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## FOREWORDS

WWF Japan is a member of the global network of WWF, one of the largest and independent conservation NGOs in the world. We have been working on the conservation of coastal ecosystems in Japan for more than 15 years, along various places such as tidal flats of the Ariake Sea.

WWF Japan jointly started the Yellow Sea Ecoregion Initiative in 2000 with wetland conservation groups in China and the Republic of Korea, following WWF Network's nomination of the Yellow Sea in the list of the Global 200 Ecoregions in late 1990's. The conservation of coastal wetlands in the Yellow Sea Ecoregion is a key issue for the conservation of migratory waterbirds, which are also the important flagship species of the coastal ecosystems in Japan.

This initiative had successfully compiled and published a set of reconnaissance reports on the current status of wetland and marine biodiversity in China and the Republic of Korea in 2001. With the level of information compiled in the reports, WWF Japan was confident that the science-based conservation prioritisation for the Yellow Sea Ecoregion was a real possibility. At the same time, we recognised another concern of the fisheries products from the Yellow Sea Ecoregion; heavy imports of certain fisheries products to Japan may have impacts on the sustainability of fisheries, thus subsequently on the biodiversity in the Yellow Sea Ecoregion.

In 2002, in order to scale up this initiative further to take actions on those issues, WWF Japan proposed to apply the Ecoregion conservation planning methodology to the Yellow Sea Ecoregion and this resulted in the formation of the Yellow Sea Ecoregion Planning Programme (YSEPP) project. The following partnership was organized accordingly to implement YSEPP: WWF China (China), KORDI and KEI (the Republic of Korea), and WWF Japan (Japan) and we committed to provide core funding, one full-time staff as the regional project coordinator, and the technical support based on our previous experiences in Japan

Thanks to the intensive contributions by the scientific experts, as well as YSEPP partners, the project successfully completed here its biological assessment and the priority area analysis. The members of YSEPP Steering Committee concluded that the project highlights were: 1) Ecosystem-scale, multi-disciplinary, science-based and international (China, Korea, and Japan) biodiversity assessment of Yellow Sea Ecoregion completed; and 2) A Memorandum of Understanding (MoU) with the UNDP/GEF Yellow Sea Large Marine Ecosystem (YSLME) project signed.

WWF Japan strongly hopes that this scientific knowledge, especially the Yellow Sea Ecoregion Potential Priority Area Map, will actively be integrated into the biodiversity conservation policies of China and Korea, and will help to achieve regionally coordinated conservation of these critical habitats. We also hope to carry on strengthening our three-country conservation cooperation with organisations in China and Korea, to catalyse conservation actions in the field.

HIGUCHI, Takamasa  
Chief Executive Officer,  
WWF Japan

The Yellow Sea Ecoregion (YSE) is recognized by WWF as the best representative ecoregion of the temperate Pacific in terms of coastal and marine biodiversity. This ecoregion, shared by China and the two Koreas, has been providing life-sustaining ecosystem services for both coastal and inland residents for thousands of years. Unfortunately, YSE is also one of the most heavily exploited and disturbed marine regions in the world.

To reverse the trend of continuous biodiversity loss and decline in the quality of ecosystem services, an indispensable step is to inform all stakeholders of the locations of the critical natural habitats in YSE. In response to this need, WWF China Programme Office (WWF China), in partnership with WWF Japan, Korea Ocean Research and Development Institute (KORDI), and Korean Environment Institute (KEI), launched the Yellow Sea Ecoregion Planning Programme (YSEPP) in 2002. Through over four years' effort, scientists from China, Republic of Korea, and Japan identified 23 Potential Priority Areas (PPAs) by studying and analyzing the needs of six taxonomic groups, namely marine mammals, birds, fish, mollusks, coastal plants, and algae. YSEPP is now publishing one of its most important products—Biological Assessment Report (BAR). BAR contains comprehensive information and data, which ranges from biology to key habitats to economic value of the most important species (indicator species) selected from the six groups. Such an interdisciplinary, comprehensive, and trans-boundary assessment is unprecedented in YSE conservation. We believe as a scientific reference, BAR is at least as valuable as the PPAs map, if not more so, for decision makers and other key stakeholders such as the UNDP/GEF Yellow Sea Large Marine Ecosystem Project team.

Science has showed that by focusing limited conservation resources on the 23 PPAs, the integrity of YSE's biodiversity can be maintained, industries such as fishery and mariculture can be made more sustainable and aesthetic and spiritual value can be better preserved. However, the route to reach the expected results is neither an easy, nor a short one: Significant amount of resources have to be allocated, difficult trade-offs have to be made among varied sectors and industries, all key stakeholders from governments to business groups to civil societies have to be engaged, and coordinated actions often with a trans-boundary nature have to be taken.

WWF China and its partners regard the completion of BAR and the PPA map as the very first step toward a healthy YSE. We acknowledge that neither BAR nor the PPA map is impeccable due largely to the existence of information gaps. However, as the products of the state of the art science, they can lay out a sound groundwork for more comprehensive planning process to be built upon; they will also serve as guidance for interested parties to prepare coordinated conservation strategies and take effective actions.

Dermot O'Gorman  
Country Representative,  
WWF China

Korea's rapid industrialization and urban development undeniably brought the country unprecedented economic prosperity and upgrading in people's quality of life. These advances were achieved at the same time at the expense of our nature. Continuing environmental degradation not only threatens the material basis of our society but it will ultimately harm the health of mentality of our next generations.

The Korea Ocean Research and Development Institute (KORDI), Korea's leading center of oceanography, had accumulated knowledge and experience of over thirty years. Among the ample signs we have observed in our seas and coasts, the serious changes taken place in the Yellow Sea have important implications. Improvement in marine environment requires more fundamental and systematic solutions, by shifting focus to ecosystem-level conservation and engagement of a wider range of stakeholders. It also requires international cooperation with neighboring countries. After all, the Yellow Sea is a shared sea involving multiple users and polluters and it can never be managed with single efforts.

In line with this, the Yellow Sea Ecoregion Planning Programme (YSEPP) played a meaningful role as a platform for promoting cooperation among the three countries and bridging different stakeholders. KORDI, with WWF Japan, WWF China, and KEI, put much effort in networking eminent scientific experts and gathering consensus. The Biological Assessment Report is one of the outcomes of YSEPP. The approach adopted here is particularly significant in that it tried comprehensive analysis by taxonomic groups and standardized integration of information of both Korea and China. The quality and quantity gaps of information among the countries and the taxonomic groups were the greatest challenge that renders the limitation of this report apparent yet, with best available information, we regard that it is still worthwhile benefiting both scientific communities and public in knowing the Yellow Sea.

Based upon the results of YSEPP, a second phase project is soon to be launched that will extend out of the domain of science and directly work with coastal communities and public for promoting the region's conservation. For the successful implementation, we appreciate readers to give back comments and advices. KORDI hopes that the vision for protecting our nature and further the health of our society will be realized through the project and learnings from it.

Finally, KORDI wish to acknowledge the authors, reviewers, editors and all who made great contributions to the publication of the report.

KANG, Jung-Keuk

President

Korea Ocean Research and Development Institute

The Yellow Sea Ecoregion is one of the world's largest areas of continental shelf and provides a variety of seafood, recreational opportunity and wildlife habitat. Unfortunately, the Ecoregion is facing serious environmental problems, many of which come from insufficient knowledge of marine ecosystem and human disturbances such as reclamation, over-harvest.

In the late 1990s, WWF Network designated the Yellow Sea as one of the Global 2000 Eco-regions, then Yellow Sea Eco-region Planning Programme (YSEPP) was jointly launched by WWF, Korea Ocean Research & Development Institute (KORDI) and Korea Environment Institute (KEI) to develop the potential priority area map. KEI supports the integrated management strategies in YSEPP, and coordinates the different views among biological and socio-economic experts from China, Japan, and Korea. In order to preserve the fragile ecosystem, ecologically important areas and target species should be identified on the basis of scientific data under the in-depth discussion of multi-disciplinary scientists.

This biological assessment and the priority area analysis, based on the YSEPP, would be the important first step to conserve natural resources and achieve sustainable use of the Yellow Sea. We hope that this publication is useful for the policy to China and Korea, and that these two countries will use the priority areas to establish marine protected areas. KEI will make help continuous research activities to conserve the marine and coastal ecosystems of the Yellow Sea.

PARK, Tae-Joo

President

Korea Environment Institute

## ACKNOWLEDGEMENTS

The scientific reports of the Yellow Sea Ecoregion Planning Programme, the Biological Assessment report and Priority Area Analysis report, are the results of extensive consultations and collective efforts of experts who contributed so generously to this process of finding conservation priorities for biodiversity conservation of the Yellow Sea Ecoregion. Only with such generosity and dedication of those who participated in the process, it became possible to complete this ecosystem scale, multi-disciplinary, science-based and international (China, Korea, and Japan) biodiversity assessment of the Yellow Sea Ecoregion.

The Yellow Sea Ecoregion Planning Programme was initiated in 2002 and the implementing organisations of this international project, WWF Japan, WWF China, Korea Ocean Research and Development Institute (KORDI), and KEI (Korea Environment Institute) would like to express deepest appreciation to all the contributors to this multi-year project. WWF Japan provided the core funding to the project, which enabled the project to establish the Planning Team with country coordinators for China, South Korea and one coordinator for the Ecoregion. KORDI and WWF China provided institutional support to country coordinators in China and South Korea and KEI gave financial support as well as logistical support to host one of the key workshops.

Authors of the Biological Assessment papers are especially thanked for their generous contributions on numerous occasions throughout the analytical process of the project. The Biological Assessment was a challenging task as it attempted to summarise and map out as much spatial information as possibly available on ecologically important places for indicator species of biodiversity importance in the Yellow Sea Ecoregion, and the project owes much of its success to the comprehensiveness of the assessment by the authors. Following authors generously dedicated their knowledge, time and effort in writing and revising the Biological Assessment papers:

ZHU Qian, MA Zhijun, JIN Xianshi, LI Baoquan, LI Xinzheng, YAN Luo, DING Lanping, WON Changman, KIM Zanggeun, KIM Jinhan, PAE Seonghwan, YEON Inja, HWANG Hakjin, SOHN Myounggho, IM Yangjae, MYOUNG Junggoo, SHIN Sangho, JE Jonggeel, MIN Byeongmee, CHOI Hangil, SHIRAKIHARA Kunio

In addition, following experts are acknowledged for their contributions to the project by providing overview of socio-economic status of the marine and coastal ecosystem and its conservation in the form of assessment papers as well as presentations in the early stage of the Biological Assessment:

CAO Zhongxiang, LEE Changhee, PYO Heedong, IZAWA Arata

As a first step in the Biological Assessment of biodiversity of the Yellow Sea Ecoregion, the Preparatory Workshop for the Yellow Sea Ecoregion Biodiversity Vision, was organised in May, 2004 and following invited participants contributed to the assessment by either making a presentation on the overview of biodiversity on a particular taxonomic group, or a presentation on the current policies and projects to conserve marine and coastal biodiversity, and/or participated in a discussion to develop a set of common criteria for selecting indicator species and ecologically important areas:

ZHU Qian, MA Zhijun, JIN Xianshi, DING Lanping, WEI Hongyu, CAO Zhongxiang, CHEN Liwei, XIAO Hong, QI Ping, PEI Xiangbin, WON Changman, KIM Zanggeun, KIM Jinhan, MYONG Junggoo, SOHN Myounggho, Kim Youngseop, PARK Jonghwa, JE Jonggeel, KIM Ilhoe, MIN Byeongmee, CHOI Hangeel, RHO Paikho,

LEE Changhee, PYO Heedong, PAE Seonghwan, JUNG Sangyoon, YOON Boondo, JEONG Gyongyoon, SHIRAKIHARA Kunio, IZAWA Arata, TOBAI Sadayosi, BYUN Sangkyung, YOON Suhsung, Jim HARKNESS, KIYONO Hisako, SATO Tetsu, MIZUNO Toshiaki

The workshop was kindly sponsored by the Ministry of Maritime Affairs and Fisheries and the Ministry of Environment of South Korea.

Staff members of KORDI and KEI whose names are not listed here are also thanked for supporting the logistic arrangements of this workshop.

As a follow up to the preparatory workshop, national workshops were organised in August and September respectively in China and in South Korea in 2004. Most of the authors of the Biological Assessment papers participated in the workshops and they contributed to further improve the common criteria for the Biological Assessment.

The International Workshop for the Yellow Sea Ecoregion Biodiversity Vision, which was held on April 16-18th, 2005 in Qingdao, China, was the last step to prioritise significant habitats and species for biodiversity conservation. Following experts in China, Korea, and Japan, together with other international experts on biodiversity conservation took part in the workshop and they worked collaboratively on a regional scale as well as in a multi-disciplinary way, and identified ecologically important areas by taxonomic as well as Potential Priority Areas for biodiversity conservation of Yellow Sea Ecoregion.

ZHU Qian, MA Zhijun, JIN Xianshi, DING Lanping, XING Junwu, LI Xinzhen, CHEN Shang, WANG Zongling, LI Ruixiang, Zhu Mingyuan, WEI Hongyu, ZOU Xinqing, YANG Qin, WANG Yamin, JE Jonggeel, WON Changman, KIM Zanggeun, KIM Jinhan, MYONG Junggoo, YEON Inja, SHIN Sangho, MIN Byeongmee, CHOI Hangil, LEE Yoon, OH Junghee, CHO Wooik, LEE Changhee, PAE Seonghwan, YOO Sinjae, RHO Paikho, SHIRAKIHARA Kunio, TOBAI Sadayosi, OKAYASU Naobi, JIANG Yihang, Jeff ARCHER, LEE Sam Y. S, Doug WATKINS, Anna van PADDENBURG, Mark BARTER, Ghislaine LLEWELLYN, CAO Lei

The workshop was co-organised by WWF, First Institute of Oceanography, KORDI and KEI, National Fisheries Research and Development Institute (NFRDI), The 21st Century COE Program of the University of Tokyo "Biodiversity and Ecosystem Restoration Research Project". The Joint Session on Biodiversity Conservation of the Yellow Sea during the workshop was co-organised by the WWF/KORDI/KEI Yellow Sea Ecoregion Planning Programme and the Regional Thematic Working Group on Biodiversity of the UNDP/GEF Yellow Sea Project. This session enabled even wider collaboration between the two projects with very similar objectives.

Following reviewers and editors of the publication, the Biological Assessment of the Yellow Sea Ecoregion, are acknowledged and thanked for their cooperation and effort to improve the knowledge in the Biological Assessment report.

OKAYASU Naobi, Mark BARTER, PAE Seonghwa, JIN Xianshi, KIM Sooam, SHIRAKIHARA Kunio, FANG Jianguang, RYU Jongseong, ZHAO Kefu, LEE Jeomsook, XIA Bangmei, YOO Sinjae, KIM Woongseo, LEE Changhee, JIANG Yihang, WANG Songlin, TOBAI Sadayosi, CHOI Youngrae

Mapping areas that are critical for biodiversity conservation was a key process in this project. The project



found that most of spatial information has not been digitised yet, and GIS specialists took on the enormous task of digitising a very large number of paper maps into the GIS. The GIS specialists also worked in an extremely demanding condition during the biodiversity vision workshop and thanks to their hard work, mapping results for discussion were provided in time daily in the workshop.

Sundosoftware of South Korea merits a special acknowledgement for their extremely generous support to the GIS operation of the project. They provided their GIS specialists free of charge for a long period of time during the project including but not limited to the following occasions, the preparatory workshop, the Korea national workshop, the biodiversity vision workshop, and in subsequent editing and finalisation process of the GIS maps. Oh Junghee of Sundosoftware, in particular, is deeply thanked for his dedication and patience with this very challenging GIS process. The following GIS experts also supported the GIS operation of the project:

OH Junghee, CHO Wooik, RHO Paikho, WEI Hongyu, Anna van PADDENBURG, PARK Chungsun, CHOI Hyunwoo

Staff members of UNDP Korea and the Project Management Office for the UNDP/GEF Yellow Sea Large Marine Ecosystem Project provided support to the project by encouraging closer and complimentary cooperation with the UNDP/GEF Yellow Sea project. In particular, Anne-Isabelle Degryse-Blateau, Representative of UNDP Korea and Jiang Yihang, Project Manager of the UNDP/GEF Yellow Sea Project kindly gave strategic advice since early stage of their project as well as encouraged experts in their project to work with the YSEPP.

The Members of the Steering Committee and the Strategic Advisory Group of the Yellow Sea Ecoregion Planning Programme provided strategic guidance to the Planning Team of the project and continuously supported fundraising effort by the Ecoregion Coordinator. Amongst the advisory group members, Sato Tetsu of WWF Japan was instrumental in launching the project and Okayasu Naobi of WWF Japan supported the project by serving as chair of the advisory group at a critical time of transition from this project to the next phase, and Kiyono Hisako also supported as an interim member. At KORDI, Je Jongeel greatly assisted in an initial stage to host a country coordinator at KORDI as well as to enlist support from Korean experts, Yoo Sinjae provided critical review of the assessment process, and Yum Kidai, Kang Jungkeuk as President of KORDI and Huh Sik gave institutional support. Lee Changhee of KEI supported the project by acting as a focal point for KEI as well as providing his expertise on environmental policies and Jeong Hoiseong, Park Taejoo as President of KEI gave institutional support. Zou Xinqing of WWF China joined at a critical last stage and he supported the project by playing two roles as an advisory group member as well as a coordinator and Jim Harkness of WWF China gave institutional support. Sam Lee of WWF Hong Kong gave useful advice as well as technical support in a workshop and Craig Kirkpatrick of TRAFFIC East Asia assisted to develop a trade-based assessment of threats to biodiversity of the Yellow Sea Ecoregion. Chen Kelin and Doug Watkins of Wetlands International and Mark Barter generously shared their knowledge and experience on waterbirds and wetland conservation to implement this project. Isabelle Louis of WWF International gave useful advice on institutional management of the project.

Pae Seonghwan of KORDI and Chen Liwei of WWF China, who were initial members of the Planning Team and the country coordinators for South Korea and China respectively, took on a challenging task of building a foundation for this international and multi-disciplinary assessment, which has not been done by others in the region before. They worked hard with great enthusiasm and for long hours before and after each step of the

assessment. The Ecoregion Coordinator gratefully acknowledges their efforts and achievements. In addition to country coordinators, Zou Xinqing and Yang Qin of WWF China played vital roles to ensure continuation of the project in China and their efforts are equally acknowledged as part of the Planning Team.

Wang Songlin of WWF China and Choi Youngrae of KORDI worked as editing coordinators for scientific reports of the YSEPP project, and their dedication to work closely with the Biological Assessment paper authors greatly contributed to these publications.

This publication has been made possible in part by funding from WWF, KORDI, KEI, and YSLME.

All affiliations are at the time of their involvement in the project.

On behalf of the implementing organisations of the YSEPP,  
Tobai Sadayosi  
Ecoregion Coordinator,  
The Yellow Sea Ecoregion Planning Programme