surveys on the coasts of ROK. It was through this method that the institution was able to figure a declining population trend on the West coast. However, as NRFPs are without fins, there is a limitation in being solely reliant on sighting surveys for accurate population trend estimation.

species' population trend and habitat. Hence, conduction of acoustic monitoring on the species will greatly enhance current population data and biological knowledge regarding the species.

F-POD, an acoustic device, can be used to monitor population trend and ecological behavior for conservation purpose.

For this reason, acoustic population trend monitoring is suggested for such a cryptic species like NRFP. Once deployed into a sea, the device can last for 4 months without much interference during operation. As the device operates 24hrs throughout its release in an ocean, it can also monitor the trend in the night time, which often shows a different number than in day time. This way a researcher can get a more accurate view into the population trend status. It was through acoustic population trend monitoring that researchers were able to figure a dramatic decrease of Vaquitas in the Mexican Gulf. Researchers also found that there were more Baltic Sea Harbor Porpoises than they previously assumed as they found a large hotspot through acoustic monitoring. Therefore, for both Baltic Sea Harbor Porpoises and Vaquitas, acoustic monitoring allowed a better investigation of the



© Chelonia Limited



Picture of a pinger deterring a dolphin from coming near to the net.



LEDs can be attached to a fishing net to prevent bycatch of marine animals.

[BYCATCH MITIGATION: LED & PINGER]

To mitigate bycatch of the species, the ROK government modified a jellyfish excluder device and transformed it into an NRFP excluder device that can be attached to stow-net on anchor. This is an efficient way to mitigate bycatch as it utilizes the device that was already in use by the fisheries. While this may be a good local adapt solution, other bycatch mitigation devices, frequently used around the globe, like pingers and LEDs also need experimentations in ROK. Pingers can prevent bycatch of NRFPs by giving a sonar signal to the species and deter them from coming near gears. LEDs can prevent bycatch of the species by giving a visual signal to the species from coming near gears. Experimentation, comparison, and analysis of catch difference along with bycatch efficacy while using pingers, LEDs, and an excluder device are needed for the most effective solution for bycatch.

[NRFP STRANDING AND BYCATCH RESPONSE]

As mentioned in the previous section, when a person comes across a live stranded NRFP, they are to report to a coastal guard. And, a coastal guard on the site determines whether the species are in the condition to be released back to the ocean or to be taken to an institution designated for treatment. However, this is done on the premise that the species does not have any signs of illegal capture.

This system is at odds as coastal guards are not experts in determining marine organism's health status, though they may have an expertise in detecting signs of illegal capture. Through an interview conducted by WWF-Korea, a majority of coastal guards indicated that they have difficulty in recognizing the species of stranded body.

The system of responding to stranded and bycaught NRFPs can be strengthened through the usage of local experts and resources. The U.S operates a stranding network consisting of local institutions and experts as an exemplary case of effective utilization of local resources. ROK can also utilize local institutions and experts and make an effort to decentralize the task of responding to stranding/bycatch events⁷.

⁷ Currently, when coastal guards have difficulties in determining the health status or differentiating species of stranded cetaceans, they contact the CRI.

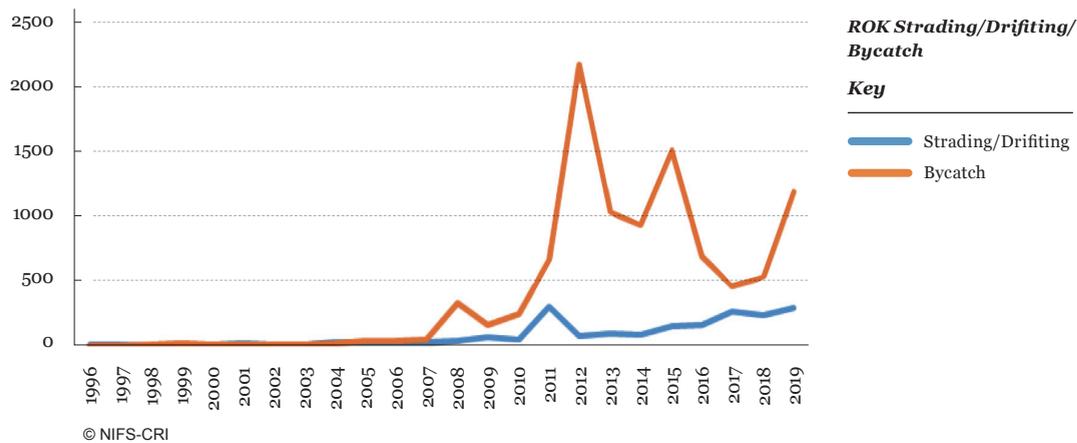
CHINA

[MPS GAP & A NEED FOR CARROTS]

Before the species was registered as MPS and regulation came into force to prohibit sales and trading of the species, fisheries could sell the dead bycaught corpse and make money out of the body. However, after the species got registered as MPS in 2016 and a regulation banning commercial use of NRFP bodies came into force in 2017, fisheries could no longer make money out of the corpse as they were not allowed to sell it.

simply think that this is because the MPS policy started to take an immediate effect. However, another speculation that needs to be made is that the fishermen simply discarded bycaught NRFP at the sight as it no longer meant monetary value for him or her to report it. This may explain the 2017's rise of stranded NRFP corpses as it could be bycaught NRFPs that were discarded by fisheries on sites that drifted to land.

In 2017, the year that trading and selling of the species got banned, the bycatch reporting number of the species significantly dropped. One may



Hence, the current Marine Protected Species (MPS) status needs an improvement in dealing with the bycatch issue of the species. The department that deals with MPS, the marine ecology department, does not have a major jurisdiction to tackle bycatch. This jurisdiction lies under the fisheries policy department. Therefore, for effective conservation, the current MPS regulation needs to ensure that NRFP

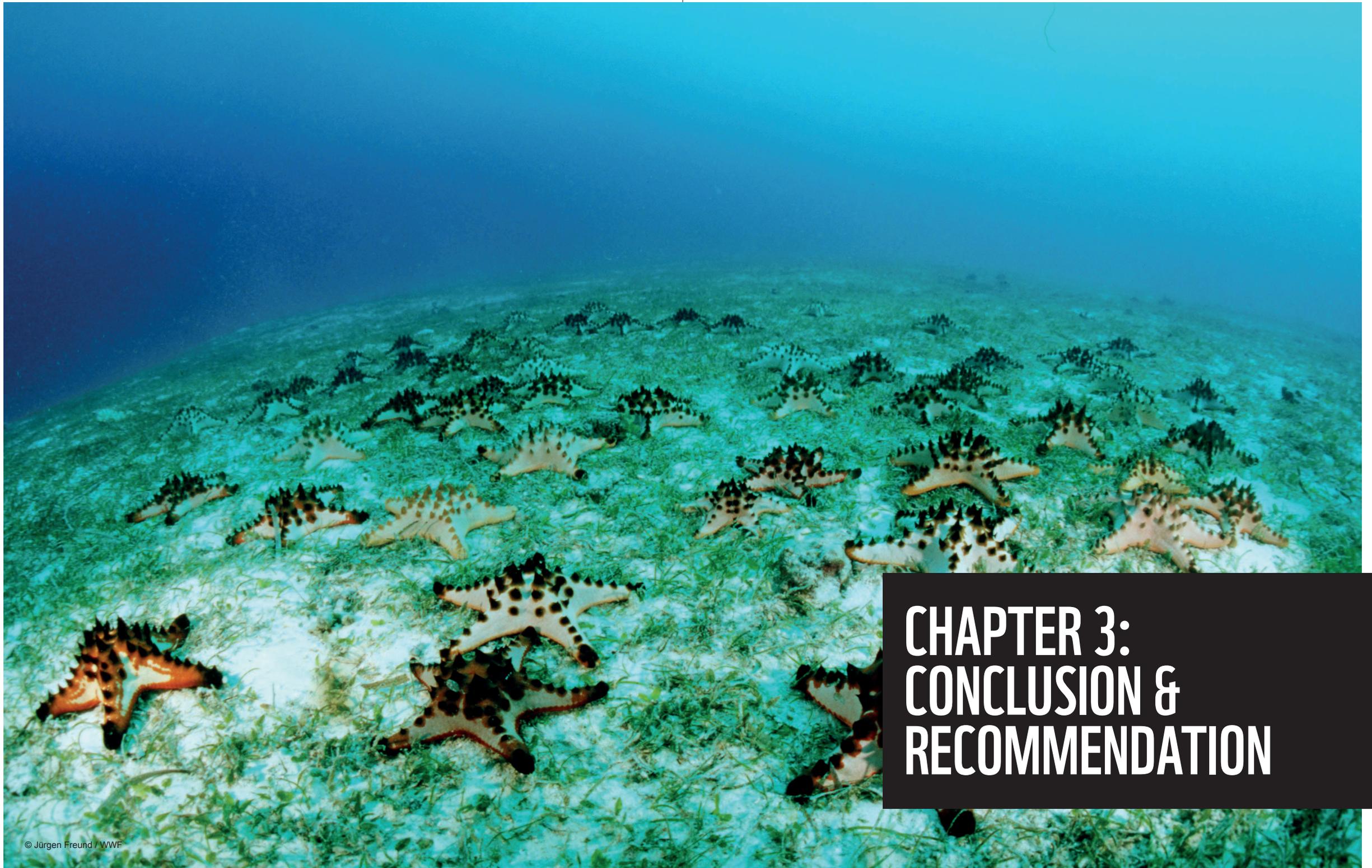
receives the conservation measure to mitigate its major threat, bycatch, to which it is fully entitled as an MPS. And, this measure must address the current situation where fisheries are no longer motivated to report bycatch as they could no longer use the bodies for commercial purposes after 2017. Possible ways to address such a situation could be to provide an incentive for fisheries reporting bycatch.

As mentioned in the above sections, there are two sub-species of narrow-ridged finless porpoise namely Yangtze finless porpoise and East Asian finless porpoise. East Asian finless porpoise (EAFP) is the only common cetacean in the Yellow Sea and the Bohai Sea. However, research on EAFP on the China side has been limited in the past due to lack of research funding to support large scale and long-term monitoring, while the species is intrinsically not easy to observe due to its small size, lack of dorsal fin, short exposure on the surface and timid character. There were limited scientific reports published in the past decades on distribution, migration, physiology, and pathology based on stranding cases (Zuo et al 2018). From these previous studies, it was reported that EAFP in Bohai Sea mainly occurred nearshore and around estuaries within 50m depth, and their breeding season was around May.

Since 2011, the research team of Yellow Sea Fisheries Research Institute have started to investigate EAFP intermittently by collecting bycatch samples and recording the sightings during fishery resource surveys in the Yellow Sea and the Bohai Sea. In 2018, the team preliminarily estimated the EAFP population in the Bohai Sea as 7883 porpoises, and they started to systematically survey the population in the inshore waters of the Bohai Sea and the Yellow Sea including the areas from Qingdao to Lianyungang, Changdao, Laizhou Bay, Liaodong Bay, except Yalujiang Estuary and identified the hotspot distributions (Li 2020). It was reported a relatively smaller population of EAFP occurs in the Bohai Sea than in the southern Yellow Sea and Inland Sea of Japan (Zuo et al 2018).

Limited quantitative analysis was reported on the death of EAFP in China due to the lack of systematic stranding studies. However, the major threats faced by EAFP were believed to be mainly fisheries bycatch and accidents (Li 2020), while environmental pollution, malnutrition, and disease, as well as nearshore construction activities, may also cause unusual death of EAFP (Zuo et al 2018).

East Asian finless porpoise is under second class protection in China, as all the cetaceans are on the lists of wildlife under special state protection. Behaviors like hunting, catching, killing, selling, purchasing, transporting, or carrying animals on the list will be subjected to legal penalty. In recent years, research institutes and NGOs have started to pay attention to EAFP and conduct research, survey, public education activities, etc. to enhance our understanding of EAFP as well as raising awareness of public and fishermen communities on the importance of this species. However, these works are still at a relatively early stage and specific protection plans and marine protected areas are still lacking. Thus, collaboration work to verify the status of the porpoise and develop a comprehensive conservation strategy, as well as building capacity, is necessary to protect this endangered species.



CHAPTER 3: CONCLUSION & RECOMMENDATION

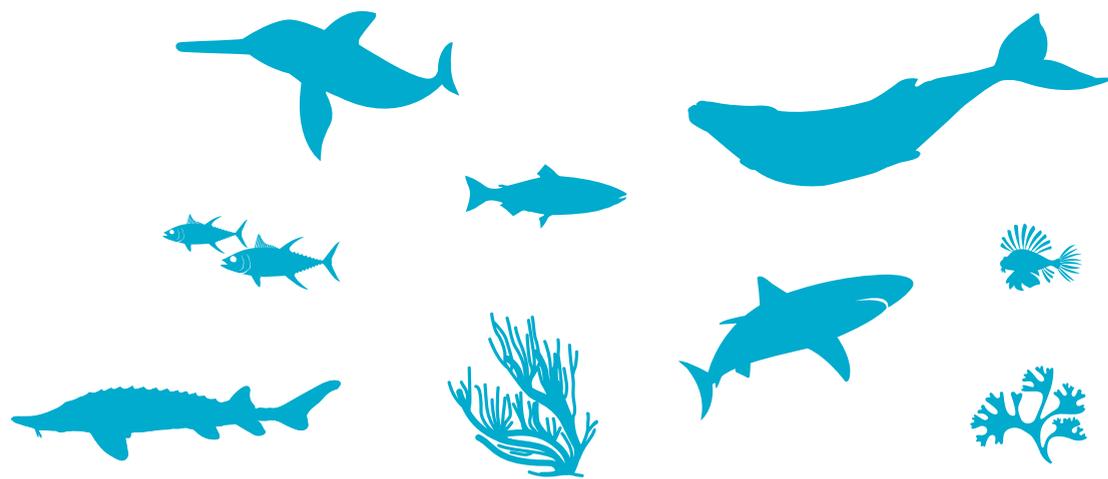
© Jürgen Freund / WWF

As the only common cetacean species in the Yellow Sea, with limited studies, the species has the potential to act as a diplomat for the bordering countries that are otherwise separated due to political circumstances. ROK, China, and DPRK can create a network of Civil Society Organization (CSO) and academia to conduct population, bycatch, and movement monitoring of the species. Such a network will allow an opportunity for collaboration and promote knowledge/skill-sharing among countries and accelerate the progress of knowledge accumulation regarding the species. Through data and knowledge gathered through the network, the network should bring in policy makers from the countries so that CSOs and academia can advocate for a new or adjustment of policies and activities for effective conservation.

Possible activities for the network may include the following.

- 1) Collaboration of the countries' government to create NRFP corridor, if and when the species has been identified to migrate across borders
- 2) Co-creation and management of NRFP stranding and bycatch data warehouse and the making of such data into an interactive map for the public
- 3) Co-branding of NRFP friendly seafood label to incentivize fisheries to implement bycatch mitigation measures proven to be effective through experimentation.

Once the activities for the species have become stable with a successful outcome, the network can further extend to other common species of the area.



REFERENCES

1. Act on Conservation and Management of Marine Ecosystem 2018 (MOF)(ROK)
2. Act of Fisheries 2019 (MOF) (ROK)
3. Borunda, A. (2019, January 16). 2018 was the ocean's hottest year. We'll feel it a long time. Retrieved January 29, 2021, from <https://www.nationalgeographic.com/environment/2019/01/oceans-warming-faster-than-ever/>
4. Choi, S., Park, K., Kim, H., Lee, Y., Park, J., Moon, D., Ahn, Y. (2010). South Coast Finless Porpoise Distribution. Korean Journal of Fisheries and Aquatic Studies
5. Climate Change Evidence: How Do We Know? (2021, January 22). Retrieved January 29, 2021, from <https://climate.nasa.gov/evidence/>
6. Davidson, A. D., Boyer, A. G., Kim, H., Pompa-Mansilla, S., Hamilton, M. J., Costa, D. P., ... & Brown, J. H. (2012). Drivers and hotspots of extinction risk in marine mammals. *Proceedings of the National Academy of Sciences*, 109(9), 3395-3400.
7. Elliott, W., Sohn, H., Burgener, V., (2009). Small cetaceans. *The forgotten whales*
8. Jefferson, T. A., & Wang, J. Y. (2011). Revision of the taxonomy of finless porpoises (genus *Neophocaena*): the existence of two species. *Journal of Marine Animals and Their Ecology*, 4(1), 3-16.
9. Lee, S., Choi, S., Kim, J. H., Kim, H. W., & Sohn, H. (2018). Characteristics of the Cetacean Bycatch in Korean Coastal Waters from 2011 to 2017. *Korean Journal of Fisheries and Aquatic Sciences*, 51(6), 704-713.
10. MacKinnon, J., Verkuil, Y.I. & Murray, N. 2012. IUCN situation analysis on East and Southeast Asian
11. McKinnell, S.M. and Dagg, M.J. [Eds.] 2010. *Marine Ecosystems of the North Pacific Ocean, 2003-2008*. PICES Special Publication 4, 393 p.
12. Intertidal habitats, with particular reference to the Yellow Sea (including the Bohai Sea). Occasional Paper of the IUCN Species Survival Commission No. 47. IUCN, Gland, Switzerland and Cambridge, UK. ii + 70 pp.
13. Jin, X., & Tang, Q. (1996). Changes in fish species diversity and dominant species composition in the Yellow Sea. *Fisheries Research*, 26(3-4), 337-352.
14. Park, K. J., Lee, S. Y., An, Y. R., Kim, H. W., An, D. H., Kim, D. N., & Kim, Y. H. (2014). Reappearance and Distribution Tendency of Finless Porpoises *Neophocaena asiaeorientalis* after their Mass Mortality in the Saemangeum Dyke. *Korean Journal of Fisheries and Aquatic Sciences*, 47(6), 978-982.
15. Pimiento, C., Leprieur, F., Silvestro, D., Lefcheck, J. S., Albouy, C., Rasher, D. B., ... & Griffin, J. N. (2020). Functional diversity of marine megafauna in the Anthropocene. *Science Advances*, 6(16), eaay7650.
16. Randall R. Reeves (Chair, C., & John Wang (Formosa Cetus Research and Conservation Group). (2017, August 15). The IUCN Red List of Threatened Species. Retrieved January 29, 2021, from <https://www.iucnredlist.org/species/41754/50381766#text-fields>
17. WWF (2020) Living Planet Report 2020 - Bending the curve of biodiversity loss. Almond, R.E.A., Grooten M. and Petersen, T. (Eds). WWF, Gland, Switzerland
18. Sohn, H., Park, K. J., An, Y. R., Choi, S. G., Kim, Z. G., Kim, H. W., ... & Park, T. G. (2012). Distribution of whales and dolphins in Korean waters based on a sighting survey from 2000 to 2010. *Korean Journal of Fisheries and Aquatic Sciences*, 45(5), 486-492.
19. Sohn, H., Paark, K., Kim, J., & Jang, C., (2004). Distribution of *Neophocaena phocaenoides* distribution and abundance in the West coast. *Korean Journal of Fisheries and Aquatic Science*
20. Tang, T.L., Tang, Q. & Pauly, D. (2000), A preliminary approach on mass balance Ecopath model of the Bohai Sea. *Chinese Journal of Applied Ecology* 11 (3): 435-440
21. UNDP., (2000) Yellow Sea Large Marine Ecosystem Preliminary Transboundary Diagnostic Analysis.
22. Wang, J. Y., Frasier, T. R., Yang, S. C., & White, B. N. (2008). Detecting recent speciation events: the case of the finless porpoise (genus *Neophocaena*). *Heredity*, 101(2), 145-155.
23. Yangtze finless porpoise is listed as Critically Endangered. (n.d.). Retrieved January 29, 2021, from [https://iucn-csg.org/yangtze-finless-porpoise-is-listed-as-critically-endangered/#:-:text=The%20Yangtze%20finless%20porpoise%20\(Neophocaena,Red%20List%20of%20Threatened%20Species.](https://iucn-csg.org/yangtze-finless-porpoise-is-listed-as-critically-endangered/#:-:text=The%20Yangtze%20finless%20porpoise%20(Neophocaena,Red%20List%20of%20Threatened%20Species.)
24. Zhang, C.I. & Kim, S. (1999) Living marine resources of the Yellow Sea Ecosystem in Korean waters: status and perspectives, p. 163-178 in: Scherman, K. and Tang, Q (eds), *Large Marine Ecosystems of the Pacific Rim: Assessment, Sustainability and Management*. Blackwell Science Malden U.S.

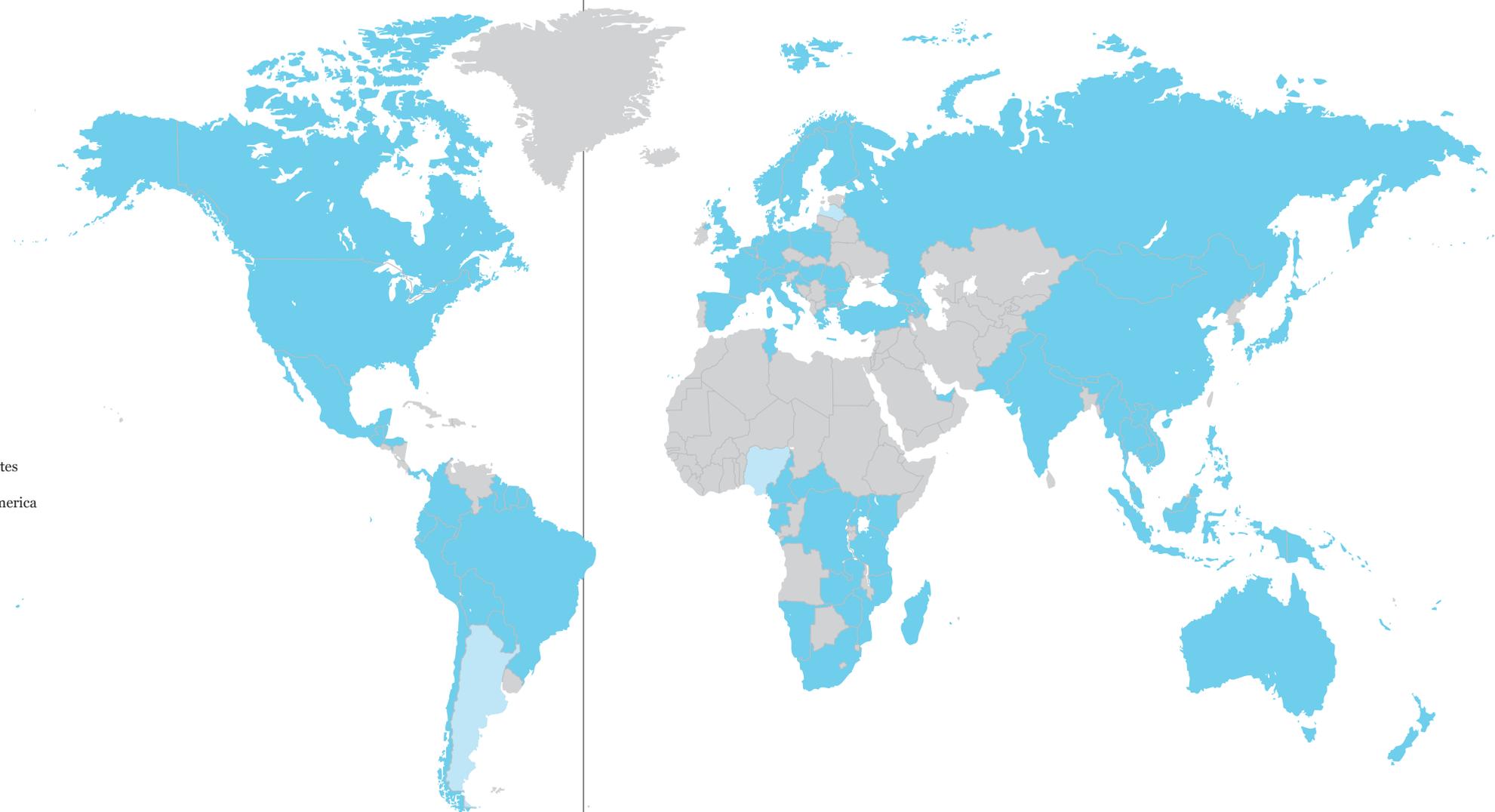
WWF WORLDWIDE NETWORK

WWF Offices

- Armenia
- Australia
- Austria
- Azerbaijan
- Belgium
- Belize
- Bhutan
- Bolivia
- Brazil
- Bulgaria
- Cambodia
- Cameroon
- Canada
- Central African Republic
- Chile
- China
- Colombia
- Croatia
- Cuba
- Democratic Republic of Congo
- Denmark
- Ecuador
- Fiji
- Finland
- France
- French Guyana
- Gabon
- Georgia
- Germany
- Greece
- Guatemala
- Guyana
- Honduras
- Hong Kong
- Hungary
- India
- Indonesia
- Italy
- Japan
- Kenya
- Korea
- Laos
- Madagascar
- Malaysia
- Mexico
- Mongolia
- Morocco
- Mozambique
- Myanmar
- Namibia
- Nepal
- Netherlands
- New Zealand
- Norway
- Pakistan
- Panama
- Papua New Guinea
- Paraguay
- Peru
- Philippines
- Poland
- Romania
- Russia
- Singapore
- Slovakia
- Solomon Islands
- South Africa
- Spain
- Suriname
- Sweden
- Switzerland
- Tanzania
- Thailand
- Tunisia
- Turkey
- Uganda
- Ukraine
- United Arab Emirates
- United Kingdom
- United States of America
- Vietnam
- Zambia
- Zimbabwe

WWF Associates

- Fundación Vida Silvestre (Argentina)
- Pasaules Dabas Fonds (Latvia)
- Nigerian Conservation Foundation (Nigeria)





**OUR MISSION IS TO STOP
DEGRADATION OF THE PLANET'S
NATURAL ENVIRONMENT AND TO
BUILD A FUTURE IN WHICH
HUMANS LIVE IN HARMONY
WITH NATURE.**



WWF(세계자연기금)는 지구의 자연환경 파괴를 막고
자연과 인간이 조화롭게 공존하는 미래를 위해 일하는
세계 최대 자연보전기관입니다.

together possible. panda.org

© Magnus Lundgren/ Wild Wonders of China/ WWF
© 1986 Panda symbol WWF – World Wide Fund for Nature (Formerly World Wildlife Fund)
© “WWF” is a WWF Registered Trademark. WWF, Avenue du Mont-Bland,
1196 Gland, Switzerland. Tel. +41 22 364 9111. Fax. +41 22 364 0332.
This report has been sponsored by WWF-Netherlands and Marine Mammal Commission.