

Thailand's Concerns in Endangered Species and Stock Enhancement

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Introduction

Thailand is situated in the tropical zone, and has abundant freshwater coastal and marine resources. Thai fishermen catch fish for family consumption and for trade. The problem of endangered aquatic species in Thailand is caused mainly by the lack of tools for proper fisheries resource management and the limited breeding and aquaculture technologies for some of the threatened species.

Endangered Species

Thailand is a member of the Convention on the International Trade of Endangered Species of Fauna and Flora (CITES) and it has regulations to control the trade of endangered species. The endangered species of major concern in Thailand are listed in Tables 1 and 2.

Status of seed production technology

The Thai Department of Fisheries is breeding some of these endangered species under the "Rehabilitation of Thai Local Fishes and Aquatic Animals Project". Some of these species are bred for restocking in the wild. Table 3 shows the list of some of the endangered species propagated by the Department of Fisheries.

Aquatic Resource Management

Fishery laws and regulations

There are several laws that have been adopted to regulate the import, export and

sale of endangered species. Likewise, there are also laws that protect species from various forms of inhumane treatment including illegal capture and killing.

Fishery Act, B.E. 2490 (1947)

1. Fishing is not allowed in the conservation area.
2. Disposal of toxic substances or pollutants into public water systems is not allowed.
3. Electric current or dynamite cannot be used for fishing.
4. Some fishing gears are prohibited during breeding season.

Importation Law, Decree B.E. 2547 (2004)

This law prevents the entry of diseases into Thailand which are brought in by exotic or imported fish species. Some fish species are not allowed for importation.

*Prohibition of Imported Dangerous Species
Decree B.E. 2530 (1987)*

This decree prevents the importation and aquaculture of dangerous (invasive) species.

*Wildlife Preservation and Protection Act,
B.E. 2535 (1992)*

This Act provides for the additional protection of wild animals including aquatic fauna. It is illegal to hunt, sell, buy or keep these wild animals or any of their parts or products (Sangchuen 2004, Fish Inspection Trade Section 2004).

Table 1. List of endangered freshwater species.

English name	Scientific name	Remark
Vertebrates		
Bonytongue	<i>Scleropages formosus</i>	CITES
Freshwater batfish	<i>Oreoglanis siamensis</i>	CITES
Siamese tiger fish	<i>Datnioides microlepis</i>	CITES
Ladderback loach/ Dwarf loach	<i>Botia sidhimunki</i>	IUCN
Indo china featherback	<i>Chitala blanci</i>	IUCN
Giant pangasius	<i>Pangasius sanitwongsei</i>	IUCN
Isok barb	<i>Probarbus jullieni</i>	IUCN
Laotian shad	<i>Tenualosa thibaudeaui</i>	IUCN
Giant barb	<i>Catlocarpio siamensis</i>	NC
Redtailed black shark	<i>Epalzeorhynchus bicolor</i>	NC
Catfish	<i>Clarias nieuhoffi</i>	NC
Indonesian featherback	<i>Chitala lopis</i>	NC
Carp	<i>Albulichthys albuloides</i>	NC
Carp	<i>Macrochirichthys macrochirus</i>	NC
Thicklip barb	<i>Probarbus labeamajor</i>	NC
Thinlip barb	<i>Probarbus labeaminor</i>	NC
Rasbora	<i>Rasbora somphongsi</i>	NC
	<i>Ceratoglanis scleronema</i>	NC
Catfish	<i>Kryptopterus limpok</i>	NC
	<i>Ompok eugeneiatus</i>	NC
	<i>Wallago leeri</i>	NC
	<i>Coilus undecimradiatus</i>	NC
Freshwater ray	<i>Himantura laoensis</i>	NC
Bleeker's whipray	<i>Himantura bleekeri</i>	NC
Freshwater whipray	<i>Himantura chaophraya</i>	NC
Sharpnose stingray	<i>Himantura gerrardi</i>	NC
Freshwater ray ?	<i>Himantura krempfi</i>	NC
White-rimmed stingray	<i>Himantura signifer</i>	NC
Honeycomb stingray	<i>Himantura uarnak</i>	NC
Daggertooth pike conger	<i>Muraenesox cinereus</i>	NC
Whitefin wolf-herring	<i>Chirocentrus nudus</i>	NC
Bornean grenadier anchovy	<i>Coilia borneensis</i>	NC
Goldspotted grenadier anchovy	<i>Coilia dussumieri</i>	NC
Sabretoothed thryssa	<i>Lycothrissa crocodilus</i>	NC
Lindman' grenadier anchovy	<i>Coilia lindmani</i>	NC
Lowjaw grenadier anchovy	<i>Coilia macrognathus</i>	NC
Dusky-hairfin anchovy	<i>Setipinna melanochir</i>	NC
	<i>Setipinna waitei</i>	NC
	<i>Pellona filigera</i>	NC
Raconda	<i>Raconda russeliana</i>	NC
	<i>Barilius ornatus</i>	NC
Dwarf rasbora	<i>Boraras maculatus</i>	NC
	<i>Boraras micros</i>	NC
	<i>Boraras urophthalmoides</i>	NC
Leaping barb	<i>Chela caeruleostigmata</i>	NC
Indian glass barb	<i>Chela laubuca</i>	NC
	<i>Cirrhinus microlepis</i>	NC

Table 1 (continued from p. 132)

English name	Scientific name	Remark
Hora danio	<i>Danio shanensis</i>	NC
	<i>Discherodontus ashmeadi</i>	NC
	<i>Discherodontus schroeden</i>	NC
Hoven's carp	<i>Leptobarbus hoeveni</i>	NC
	<i>Mekongina erythrospila</i>	NC
	<i>Oxygaster maculicauda</i>	NC
	<i>Poropuntius speleops</i>	NC
	<i>Puntioplites bulu</i>	NC
	<i>Rasbora agilis</i>	NC
	<i>Rasbora bankanensis</i>	NC
	<i>Rasbora heteromorpha</i>	NC
Harlequin rasbora	<i>Rasbora pauciperforata</i>	NC
Glowlight rasbora	<i>Botia eos</i>	NC
Sun loach	<i>Botia longidorsalis</i>	NC
	<i>Botia splendida</i>	NC
Glass catfish	<i>Ellopostoma megalomycter</i>	NC
	<i>Homaloptera thamicola</i>	NC
	<i>Nemacheilus trogocataractus</i>	NC
	<i>Schistura jarutanini</i>	NC
	<i>Schistura oedipus</i>	NC
	<i>Vaillantella maassi</i>	NC
	<i>Bagrichthys macracanthus</i>	NC
	<i>Heterobagrus bocourti</i>	NC
	<i>Leiocassis poecilopterus</i>	NC
	<i>Leiocassis stenomus</i>	NC
	<i>Olyra longicaudata</i>	NC
	<i>Kryopterus apogon</i>	NC
	<i>Kryopterus bicirrhis</i>	NC
	<i>Kryopterus hexapterus</i>	NC
	<i>Ompok hypophthalmus</i>	NC
	<i>Silurichthys hasseltii</i>	NC
	<i>Silurichthys schneideri</i>	NC
	<i>Silurichthys leucopodus</i>	NC
	<i>Silurichthys phaiosoma</i>	NC
	<i>Silurichthys cochinchinensis</i>	NC
Angler catfish	<i>Akysis armatus</i>	NC
	<i>Akysis leucorhynchus</i>	NC
	<i>Akysis macronema</i>	NC
	<i>Akysis maculipinnis</i>	NC
	<i>Akysis pictus</i>	NC
	<i>Parakysis verrucosus</i>	NC
	<i>Chaca bankanensis</i>	NC
Walking catfish	<i>Clarias batrachus</i>	NC
	<i>Clarias leiacanthus</i>	NC
	<i>Prophagorus cataractus</i>	NC
	<i>Prophagorus nieuhoi</i>	NC
Stinging catfish	<i>Heteropneustes fossilis</i>	NC
	<i>Arias leiotetocephalus</i>	NC

Table 1 (continued from p. 133)

English name	Scientific name	Remark
Beardless sea catfish	<i>Batrachocephalus mino</i>	NC
	<i>Hemiaris stormi</i>	NC
	<i>Hemipimelodus borneensis</i>	NC
	<i>Hemipimelodus siamensis</i>	NC
	<i>Ketengus typus</i>	NC
Giant catfish	<i>Arius thalassinus</i>	NC
	<i>Neostethus bicornis</i>	NC
	<i>Neostethus lankesteri</i>	NC
	<i>Neostethus siamensis</i>	NC
	<i>Phenacostethus posthon</i>	NC
Smith's priapium fish	<i>Phenacostethus smithi</i>	NC
	<i>Hemirhamphodon</i> <i>pogonognathus</i>	NC
	<i>Zenarchopterus dunckeri</i>	NC
	<i>Zenarchopterus pappenheimi</i>	NC
	<i>Doryichthys martensii</i>	NC
Spotted seahorse	<i>Hippocampus kuda</i>	NC
Pipe fish	<i>Indostomus paradoxus</i>	NC
Fire eel	<i>Mastacembelus erythrotaenia</i>	NC
Orange-spotted grouper	<i>Epinephelus coioides</i>	NC
Giant grouper	<i>Epinephelus lanceolatus</i>	NC
Atlantic tripletail	<i>Lobotes surinamensis</i>	NC
	<i>Plectorhinchus haetodontoides</i>	NC
Flagfin prawn goby	<i>Mahidolia mystacina</i>	NC
	<i>Mahidolia normani</i>	NC
	<i>Odontobutis aurarmus</i>	NC
	<i>Mugilogobius rambaiae</i>	NC
Silver pomfret	<i>Pampus argenteus</i>	NC
Chinese silver pomfret	<i>Pampus chinensis</i>	NC
Pikehead	<i>Luciocephalus pulcher</i>	NC
Malay combtail	<i>Belontia hasselti</i>	NC
	<i>Parosphromenus paludicola</i>	NC
Pearl gourami	<i>Trichogaster leerii</i>	NC
	<i>Psettodes erumei</i>	NC
	<i>Chonerhinus naritus</i>	NC
	<i>Tetraodon suvatti</i>	NC
Invertebrates		
Panda crab	<i>Phricotelphusa sirindhorn</i>	CITES
Pigal crab	<i>Demanietta sirikit</i>	CITES
Mealy crab	<i>Thaipotamon chulabhorn</i>	CITES

CITES – The Convention of International Trade in Endangered Species Fauna and Flora

IUCN – International Union for the Conservation of Nature

NC – National Concern

Table 2. List of endangered brackishwater and marine species.

English name	Scientific name	Remark
Vertebrates		
Whale shark	<i>Rhincodon typus</i>	NC
Pointed sawfish	<i>Anoxypristis cuspidata</i>	NC
Largetooth sawfish	<i>Pristis microdon</i>	NC
Smalltooth sawfish	<i>Pristis pectinata</i>	NC
Longcomb sawfish	<i>Pristis zijsron</i>	NC
Humpback grouper	<i>Cromileptes altivelis</i>	NC
Slender bamboo shark	<i>Chiloscyllium indicum</i>	NC
Grey bamboo shark	<i>Chiloscyllium griseum</i>	NC
Shark	<i>Chiloscyllium plagiosum</i>	NC
Zebra shark	<i>Stegostoma fasciatum</i>	NC
Sicklefin weasel shark	<i>Hemigaleus microstoma</i>	NC
Silvertip shark	<i>Carcharhinus albimarginatus</i>	NC
Grey reef shark	<i>Carcharhinus amblyrhynchos</i>	NC
Pigeon shark	<i>Carcharhinus amboinensis</i>	NC
Copper shark	<i>Carcharhinus brachyurus</i>	NC
Bull shark	<i>Carcharhinus leucas</i>	NC
Blacktip shark	<i>Carcharhinus limbatus</i>	NC
Blacktip reef shark	<i>Carcharhinus melanopterus</i>	NC
Dusky shark	<i>Carcharhinus obscurus</i>	NC
Sandbar shark	<i>Carcharhinus plumbeus</i>	NC
Spot-tail shark	<i>Carcharhinus sorrah</i>	NC
Shark	<i>Galeocerdo cuvier</i>	NC
Milk shark	<i>Rhizoprionodon acutus</i>	NC
Grey sharpnose shark	<i>Rhizoprionodon oligolinx</i>	NC
Spadenose shark	<i>Scoliodon laticaudus</i>	NC
Whitetip reef shark	<i>Triaenodon obesus</i>	NC
Bowmouth guitarfish	<i>Rhina ancylostoma</i>	NC
Guitar fish	<i>Rhynchobatus australiae</i>	NC
Guitar fish	<i>Rhinobatos granulatus</i>	NC
Guitar fish	<i>Rhinobatos schlegelii</i>	NC
Guitar fish	<i>Rhinobatos thouini</i>	NC
Guitar fish	<i>Rhinobatos typusni</i>	NC
Brown numbfish	<i>Narcine brunnea</i>	NC
Electric ray	<i>Narcine indica</i>	NC
Electric ray	<i>Narcine maculata</i>	NC
Electric ray	<i>Narcine prodorsalis</i>	NC
Numbray	<i>Narke dipterygia</i>	NC
Electric ray	<i>Temera hardwickii</i>	NC
Short-tail stingray	<i>Dasyatis brevicaudata</i>	NC
Cowtail stingray	<i>Pastinachus sephen</i>	NC
Spotted eagle ray	<i>Aetobatus narinari</i>	NC
Mottled eagle ray	<i>Aetomylaeus maculatus</i>	NC
Ray	<i>Aetomylaeus milvus</i>	NC
Banded eagle ray	<i>Aetomylaeus niehofii</i>	NC

Table 2 (continued from p. 135)

Ornate eagle ray	<i>Aetomylaeus vespertilio</i>	NC
Rough cownose ray	<i>Rhinoptera adspersa</i>	NC
Flapnose ray	<i>Rhinoptera javanica</i>	NC
	<i>Harengula atricaudata</i>	NC
	<i>Dorosoma chacunda</i>	NC
	<i>Dorosoma nasus</i>	NC
Invertebrates		
	Order Antipatharia	CITES
	Order Gorgonacea	CITES
	Order Scleractinia	CITES
	Order Stylasterina	CITES
	Order Heliopracea	CITES
	Order Alcyonacea	CITES
	Order Actinaria	CITES
Scaly giant clam	<i>Tridacna</i> sp.	CITES
Trumpet shell	<i>Charonia tritonis</i>	CITES

CITES – The Convention of International Trade in Endangered Species of Fauna and Flora
NC – National Concern

Goods Export and Import Act B.E. 2522 (1979)

This Act protects wild animals especially six species of turtles. Exportation of goods made from parts of the turtle or any wild animal must have permits. The export of ornamental marine fish is also prohibited.

Habitat protection and rehabilitation

Habitat protection and rehabilitation are undertaken as follows:

1. The areas of the river near or connected to the temples are considered as "No fishing Zone". Fishing with any type of gear is not allowed in this area.
2. A "Conservation Zone" as declared by the Minister of the Ministry of Agriculture and Cooperatives or Provincial Governor is an area designated for broodstock. Fishing for household consumption can be allowed with the use of some fishing gears such as fishhooks, etc.
3. Thousands of 1.5 m³ cement structures have been deployed as artificial reefs in

several places especially in the Andaman Sea. The smallest area covered by artificial reefs is 0.25 sq km and the largest is 30 sq km. Likewise, the artificial fish habitats have been deployed in rivers. Wood stalks and used rubber tires are utilized as fish shelters in the conservation zone.

Stock Enhancement Program

Species stocked

Fingerlings are collected from the wild and reared to broodstock size at fishery stations. Induced spawning is sometimes done by mobile teams from the Department of Fisheries. The fertilized eggs are moved from the site to hatcheries of the fishery stations. Most of the fingerlings are restocked yearly in natural habitats and the remaining stocks are kept and grown as potential broodstock (Table 4).

Release strategies

Most of the fingerlings of endangered species produced by the Department of Fisheries were stocked in sites where the

Table 3. Some of the endangered species produced by Department of Fisheries, Thailand.

Common name	Scientific name	Production per year (pcs)
Asian bonytongue	<i>Scleropages formosus</i>	100-200
Giant softshell turtle	<i>Chitra chitra</i>	100-200
Ladderback loach	<i>Botia sidthimunki</i>	10,000
Indochina featherback	<i>Chitala blanci</i>	100-300
Giant catfish	<i>Pangasianodon gigas</i>	100,000
Giant Pangasius	<i>Pangasius sanitwongsei</i>	10,000-20,000
Isok barb	<i>Probarbus jullieni</i>	200,000-300,000
Giant barb	<i>Catlocarpio siamensis</i>	300,000

founder or parental stocks were originally obtained. However, marking or tagging of the released animals was not done. Likewise, impact on catches and cost-benefit analysis were not done.

Government agencies and non-government organizations (NGOs) involved; co-management by local communities and stakeholders

Cooperation in conservation, protection and rehabilitation of aquatic animals in Thailand is quite successful. Several agencies, including NGOs, participate in these activities. One of the Queen's projects, the "Rehabilitation of Marine Fisheries Resources Project" was done in 2002. The project was supported by government agencies and several organizations. About 208 units of cabins from old unused trains and 707 units of damaged cement pipes were

donated by the State Railway of Thailand and the Department of Highways for artificial reefs. The Department of Fisheries studied the sites and the impact of the establishment of these artificial reefs to fisheries. The Thai Navy studied their impact on the environment. Cooperation and sharing of resources were discussed by small-scale and large-scale fishermen for the sustainability of the fishery resources.

References

Sangchuen Y. 2004. Study on practical implementation according to wild animal reservation and protection Act, B.E. 2535. Department of Fisheries. Thailand
 Fish Trade Inspection Section. 2004. Wildlife Preservation and Protection Act, B.E. 2535 (1992). Department of Fisheries. Thailand

Table 4. List of endangered species stocked in the wild by the Thai Department of Fisheries.

Species stocked	No. of pcs	Area covered	First stocking year
<i>Probarbus jullieni</i>	240,000	Whole country	1981
<i>Pangasianodon gigas</i>	50,000-100,000	Whole country	1985
<i>Catlocarpio siamensis</i>	300,000	Whole country	1986
<i>Rana blythii</i>	30,000-50,000	480 ha	1990
<i>Pangasius sanitwongsei</i>	10,000-20,000	Whole country	1999
<i>Botia sidthimunki</i>	5,000	Nan River 5	2003