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Proposal of YSLME biodiversity conservation plan in PR China

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Background

The Yellow Sea is one of the 66 LMEs with rich marine biological resources and regional fishing ground. It is noted for an extremely high biodiversity.

There are about 339 species of fishes, 100 species of polychaetes, 171 species of mollusks,107 species of crustaceans, and 22 species of echinoderms found in this region. (UNDP/GEF,2013).

It provides significant ecological service and support. The Coastal Water Mass, the Yellow Sea Central Cold Water Mass and the Southern Yellow Sea High salinity Cold Water Mass are 3 basic water mass of Yellow Sea. The activities of these CWM can help to regulate the climate, improve water quality, and enhance primary production.

The Yellow Sea has rich mineral resources, also is a key lane with several important port city along its seaside.

However, biodiversity in this region have been severely influenced through reclamation, pollution, the spread of invasive species and over-harvesting of marine organisms. Therefore, it is urgent and important to understand the current status of the biodiversity and their habitats, and to find out the conservation plans to better conserve the YSLME biodiversity in the future.

Threats to YSLME Marine Biodiversity

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2. Large impacts of sea reclamation

With the development of economy, the land recourses are gradually becoming one barrier for the development of coastal cities. Thus, the cities conduct sea reclamation in different scales, which narrows the space of coastal wetland and leads to the loss of biodiversity and reducing of eco-service. Meanwhile, the plant loss in wetland can make the defending capability of coasts against sea waves decline. Besides, sea reclamation in harbor areas will reduce the tidal capacity and hydrodynamic condition, thus increasing the turbidity of water. This would influence the photosynthesis and growth of the phytoplankton and damage the benthonic environment, and finally, this will make the primary productivity in certain sea regions decline.

3. Pollution

According to the data from China Marine Environmental Status Bulletin 2015, the average water quality of Yellow Sea that didn't reach the first level of sea water quality standard in 2015 was 160,260km^2. Thes
are most coastal water
land-based pollution a

海区	季节	第二类水质海域面积	第三类水质海域面积	第四类水质海域面积	劣于第四类水质海域面积	合计
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	春季	12 910	8 540	5 090	4 680	31 220
	夏季	12 010	8 090	4 750	4 060	28 910
	秋季	24 810	5 490	3910	7 330	41 540
黄海	冬季	23 600	7 750	4 730	6 110	42 190
	春季	13 900	8 490	5 940	8 190	36 520
	夏季	15 570	9 490	8 020	4 680	37760
	秋季	19 750	6 450	8 930	8 660	43 790
东海	冬季	19 180	13 290	19 750	50 520	102 740
	春季	21 400	11 430	10 330	33 980	77 140
	夏季	22 050	9 410	9 000	26 670	67 130
	秋季	16 080	14 480	12 880	40 770	84 210
南海	冬季	6 500	8 690	1 380	3 320	19 890
	春季	5 870	6 130	1 850	4 890	18 740
	夏季	4 490	9 910	1 800	4 610	20 810
	秋季	6 330	9 740	3 650	6 470	26 190
全海域	冬季	72440	40030	32 290	67 150	211910
	春季	54080	34590	23 210	51 740	163 620
	夏季	54 120	36900	23 570	40 020	154 610
	秋季	66 970	36 160	29 370	63 230	195 730

4. Pollution caused by mariculture

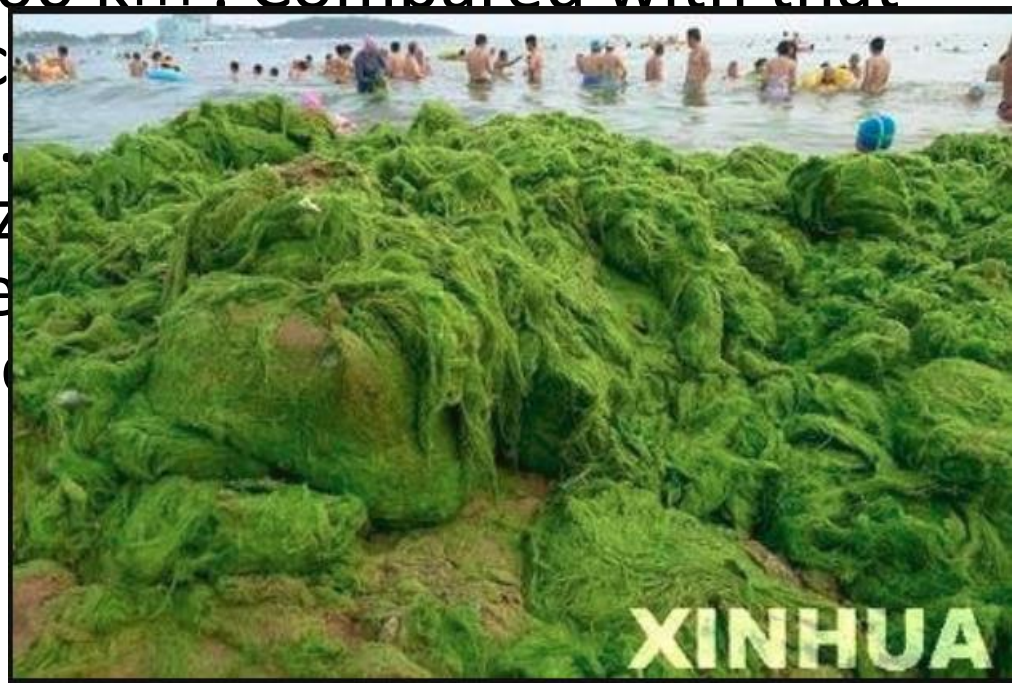
The accumulation of excrement and residual feeds of maricultural creatures and the discharge of waste water that hasn’t been purified could increase the nitrogen and phosphorus in sea water, thus aggravating the eutrophication and leading to the cultured red tide.

5. Marine environmental pollution caused by oil spill

The great need in energy resources increased the number of oil spill accidents year by year. The emergent oil spill could not only damage the ocean and coastal natural eco-environment badly, but also cause great economic loss in local fishery, aquaculture, and tourism. For example, between 2006 and 2008, there were 4 oil spill accident happened in Changdao, Shandong province, which caused huge loss to local people.

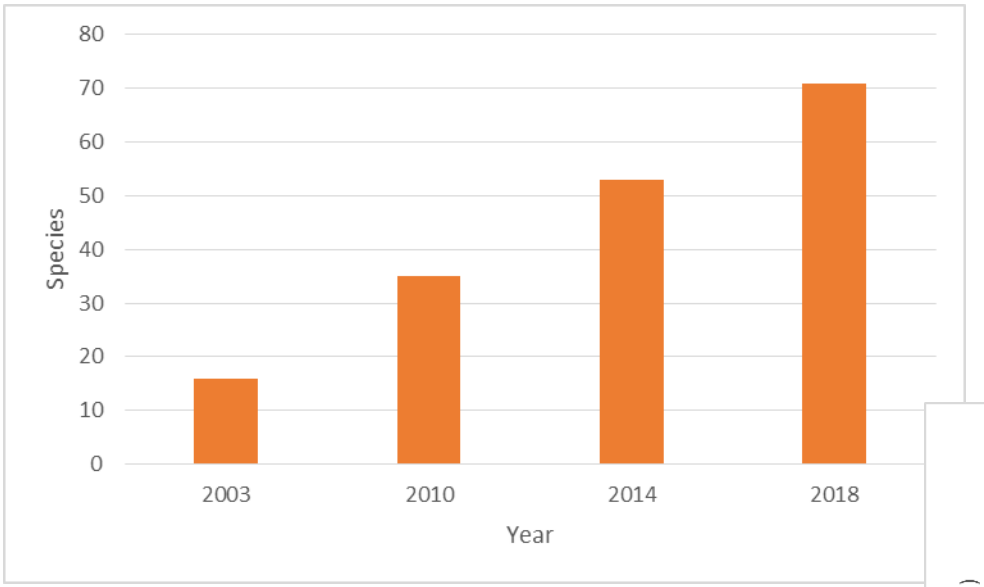
6. Frequent red tide and green tide

According to the data from China Marine Environmental Status Bulletin 2015, between 2011-2015, the five-year average area of red tide in Yellow Sea is over 1000 km^2. Compared with that number in 2004 whic
red tide is expanding.
marine ecological haz
and disappears in the
July since 2007. It als
economic damage to

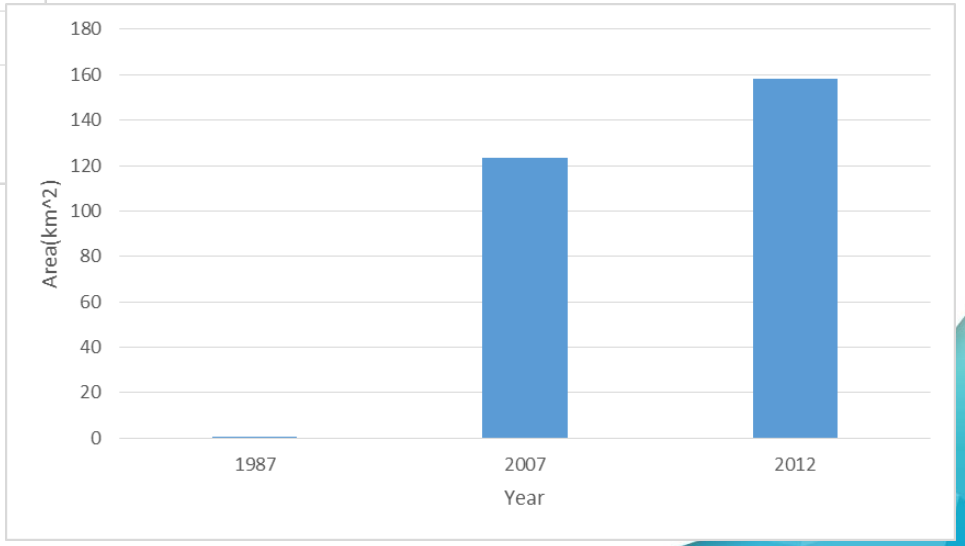


7. Invasive species

Spartina alterniflora

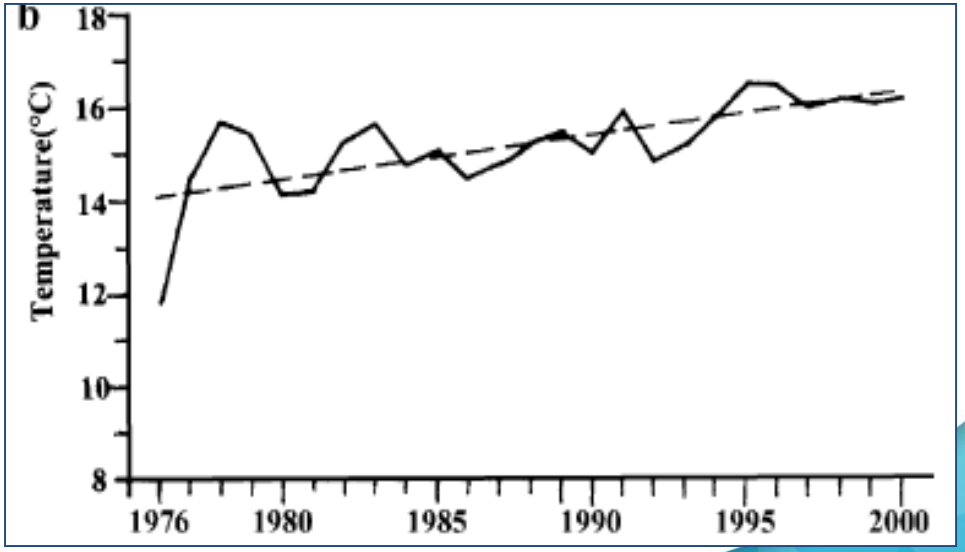


Invasive alien species



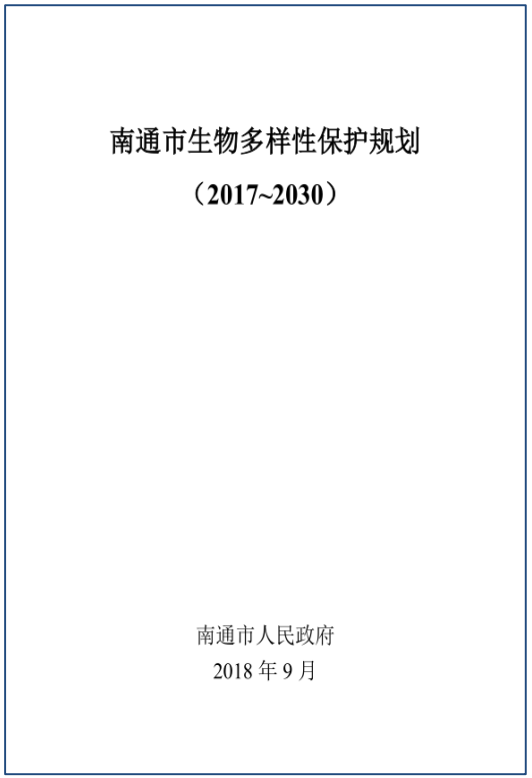
8. Climate change

In Yellow sea, the ascending temperature led to the decline of cold-water fishes species for losing the cold water mass habitat (Liu and Ning, 2011). Melting of sea ice may induce the habitat loss of seals.



Current progress in BD conservation

- **Law , regulations, plans**



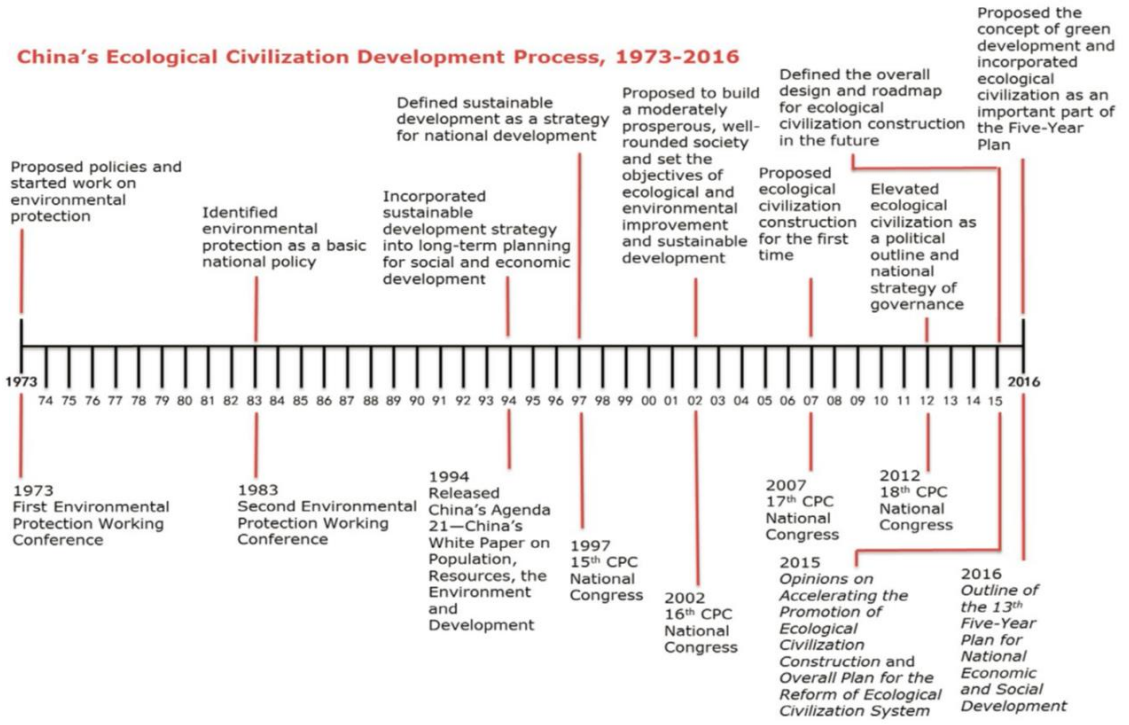
- **Fishery conservation effects**

In China, the Fisheries Law was revised in 2013, more fisheries conservation items have been developed. Ministry of Agriculture and Rural Affairs launched the regular monitoring survey on fisheries in coastal waters and inland waters since 2014, as well as the main spawning ground monitoring. And since 2017, the TAC and Quota management have been introduced in China fishery management, and the closed season extended to 4-4.5 months.

The control fishing vessels was conducted in 2003, and reduced 30000 fishing vessels to 2010, and there will reduce 20000 fishing vessels in 2020. The guideline of stock enhancement and marine ranching were issued by Ministry of Agriculture and Rural affairs in recent years, which will guide them to scientific development.

- **Marine Eco-civilization construction**

Since late 2012, the government has incorporated Eco-civilization into the “Five-in-One” blueprint of socialism with Chinese characteristics



In 2015, the State Council issued the Suggestions on speeding up the construction of eco-civilization, in which, strict guard on resource and environment red-line, scientifically design the forestry, grassland, wetland and marine red-line were suggested. Then, in 2016, State Oceanic Administration issued the Suggestions on national-wide construction of the marine red-line mechanism.

Until now, the eleven coastal provinces/cities have established their marine red-line designation. The marine red-line mechanism has been fully established in China. More than 30% sea area under jurisdiction and 35% coastal line have been included in the red-line paradigm.

- Shandong Province redline design
  - **Overall targets**

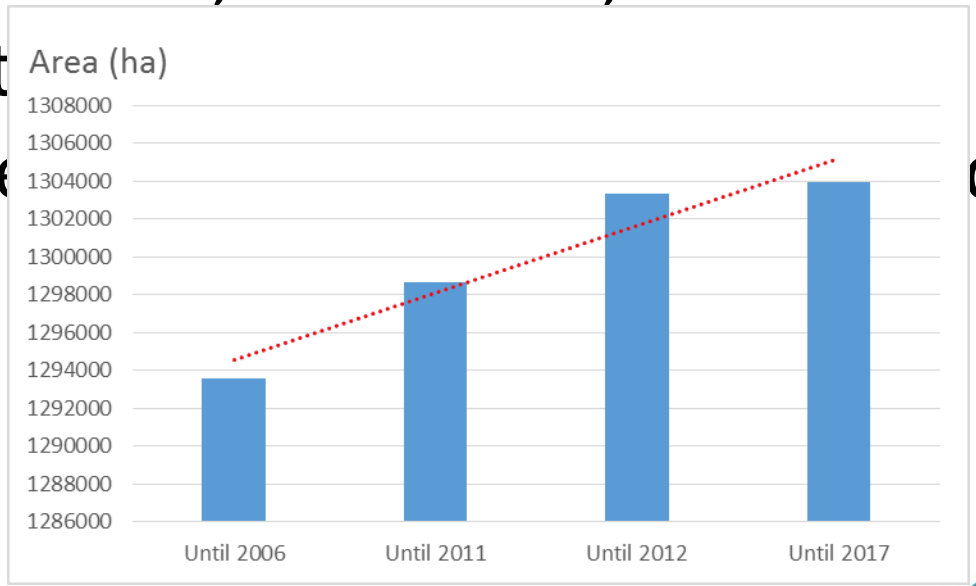
- Retention rate of Yellow Sea (YS for short) mainland natural coastal line is no less than 45%, island natural coastal line is no less than 85%
- Percentage of Marine ecological redline area is no less than 9% of the Yellow Sea area under the jurisdiction of Shandong Province
- Up to 2020, within the marine ecological red-line area, 100% of the pollutants directly discharged into sea meet the discharge standard. No new industry outlet is allowed. Most river inflows will be better than class V water standard.
- Up to 2020, more than 80% of sea water quality inside the marine ecological redline area meet the standard.

In Shandong Province, 151 redline zone were designated in Yellow sea area, in which, 36 were DPZ, 115 were DRZ. DPZ included marine protected area, important estuary system, important coastal v
area were ascribed
redline zones were
of the total Yellow

Each redline zone has its own pollution control and management rule and environmental protection rule. Up to 2020, all the sewage outlet must meet the discharge regulation, no more new industry sewage outlet can be added, total amount of land-based pollutant discharged into sea will be reduced by 10-15%.

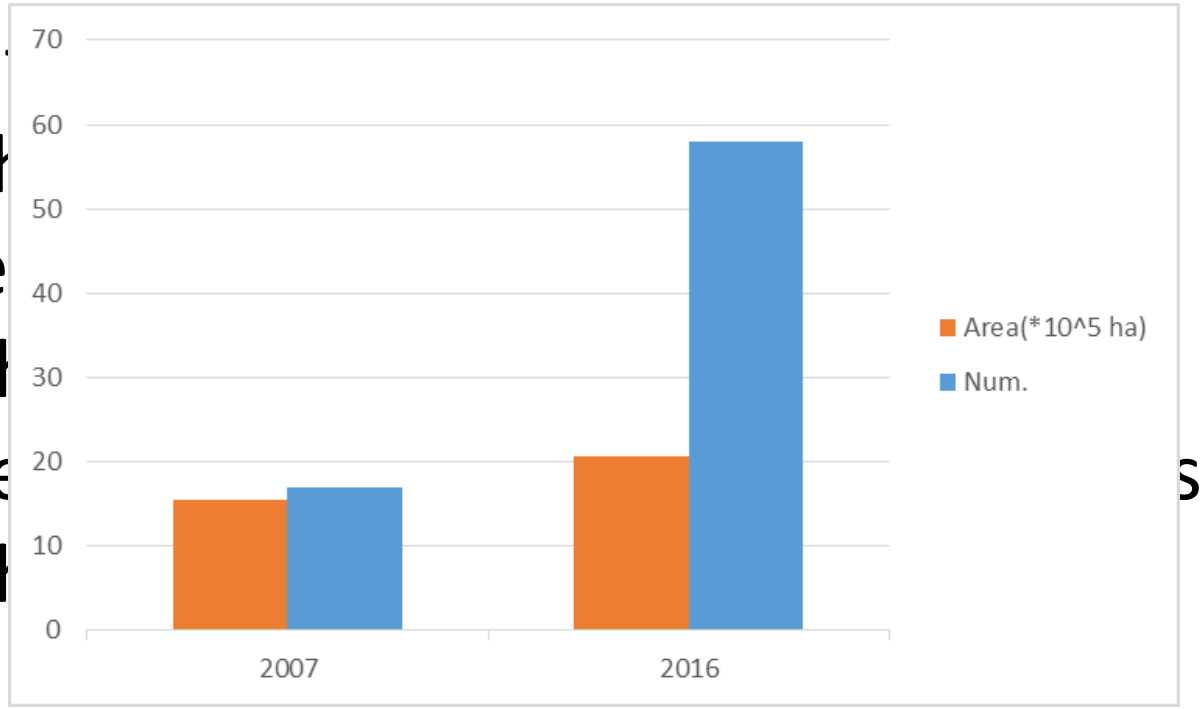
- **Rare species protection**

In YSLME area, more MPAs have been designated aiming at protect rare marine species. Before 2006, the total area of this kind of MPA was 1,293,601 ha, until 2017, this number increased t g more and more rare d.



• Habitat conservation

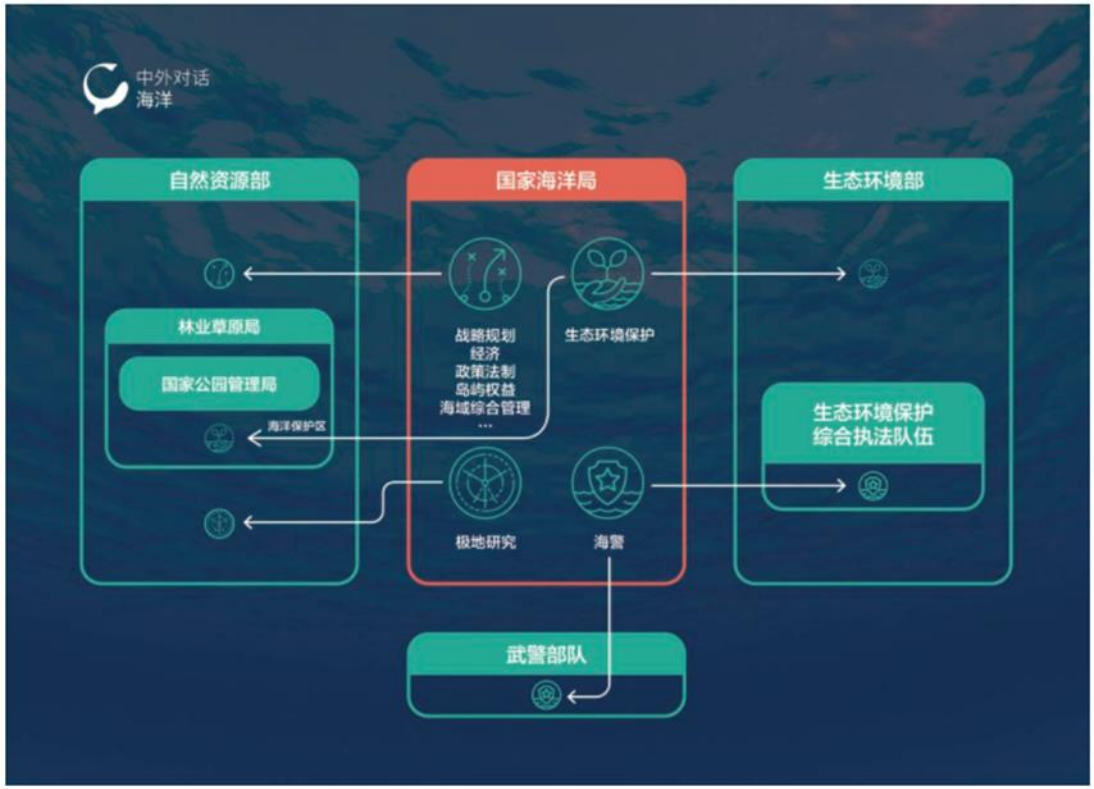
More critical habitats have been protected in YSLME region. More MPAs have been designated a
including Boh
national leve
15.45*10^5 h
number incre
20.66*10^5 h



- **Ministry reform**

China carried out institutional reforms in the State Council, and the pattern of marine environmental governance changed dramatically. The functions of the former State Oceanic Administration were absorbed into different ministries.

the main body being merged into the newly formed Ministry of Natural Resources, and the environmental protection functions are incorporated into the Ministry of Ecology and Environment. The
into the Armed Po



The establishment of the Ministry of Natural Resources, solved the problem of overlapping spatial planning. Since then, the designation of marine protected areas and the setting of marine ecological red lines, as the content of marine spatial planning, will be carried out under this new management pattern.

➢ MPA

The marine protected areas originally managed by the State Oceanic Administration mostly contain part of the coastal wetlands, and the wetlands are also under the jurisdiction of the former State Forestry Administration. Therefore, there are often two or more “management units” in the same space. This situation will change after that.

After the institutional reform, the newly established National Administration of Forestry and Grassland of the Ministry of Resources (developed on the basis of the former State Forestry Administration) will become the management unit of MPA.

➢ Marine pollution control

For a long time, China's marine pollution control has faced difficulties in cooperating with “land”. The root of the ocean problem is on land and has become a new slogan calling for a solution to the ocean problem.

The new Ministry of the Environment was formed on the basis of the former Ministry of Environmental Protection. In addition to all the functions of the Ministry of Environmental Protection, the department also included environmental protection functions in six other departments, including the State Oceanic Administration. Since then, the management channels for marine and land have been opened, and the governance of land-based pollution into the sea does not have to be coordinated across departments.

- **Public awareness raised**

YSLME BD Conservation plan in China

Basic principle:

- **Protection priority**
- **Sustainable use**
- **Land-sea coordination**
- **Public participation**

Objectives:

Make Yellow Sea more beautiful.

The effective time of this plan is from: 2018-2030.

Targets:

Short-term target(2018-2025)

Long-term target (2026-2030)

- Short term targets:

By 2025, efforts will be made to achieve basic control over the loss of biodiversity. The background survey and assessment of the yellow sea areas for biodiversity conservation is fully completed and effective monitoring is implemented. The nature reserve system with reasonable layout and complete functions is basically built. The national nature reserve has stable functions and the main protection objects are effectively protected. Biodiversity monitoring, assessment and early warning systems, entry and exit management systems for biological species resources, and access have been improved.

- Long-term targets:

By 2030, the number and size of various types of protected areas have reached a reasonable level, and ecosystems, species and genetic diversity have been effectively protected. Form a sound legal system for biodiversity conservation policies and sustainable use of biological resources, and protect biodiversity as a conscious action of the public.

Strategic tasks

- 1) Improve the policy and legal system for biodiversity conservation and sustainable use
- 2) Conduct biodiversity surveys, assessments and monitoring
- 3) Strengthening in situ conservation of biodiversity
- 4) Strengthening the safety management of invasive alien species
- 5) Construct a pollution control mechanism by the land and sea coordination
- 6) Improving the capacity to respond to climate change
- 7) Establish a public participation mechanism for biodiversity conservation

Improve the policy and legal system for biodiversity conservation and sustainable use

Actions 1,2

Action 1. Improve policies effectiveness to better conserve biodiversity and sustainable use

(1) Improve, and promote price, tax, trade, land use, and government procurement policy systems related to biodiversity conservation and sustainable use, and provide prices, credit, and taxation for biodiversity conservation and sustainable use projects.

(2) Improve ecological compensation policies, expand policy coverage, and increase capital investment.

(3) Formulate incentive policies that encourage the recycling of biological resources, and provide policy support for the development of alternatives to biological resources.

Action 2 Improve the legal system for biodiversity conservation and sustainable use

(1) Comprehensively review the contents of biodiversity protection in existing laws and regulations, adjust conflicts and inconsistencies between different laws and regulations, and improve the systemic and coordinated laws and regulations.

(2) Study and formulate laws and regulations on nature reserve management, wetland protection, genetic resource management and biodiversity impact assessment, and study and amend forest laws, wild plant protection regulations and urban greening regulations.

(3) Strengthen legislative work on invasion and biosafety of alien species, study and formulate laws and regulations on biosafety and management of invasive alien species, and study and revise regulations on the safety management of agricultural genetically modified organisms.

(4) Strengthen the construction of local law enforcement systems related to biodiversity laws and regulations.

Conduct biodiversity surveys, assessments and monitoring

Actions 3,4,5

Action 3 Conduct background survey of biological species resources and ecosystems

(1) Conduct comprehensive survey of biodiversity backgrounds in priority areas for biodiversity conservation.

(2) Conduct key species resource surveys for key areas and key species types.

(3) Establish a database of species background resources.

(4) Organize YSLME wildlife resources surveys and establish resource files and catalogues.

(5) Construction of a YSLME biodiversity information management system.

Action 4 Conduct biodiversity monitoring and early warning

(1) Establish a monitoring system for ecosystems and species resources, and promote the standardization and standardization of biodiversity monitoring.

(2) Strengthen the development and construction of modern equipment and facilities for monitoring ecosystems and different biological groups.

(3) Build a biodiversity monitoring network system, conduct systematic monitoring, and achieve data sharing.

(4) Develop biodiversity prediction and early warning models, establish early warning technology systems and emergency response mechanisms to achieve long-term and dynamic monitoring.

Action 5 Conduct a comprehensive biodiversity assessment

(1) Develop ecosystem service function and economic value assessment system for species resources, and carry out pilot demonstrations of economic value assessment of biodiversity in YSLME region.

(2) Evaluate the distribution pattern, change trend, protection status and existing problems of important ecosystems and biological groups, and issue comprehensive assessment reports on a regular basis.

(3) Establish and improve the endangered species assessment mechanism and regularly publish the YSLME Endangered Species List.

Strengthening in situ conservation of biodiversity

Actions 6,7,8,9,10

Action 6 Improve the biodiversity of YSLME wetlands

(1) Carry out general survey of wetland resources, and rescue natural rivers such as river beaches and coastal intertidal zones.

(2) Carry out ecological protection and restoration of degraded wetlands.

Increase the intensity of returning farmland to wetlands, returning fisheries to wetland, and mudflat culture ponds within the ecological red line must strictly implement the returning fishing to wetland regulation.

(3) According to the characteristics of different coastal wetlands, the suitable wetland plant species should be planted according to local conditions to enhance the stability of wetland ecosystems.

Action 7 Strengthen the conservation of endemic aquatic germplasm resources in the oceans and estuaries

(1) Strengthen investigation, monitoring and research on marine and estuarine endemic species protection areas,

Comprehensive survey and evaluation of fishery resources in the protected areas to protect the germplasm of endemic aquatic organisms.

Establish a monitoring network for aquatic resources around protected areas.

(2) According to the Law of the People's Republic of China on the Protection of Wild Animals And the National Aquatic Wildlife Protection Regulations, establish special protection and conservation work programs for The first and second levels of the National protected aquatic animals, like : Chinese sturgeon, finless porpoise, etc.

(3) Strictly control the total number of fishing vessels and horsepower, and gradually reduce the number of fishermen and fishing boats.

Reduce the fishing intensity, strictly enforce the fishing off policy and

improve the life guarantee system for fishermen during the fishing-off season; carry out artificial proliferation and release and ocean

artificial reefs to alleviate the decline of fishery resources and protect marine life.

(4) Implement the ecological compensation system for marine engineering projects.

(5) Strengthen the protection of habitats and breeding sites of endemic biological resources, and gradually establish key products.

Action 8 Strengthen the conservation on YSLME biodiversity priority area

(1) Conduct assessment of the relevance of existing zoning schemes to connectivity of existing MPAs and/or potential MPAs.

(2) Propose new MPA according to gap analysis.

(3) Identifying the BD priority of YS, draw the map of priority areas for designation as conservation areas in YS and identify opportunities for improvements in connectivity with existing and new MPAs.

Action 9 Improvement of YSLME MPA planning and management

(1) Coordinate the implementation of the development plan of MPAs and establish an information management system.

(2) Strengthen the construction of MPAs in the priority areas of biodiversity conservation, optimize the spatial layout, and improve the connectivity and overall protection capacity.

Action10 Promote fish spawning and habitat restoration and reconstruction

(1) Fish spawning and habitat restoration and reconstruction. Identify key areas for fish spawning grounds and habitat restoration and reconstruction, and prepare fish spawning grounds and habitats for ecological remediation and reconstruction plan to achieve biodiversity restoration in key areas.

(2) Further increase the diversity of artificial reef types, improve the effectiveness of proliferation and release, rebuild fish spawning grounds and habitat environment, and restore biodiversity.

(3) Standardize the management of spawning grounds and habitat areas. In the key areas, any form of development, coastal engineering, and illegal sand mining are prohibited to protect fish spawning grounds and habitats from damage. Establish a dynamic monitoring system for fish spawning grounds and habitats. Standardize fishing equipment during fishing activities.

Strengthening the safety management of invasive alien species

Action:11

Action 11 Strengthen the invasive species control

(1) Strengthen the broadcast and management of alien species hazards. Improve the ecological security awareness of the whole society against biological invasion. Carry out various forms of publicity ways to improve residents' awareness of alien species and jointly resist invasive alien species.

(2) Investigate data on the species, quantity and distribution of invasive species for ecological damage. Assessment of invasive species such as Spartina alterniflora, which has a high degree of damage and rapid spread. Accelerate the research on invasive species control.

(3) Establish risk assessment of alien species. Prevention and assessment are prerequisites for risk management of alien species and should be established.

(4) The integrated management mechanism of invasive alien species builds a comprehensive prevention and control system for the prevention and control of invasive alien species. Take timely early warning and emergency measures, and use effective prevention and control measures to strengthen the prevention and control of invasive alien species.

Construct a pollution control mechanism by the land and sea coordination

Actions 12,13

Action 12 Strengthen the control of ecological red line areas

(1) Strictly implement the redline area management regulation.

DPZ management measure

In nature reserve DPZ, no construction of production facilities was allowed. No organization or individual is allowed to entry without special reason. In marine special protected area, the important protected area prohibits any construction project not related to protected area. In reserve area, human disturbance is strictly controlled, no constructions allowed here. Any production activities that might change the natural ecological condition will be prohibited.

Action 13 Strengthen seawater and estuary pollutant discharge control and supervision

(1) Strengthen the supervision of pollution from land to sea, in accordance with the “watershed – nearshore waters – red line region” hierarchical system to strengthen pollution monitoring and management of rivers entering the sea, comprehensively ban the illegal or unreasonable land-source discharge into the sea.

(2) Strictly control marine pollution discharge and strengthen the protection of germplasm resources and their neighbors

Pollution control of regional ports, terminals, loading and unloading stations and ships, ports, terminals, loading and unloading stations

It should have pollutants receiving and disposing facilities, anti-pollution emergency facilities and equipment, and strengthen the ship

Receiving and disposing of pollutants such as waste oil, sewage oil, washing water, domestic sewage, garbage and waste gas should have strict supervision and inspection. Illegal discharge is strictly prohibited.

Improving the capacity to respond to climate change

Action 14

Action 14 Develop action plan for YSLME biodiversity conservation to address climate change

(1) Develop an action plan for biodiversity conservation to address climate change. Assess the impact of climate change on important ecosystems, species, genetic resources and related traditional knowledge in YSLME, and propose relevant countermeasures.

(2) Develop monitoring technologies for the impacts of climate change on biodiversity, build monitoring networks, and carry out key monitoring.

(3) Constructing species migration corridors to reduce the negative impacts of climate change on biodiversity; cultivating new varieties of good animals and plants and enhancing their ability to adapt to climate change.

Establish a public participation mechanism for biodiversity conservation

Action 15

Action 15 Improve public education on biodiversity conservation

(1) Carry out biodiversity conservation education, disseminate ecological culture, ecological health, and ecological environment knowledge. The awareness of promoting the concept of biodiversity protection of the citizens.

(2) Carry out publicity and education on biodiversity conservation for government.

(3) Carry out publicity and education on biodiversity conservation in educational institutions such as schools.

(4) Integrating biodiversity conservation culture knowledge education into kindergartens, primary and secondary schools, and colleges and universities, in order to deepen the students' awareness of biodiversity conservation.

(5) Carry out publicity and education on multimedia biodiversity conservation. Promote the importance and main measures of biodiversity conservation through public service advertisements.

To improve the level of biodiversity protection and responsibility of citizens; make full use of magazines and newspapers, radio and television, Internet, WeChat public account, etc.

Thank you!