

# Executive summary

The GIWA Sea of Okhotsk region comprises the Okhotsk Sea and its surrounding catchments, the largest of which, by far, is the Amur River Basin – a transboundary basin shared between China, Mongolia, Russia and North Korea. Other basins draining into the Okhotsk Sea include those of the Khabarovskiy Kray, Magadanskaya and Kamchatskaya oblasts in Russia.

For the purpose of this report, the Sea of Okhotsk region can be divided into two sub-systems: the Okhotsk Sea (marine) and the Amur River Basin (freshwater).

The Okhotsk Sea sub-system has an area of approximately 1.6 million km<sup>2</sup> and a coastline 10 460 km in length. More than 95% of the coast of the Sea lies within Russian territory, with Hokkaido Island (Japan) accounting for the remainder. The Sea contains over 50% of the Russian Far East's bio-resources and is regarded as the richest fishery region in the world, with approximately 340 fish species. Its continental shelves are rich in hydrocarbon resources. Although the majority of the Sea is within Russia's exclusive economic zone (EEZ), its centre is high seas (neutral zone), and its southeastern part, adjacent to Hokkaido Island, lies within Japanese territorial waters. The Sea's coast is generally characterised by mountainous relief which demarks the watershed – a narrow land belt 100-150 km wide.

The sub-system Amur River Basin – known in China as the Heilong Jiang – is one of the largest river systems in Asia, covering about 2 million km<sup>2</sup>. The River is one of the ten longest in the world (approximately 4 345 km) and its course forms the boundary between Russia and China for 3 000 km. The average annual discharge of the Amur River is 369 km<sup>3</sup>. The Amur River Basin hosts some of the world's most diverse and productive habitats and encompasses extensive areas of complex

and unique ecosystems. The River supports more fish species than any other Russian river, with more than 120 species, 18 of which are endemic and eight endangered. The Basin's territory is socially, politically and economically diverse, with varying development patterns. These differences can be an obstacle to international cooperation in the Basin.

The population of the Okhotsk Sea sub-system is approximately 8.7 million, of which 2.7 million live in Russia and about 6 million in Japan. The Russian coast, except for Sakhalin Island, is sparsely populated, with a population density of approximately 1.5 people per km<sup>2</sup>. The population of the Amur River Basin sub-system fluctuates between 70 and 80 million people, 5 million of whom live in Russia, 65-75 million in China and less than 50 000 in Mongolia. The North Korean part of the Basin is largely unpopulated. The Basin's average population density is 35 people/km<sup>2</sup>, though 105 people/km<sup>2</sup> in the catchment of the Songhua River (a tributary of the Amur River in China) which includes large cities such as Harbin, Jilin and Mudanjiang.

This report presents the results of the UNEP/Global International Waters Assessment for the Sea of Okhotsk region (GIWA region 30). It is based on the outputs of three workshops, conducted in Vladivostok, Russia, in 2001, 2003 and 2004 respectively. The Task team consisted of local experts with various specialist backgrounds regarding environmental and socio-economic impact assessments in the Sea of Okhotsk region. The results are the consensus of the team and other participants of the workshops (see Annex I) and are substantiated using data obtained from a number of sources, including international and national programmes and projects operating within the region. For the Amur River Basin sub-system, this report assesses only the Russian territory and two of the riparian provinces of China (Heilongjiang and Jilin).

During the Scaling and scoping workshop, the experts prioritised the GIWA major concerns in the following rank order:

- 1 Pollution
- 2 Unsustainable exploitation of fish and other living resources
- 3 Freshwater shortage
- 4 Habitat and community modification
- 5 Global change

The priority concerns were identified as Pollution, specifically the issue of eutrophication (for the Amur River Basin sub-system) and oil spills (for Okhotsk Sea sub-system), and the Unsustainable exploitation of fish and other living resources (for the whole Sea of Okhotsk region).

In the Okhotsk Sea sub-system, oil and gas exploitation provides economic benefits for the region but discharges significant quantities of wastewater as by-products of drilling operations. Although only three major oil spills have occurred in the region since the 1990s, the future expansion of the oil industry in the region will increase the risk of spills. In the Amur River Basin, eutrophication has been attributed to nutrient enrichment caused by the discharge of domestic wastewater and surface run-off from the catchment area. It is expected to increase in severity over the next 20 years, with the communities of the lower Amur River Basin and Songhua River Basin experiencing the greatest socio-economic impacts. A significant proportion of chemical pollution originates from pesticides used in the agricultural sector, as well as heavy metals released by other human activities.

Over the past 15 years, total fish catches in the Sea of Okhotsk have drastically reduced. Catches of pollock – the major commercial species in the Okhotsk Sea sub-system – have decreased significantly, though estimating total catches is extremely difficult. In the Amur River Basin sub-system, stocks of salmon and sturgeon have declined as a result of overfishing and the degradation of spawning habitats. The problem is exacerbated by inappropriate fishing practices as well as adverse natural conditions. It is expected that salmon will continue to be overfished for the foreseeable future.

The concern of Habitat and community modification was assessed as having a slight impact. In the Okhotsk Sea, human activities have altered the habitats of pollock, Humpback whale and the endangered Gray whale, among other species. Whales are threatened by the increasing exploration and extraction of marine oil and gas reserves. Habitat and community modification is expected to increase in severity in the future due to further oil and gas development, which will also necessitate the development of bulk-oil complexes and harbours for large tankers. In the Amur River Basin, the extent of wetlands has declined in both Russia

and China, threatening biological diversity and endangered species in the Basin, notably several migratory bird species.

The immediate causes of eutrophication in the Amur River Basin sub-system were identified as the considerable quantities of organic matter and biogenic material in domestic and industrial wastewaters and surface run-off. Run-off of fertilisers from agricultural areas also stimulates eutrophication. The sectors responsible for eutrophication were identified as industry, urbanisation, agriculture and aquaculture. Oil development on the Russian Sakhalin shelf has increased the intensity of oil-related marine traffic transiting the Okhotsk Sea. Although there have been relatively few incidents to date, there is always a risk of a spill through deliberate or accidental discharges. Oil is also discharged by the numerous fishing vessels operating on the Sea. Overfishing is affecting the ecosystems of the Sea of Okhotsk region. Fish catches have declined by one-third due to depleted fish stocks. The main cause of the stock depletion is overexploitation where the Total Allowable Catches (TACs) of Russia are exceeded by 2 to 10 times.

In the future, these aquatic concerns will remain the most significant anthropogenic threats to the region. Mitigatory actions should include: waste control and treatment in the Amur River Basin sub-system; the prevention of oil spills and the development of emergency response measures; and sustainable fisheries management.

In the Amur River Basin sub-system, there are a number of institutional weaknesses which are either promoting or failing to prevent transboundary pollution. While there is limited basin-wide cooperation, there is recognition of the need to work together to address transboundary issues. There is limited stakeholder involvement in the decision-making process and public awareness of pollution issues is rather rudimentary. A major hindrance for policy-makers when setting priorities for remediation is the lack of knowledge of the ecological characteristics and their reaction to human activities. A technical problem is the poor condition of wastewater treatment infrastructure.

In the Sea of Okhotsk region, overcapacity of the fishing fleet is a major factor in the overexploitation of the region's commercial stocks. The introduction of auctions of fish quota-rights, in addition to a burdensome tax system, has reduced the profitability of the fisheries, resulting in fishermen undertaking poaching and illegal fishing to supply a black market for fish products. Regional cooperation in combating illegal fishing is limited and national laws and regulations are undermined by deep-rooted corruption and weak enforcement. There is a lack of fisheries statistics and monitoring programmes, and fishermen lack awareness of the long-term impacts of overfishing.

Oil spills in the Okhotsk sub-system were considered to be a considerable future threat because, although there has been rather limited oil contamination to date, the extensive oil and gas development, particularly on the continental shelf of Sakhalin (Russia), and increased shipment of oil across the Sea, will significantly increase the risk of spills. While there has been considerable effort in rapidly developing the oil and gas industry in the region, progress in establishing emergency contingency plans was considered unsatisfactory.

The Policy options recommended to address the water-related problems of the Sea of Okhotsk region are based on the policies adopted at the United Nations Conference on Environment and Development (UNCED) and the World Summit on Sustainable Development (WSSD). Russian environmental and development legislation was also considered during their formulation. The measures discussed in the conclusions and recommendations of this report not only aim to preserve and rehabilitate aquatic ecosystems in the region, but also to prevent future eutrophication, oil spills and overexploitation of fish resources.