Tam Giang-Cau Hai Proposed Marine Protected Area

Alternative site name(s)
Tam Giang
Province(s)
Thua Thien Hue
Status
Proposed
Management board established
No
Latitude
$16^0$17' - $16^0$40'N
Longitude
$107^0$25' - $107^0$57'E
Bio-unit
05c - North Annam

Conservation status

Tam Giang-Cau Hai proposed marine protected area is centred on the Tam Giang-Cau Hai lagoon complex, which lies in the coastal zone of central Vietnam. Administratively, the lagoon complex lies in Phu Loc, Phu Vang, Huong Tra, Quang Dien and Phong Dien districts, Thua Thien Hue province. Tam Giang-Cau Hai was included on a list of 16 proposed marine protected areas compiled on behalf of MOSTE in 1998. On this list, the area of the proposed marine protected area was given as 24,876 ha (Nguyen Chu Hoi *et al.* eds. 1998). The proposal to establish a marine protected area at Tam Giang-Cau Hai was reiterated by the Asian Development Bank (ADB 1999) in their marine and coastal protected areas systems plan for Vietnam. In the ADB proposal, the area of the proposed marine protected area was again given as 24,876 ha, comprised entirely of the marine component.

Thua Thien Hue Provincial Department of Science, Technology and the Environment have nominated the Tam Giang-Cau Hai lagoon complex as a Ramsar Site (ADB 1999). The recommendation to designate Tam Giang-Cau Hai as a Ramsar Site was reiterated by Nguyen Chu Hoi *et al.* eds. (1998).

In 1997, Hai Phong Institute of Oceanography, on behalf of the provincial department of science, technology and the environment, prepared a proposal to establish a national wetland protected area at Tam Giang-Cau Hai (Tran Duc Thanh *et al.* 1997). The total area of the wetland protected area defined in this proposal is 4,189 ha, comprising a core zone of 1,286 ha and a buffer zone of 2,921 ha. As there is, as yet, no specific institutional framework under which a wetland protected area can be established, it is unclear whether, in the future, Tam Giang-Cau Hai will be established as a Special-use Forest, a marine protected area or a wetland protected area of a yet-to-be defined nature.

Topography and hydrology

The Tam Giang-Cau Hai lagoon complex comprises a series of coastal lagoons, situated to the north and east of Hue city. The largest lagoon is Cau Hai, in the south-east of the site. This lagoon is connected to the sea via the Tu Hien channel. To the north-west are three more lagoons, none of which is connected to the sea directly. The north-westernmost lagoons, Tam Giang and Thanh Lam, open into the Huong river, which flows into the sea via the Thuan An channel. The third lagoon, Thuy Tu, connects Thanh Lam and Cau Hai lagoons. The lagoons are separated from the sea by a large sand dune system.

Strong waves and tides, together with patterns of siltation and sedimentation mean that the the morphology and topography of the lagoons are highly dynamic. These forces can have major socio-economic implications, as some lagoons fill with sediment, whilst others move, threatening roads, irrigation systems and other infrastructure (La Van Hoang 1998).

Biodiversity value

Information on the biodiversity of the lagoons is incomplete, as the site is yet to be fully surveyed and documented. However, it is known that the Tam Giang-Cau Hai lagoon complex supports a range of wetland habitat types, which can be classified into four groups: vegetated wetlands, which mainly comprise marshland; non-vegetated wetlands, which comprise mudflats and sand flats; permanently submerged wetlands, some of which support seagrass; and man-made wetlands, comprising aquacultural ponds. To date, 223 species of fish have been recorded in the lagoons, including one endemic species, *Cyprinus centralis* (Tran Duc Thanh *et al.* 1997).

Tran Duc Thanh *et al.* (1998) highlight the importance of the area for large numbers of migratory waterfowls that use the lagoons in winter: they report numbers of waterfowl (ducks and geese) reaching 20,000. Observations in January 2000 indicated the presence of large numbers of Spot-billed Duck *Anas poecilorhyncha* and Greylag Goose *Anser anser* (R. Hughes pers. comm.). ADB (1999) also report that the globally near-threatened Asian Dowitcher *Limnodromus semipalmatus* has been recorded at the site. Further survey work is required to elucidate the precise importance of the lagoon complex for waterfowl and shorebirds.

Conservation issues

Nguyen Chu Hoi *et al.* eds. (1997) report that fisheries yields have declined from 3,600 to 2,000 tonnes per year over the last 10 years. This report, together with those of La Van Hoang (1998) and ADB (1999), highlights a number of threats to the lagoon complex. These include natural processes of topographical change caused by sedimentation and erosion. For example, Nguyen Chu Hoi *et al.* eds. (1997) cite the example of the Tu Hien inlets of Tam Giang lagoon which were 'closed' to the sea by storms in December 1994. This led to a decline in salinity, the submergence of 1,000 ha of rice paddies and loss of production from 30 ha of shrimp ponds.

In addition to natural processes, the biodiversity of the lagoons is threatened by a range of human activities. The aquatic ecosystems are being polluted by pesticide run-off from agricultural and forest land, and by organic effluents from Hue city and other towns and villages in the surrounding area. At 2.6%, the annual rate of population growth in this part of central Vietnam is significantly higher than the national average (Nguyen Chu Hoi *et al.* eds. 1997). An additional source of pollution is oil: a number of studies have shown that the lagoons are polluted by oil from boats and ships (Nguyen Chu Hoi *et al.* eds. 1997).

Other threats from human activities include land reclamation for urban development, over-exploitation of aquatic resources, such as fish, shellfish, *Gracilaria* algae and seagrass beds, and destructive fishing practices. Finally, natural resources management practices in the upstream catchments of rivers are having adverse impacts on the lagoons they supply. For example, Nguyen Chu Hoi *et al.* eds. (1997) report that reservoir construction threatens to reduce nutrient inflows and alter hydrological regimes in the catchments of some rivers that drain into the lagoons. Deforestation threatens to make the rivers of this area more prone to sudden flooding, and may also increase turbidity and sedimentation.

Other documented values

It is known that the lagoons provide important spawning, feeding and nursery grounds for fish and shellfish. Primary productivity in the lagoons is also higher than in the adjacent coastal waters, because of the influx of organic matter from rivers entering the lagoons. This influx of nutrients supports high levels of primary production by phytoplankton, seagrass beds and algal communities. These factors combine to support a productive fishery and benthic invertebrate community. In turn, this productivity supports large numbers of migratory waterfowl and shorebirds, as well as an economically-important fisheries industry.

Fisheries represent the natural resource use of highest economic value at the Tam Giang-Cau Hai lagoon complex. Nguyen Chu Hoi *et al.* eds. (1997) estimated 1997 yields of fisheries products to be around 100 to 150 kg per hectare per year. Algae *Gracilaria* spp. is harvested on a large-scale basis for agar production. Seagrasses of various species, including *Najas indica* and *Paspalum* spp. are harvested for fertilisers. Algae of various species are harvested to provide fertiliser and organic matter for crops, such as tobacco, that are grown on the dry, sandy soils nearby.

The lagoons are thought to provide coastal protection for, buffer saltwater intrusion into, and regulate the micro-climate of densely inhabited and intensively cultivated areas inland. The lagoons also facilitate boat transport between towns and villages on their shores, and provide a sheltered, deep-water port for ocean-going vessels.

Related projects

ADB are currently supporting a regional technical assistance called *Coastal and Marine Environment Management in the South China Sea (East Sea)*, partly supported by a grant from the Swedish Development Cooperation Agency. This project aims to promote improved management of coastal and marine resources in the region, and is being implemented by MOSTE. Under this project, a draft coastal and marine protected area systems plan for Vietnam has been compiled, which reviews a number of candidate sites for inclusion within a revised national system of 30 marine and coastal protected areas. Tam Giang-Cau Hai is included in this plan (ADB 1999).

Literature sources

ADB (1999) Draft coastal and marine protected areas plan. Hanoi: Asian Development Bank.

Anon. (1997) Tam Giang-Cau Hai lagoon, Thua Thien Hue province, Vietnam: from coordination to sustainable use through institutional innovation. Draft project document prepared by Thua Thien Hue Provincial Department of Science, Technology and the Environment.

Cheung, C.P.S. (1992) Report on a visit to the coasts of Vietnam. Unpublished report to WWF Asian Region.

La Van Hoang (1998) The role of Tam Giang-Cau Hai lagoons in the economy, culture and society of Thua Thien Hue province. Paper presented at the Workshop on Management and Protection of Coastal Wetlands in Vietnam, Hue, July 1998.

Nguyen Chu Hoi, Nguyen Huy Yet and Dang Ngoc Thanh eds. (1998) [Scientific basis for marine protected areas planning]. Hai Phong: Hai Phong Institute of Oceanography. In Vietnamese.

Nguyen Chu Hoi, Tran Duc Thanh, Nguyen Huu Cu and Nguyen Nhat Thi (undated) Coastal lagoon management in central Vietnam. Paper presented at a workshop.

Scott, D. A. (1989) A directory of Asian wetlands. Gland: IUCN.

Ton That Phap (undated) A review of collected information on Hue lagoon system. Unpublished report.

Tran Duc Thanh, Nguyen Chu Hoi, Do Nam, Nguyen Mien, Nguyen Nhat Thi, Tran Dinh Lam, Nguyen Huu Cu and Nguyen Van Tien (1998) Impacts of the wetland preservation for Tam Giang-Cau Hai lagoon system. Paper presented at the Workshop on Management and Protection of Coastal Wetlands in Vietnam, Hue, July 1998.

Tran Duc Thanh, Tran Dinh Lan, Nguyen Chu Hoi, Nguyen Van Tien, Nguyen Nhat Thi, Nguyen Huu Cu, Truong Van La, Pham Dinh Trong, Pham Van Luong, Le Thi Thanh and Nguyen Thi Kim Anh (1997) Estimation of wetland potentials and the proposal to establish a wetland protected area of the Tam Giang-Cau Hai coastal lagoon. Hai Phong: Hai Phong Institute of Oceanography.

Tran Duc Thanh, Tran Dinh Lan, Nguyen Chu Hoi, Nguyen Van Tien, Nguyen Nhat Thi, Nguyen Huu Cu, Truong Van La, Pham Dinh Trong, Pham Van Luong, Le Thi Thanh and Nguyen Thi Kim Anh (1997) [Estimation of wetland potentials and the proposal to establish a wetland protected area of the Tam Giang-Cau Hai coastal lagoon]. Hai Phong: Hai Phong Institute of Oceanography. In Vietnamese.

Truong Van Tuyen (1997) Management of biological resources in Tam Giang lagoon: issues, participatory research application and challenges. Ottawa: International Development Research Centre.