THE TECHNICAL ADVISORY BODY FOR FISHERIES MANAGEMENT (TAB)

Status of the Mekong *Pangasianodon hypophthalmus* resources, with special reference to the stock shared between Cambodia and Viet Nam

Mekong Fisheries Management Recommendation Nº 1

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Working towards Effective, Sustainable and Regional Fisheries Management in the Lower Mekong Basin

BACKGROUND

Reports that the average size of the Mekong catfish (*Pangasianodon hypophthalmus*) in the catches of some *dai* fisheries is declining has raised concerns that this valuable resource is at risk from overexploitation.[1]

At a conservative estimate, the annual catch in Cambodia alone exceeds 2,000 tonnes. However, the catch assessments supporting these numbers do not include all of Cambodia's fisheries or the number of *P. hypophthalmus* caught in Viet Nam. The true size of the catch could easily be three times higher.

A review of existing data[2] that suggests the wild stock has declined over the last decade. The full extent of damage caused by the *P. hypophthalmus* fishery as a whole, and by individual fisheries in particular, is not known. This is because catch records are unreliable and the knowledge of the fish's reproductive biology is incomplete.

However it is clear, that despite prohibiting legislation, the fish is under intense fishing pressure at all stages of its life cycle, from fry to mature adult. Moreover, while artificial propagation is successful in Viet Nam, the demand for fry spawned in Cambodia for use in Vietnamese aquaculture continues to put strain on the wild population.

This note presents a summary of the available information on *P. hypophthalmus* and recommends measures that will unsure the survival of this resource.

FACTORS CONTROLING THE VIGOUR OF THE WILD STOCK

Distribution and life cycle

1. The wild stock of *P. hypophthalmus* contains two geographically discrete populations separated by a natural barrier created by the Khone falls. These genetically distinct populations are independent having different spawning grounds and migration systems.
2. The 'southern population' spawns in the stretch of the Mekong between the Khone falls and the town of Kratie. Therefore all *P. hypophthalmus* captured in Viet Nam originate from Cambodia.
3. *P. hypophthalmus* takes more three years to reach sexual maturity. Because the number of medium and small-scale fisheries is increasing a smaller percentage of fish survive to reach maturity .

Status of the wild stock

1. In the deep pools that form the fishes major spawning grounds, illegal fishing using explosives (often carried out by members of the police force or the army) is impairing the reproductive success of the species.
2. Data from *dai* fry fisheries shows a dramatic decline in the number of fry caught, from 108-165 billion in 1981 to 0.5-2.1 billion in 1998. This fall occurred despite an increase in the number of *dai* units in operation.[3]
3. The introduction of fry spawned and raised in captivity may have halted or reversed similar decline in the fry catch in Viet Nam.[4]

4. The catch of sub-adult and adult fish in the Great Lake and Tonle Sap River is holding up well despite the increased catch of fry.
5. This may be because the feeding grounds around the Great Lake are still largely intact. No data is available from the more ecologically degraded floodplain south of Phnom Penh.

Fishery Exploitation

1. Although prohibited by law, small bag net, or *dai*, fry fisheries still operate in Cambodia and Viet Nam. Most of the fry caught in Cambodia is exported to Viet Nam for aquaculture seed.
2. The role of fry fisheries in the decline of *P. hypophthalmus* is not clear because the natural mortality of this species is very high. A more likely cause is the expansion of other medium-scale fisheries, such as the *dai* fishery on the Tonle Sap River. These target migrating fish thereby increasing fishing pressure and leaving few adult fish alive to spawn. Data from daily fish market landings in and around Phnom Penh supports this conclusion. In the instance of one market (Kampong Cham) over 80% of the landing comprised fingerling-sized fish.
3. Other *P. hypophthalmus* fisheries use a variety of fishing gear; the most common are gillnets, hooks and lines, seines and trawls. Fishing lots and big arrow-shaped traps in the Great Lake also take some fish. Some assessments of the quantities of these catches are available, but regular monitoring has not been possible.

Aquaculture

1. Although hatchery production in Viet Nam reportedly exceeds demand, wild fry collection in Cambodia is still very significant. This suggests that Vietnamese hatcheries are not yet producing enough good quality seed.
2. Wild seed fetches higher prices because many fish farmers believe it is more vigorous; this encourages the Cambodian fry fisheries to maintain the level of their fry catch.

DISCUSSION

There is little doubt that the wild stock of *P. hypophthalmus* is under pressure from overexploitation. The number of fry caught has declined over the last decade and there is some evidence that the size of individual fish caught is getting smaller. However, a detailed analysis of the relationship between the fisheries catch and the status of the *P. hypophthalmus* stock requires complete records of the catches from individual fisheries and more detailed knowledge of the reproductive biology of the species. Notwithstanding this, a number of measures to reduce the pressure on the wide sock can be introduced immediately, these are listed on the following pages.

The preservation of the *P. hypophthalmus* resource is unquestionably a trans-boundary concern because all the fish caught in Viet Nam are a product of spawning in Cambodia. Therefore, any measures taken to support the wild stock require the cooperation and participation of Cambodian and Vietnamese fisheries and fishery agencies.

RECOMMENDED MANAGEMENT ACTIONS

Further Research

- ✓ Define the location of the spawning grounds of both the northern and the southern populations and describe their physical and ecological characteristics.
- ✓ Resolve larval drift and migration patterns.
- ✓ Determine biological parameters including age at first maturity, length/weight and age relationships.
- ✓ Find out the mortality caused by different fishing gear and the effects of fry fishery.
- ✓ Record the quantities of catfish caught in Rows 3 and 4 of the *dai* Fishery in the Tonle Sap near Phnom Penh. (In the meantime Row 1 should be closed and two of the four units of Row 2 left open for monitoring.)
- ✓ Find out how many catfish fry are caught by the *santouch kontrey pra* fishery that targets Pangasiid fingerlings.
- ✓ Record the catches of the barrages in Kampong Chhnang in detail. (Some of these should be closed if they are found to catch important quantities of brood stock.)
- ✓ Find out which small and medium-scale fisheries capture most catfish and at what sizes.

Protecting natural habitat

- ✓ To help ease the pressure on wild stocks, devise and implement measures to protect natural floodplain habitats.

Illegal fisheries and fishing practices

- ✓ Ensure local authorities enforce, and fishers comply with, the existing legislation. Continue to educate both parties about the damage illegal fisheries cause to wild stocks.
- ✓ Organise and oversee bilateral discussions between stakeholders in Cambodia and Viet Nam to find ways to protect and manage stocks of catfish.
- ✓ Increase the awareness amongst police and military personnel of the damage to wild stocks caused by using explosives to catch fish.
- ✓ Strengthen NGO involvement with fishing communities in the stretch of the Mekong in Kratie and Stung Trenh provinces to promote responsible fishing practices.

Seed production

- ✓ Increase the quality of fry/fingerings bred in hatcheries by raising them for a longer period.
- ✓ Increase hatchery production of *P. hypophthalmus* of fry in Cambodia, and *P. bocourti* in Viet Nam.

END NOTES

1. At its first meeting, in 2000, the Technical Advisory Body for Fisheries Management (TAB) commissioned a review of the status of *P. hypophthalmus* resources. The review was undertaken by staff of the MRC Fisheries Programme and their findings published in 2002 (see end note below).

2. Van Zalinge, N., Lieng Sopha, Ngor Peng Bun, Heng Kong, and Jørgensen, J.,V. (2002). Status of the Mekong *Pangasianodon hypophthalmus* resources, with special reference to the stock shared between Cambodia and Viet Nam. *MRC Technical Paper* No. 1, Mekong River Commission, Phnom Penh. 29 pp.

3. Estimated numbers of *P. hypophthalmus* fry caught in the *dai* fishery in Cambodia.

Year	Number of fry caught (billion)	Number of *dai* units
1981	108 -165	650
1991	5.0 -12.0	1050
1997	2.0 - 4.0	1050
1998	0.9 - 2.1	948

Data sources: 1981, 91 and 97, Touch (2000); 1998, Ngor (1999)

4. Estimated numbers of *P. hypophthalmus* fry caught in the *dai* fishery in Viet Nam, An Giang province.

Year	Number of fry caught	Hatchery fry production
1977	200-800	-
1994	62	-
1995	60	-
1996	56	-
1997	48	6.8
1998	36	25.6
1999	27	90.0
2000	0.4	99.7

Data sources: 1997, Khanh (1996); 1998-2000, Tung *et al.* (2001)

5. Catch of *pra* (mainly *P. hypopthalamus*) in bag net (*dai*) fishery in the Tonle Sap River during the October-March Seasons of 1962-63 and 1995 to 2002

Year	Catch in tonnes	Percentage of total *dai* catch
1962-63	9	0.40
1995-96	95	0.70
1996-97	28	0.18
1997-98	157	1.72
1998-99	66	0.74
1999-00	162	1.40
2000-01	201	1.34
2001-02	223	1.63

Data sources: 1962-65, Fily and d'Aubenton (1965); 1995 to 2002, Cambodia Capture Fisheries Project (2003)

6. Catch of *pra* (mainly *P. hypophthalmus*) in a variety of Cambodian fisheries

Year	*pra* catch in tonnes	% of total gear catch	Type of fishery
1994-97	1367	5.5	Mainly Great Lake fishing lots
1997-98	1276	5.0	Mainly Great Lake fishing lots
1994-97	330	1.3	Gillnets, seines, etc. Great Lakes
1997-98	366	1.6	Gillnets, seines, etc. Great Lakes
1997-98	109	6.6	Great lake arrow-shaped traps

Data sources: 1994-97, Deap *et al.* (1998); 1997-98, Thor *et al.* (1999); 1997-98, Troeung and Phem (1999)

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