

**THUA THIEN HUE PROVINCE PEOPLE'S COMMITTEE
HUONG TRA DISTRICT PEOPLE'S COMMITTEE**

**REPORT ON
PLANNING OF FIXED FISHING GEARS IN THE LAGOON OF
HUONG TRA DISTRICT**



HUONG TRA, June 2011

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Chapter 1. OBJECTIVE, METHODOLOGY AND PLANNING

1.1 Planning objectives

1.1.1 General objectives

To reduce the pressure on the lagoon fisheries towards the sustainable exploitation of lagoon resources and stabilize the life of fishermen.

1.1.2 Specific objectives

- a) Generate the clearance for the waterways
- b) Increase fluid dynamics and movement of aquatic species in Tam Giang Lagoon
- c) Defining of conservation and biodiversity sub-zones
- d) Build the plan for zoning and fixed fishing gear rearrangement on the water surface of Huong Tra District

1.2 Main method for the plan making

1.2.1 Study of related materials

- a) Fisheries law, legal documents at the central and legal documents stipulating the current fisheries
- b) Research materials on the environment, ecology, water bodies, and aquatic resources and researches on the nursing grounds in Thua Thien Hue Lagoon
- c) Researches on the socio-economic assessment and analysis, and fisheries management in Thua Thien Hue Lagoon
- d) Materials on fisheries management in general; inland fisheries management and international small-scaled coastal management

1.2.2 Utilization of remote sensing, GPS and GIS

- a) Build the digital map on the gear status in the lagoon by getting the exact position of each gear unit, using the satellite positioning equipment GARMIN extrex. Then digitalize them into map layers of fixed fishing gears (use the Arcgis 9.3). Map layers of other zones like the fisheries conservation sub-zone, coastal buffer sub-zone and commune boundary buffer are similarly conducted
- b) Use GIS so that these map layers will overlay others for the specific objectives of the planning tasks. For instance, overlay the gear layer over the administrative layer to have the exact status map of each commune or overlay the gear map over the waterway map to have the violating gears, etc
- c) Use the remote sensing technology to identify the cores of conservation sub-zones for the suitable rearrangement of gears

1.2.3 Functional sub-zone identification

The water surface of Huong Tra District is divided into specific functional sub-zones, allowing and excluding the operation of certain gears. Fisheries conservation sub-zones are also proposed to be under the planning project. The appropriate fixed fishing gear

rearrangement will be carried out based on the zoning plan. This will create the favorable conditions for a better and more effective exploitation and protection of lagoon resources.

1.2.4 Expert consultation

Use the consultation of experts from the Research Institute and universities for appraisal of the lagoon environment, and identification of sites and technical parameters when setting up nursing and breeding grounds

1.2.5 Participation of related parties

- a) All aspects of the planning from the survey of status to the building of the zoning plan, fixed fishing gear rearrangement involves the participation of Huong Tra DARD, Huong Phong and Hai Duong CPCs, Huong Giang, Thuong Tay and Vinh Tri FAs (Hai Duong) and Dong Hoa and Dong Phong FAs (Huong Phong)
- b) The waterway Division of Thua Thien Hue Province directly involves in the field survey to propose the adjustment of the traffic ways in the lagoon of Huong Tra District to be in line with the reality
- c) The Sub-DECAFIREP, Huong Tra DARD, CPCs and FAs directly participate in the survey and evaluation of sites to be proposed as the conservation sub-zones
- d) Organize meetings to discuss the planning contents at different levels including commune level, FA level and gear level, and so on. Fisheries Associations represent for fishing communities during the construction of the planning project, in details:
 - + Provide the aboriginal knowledge
 - + Promote the State policies and guidelines to the community
 - + Members show the solidarity and share the resource use; issues for discussion easily get the agreement
 - + The rearrangement of fixed fishing gears will bring about high effectiveness thanks to the participation and consent of the community
 - + Assist the authorities to monitor the implementation after the rearrangement
- e) Organize workshops with the participation of professional agencies, Huong Tra DPC, related parties at the district, Huong Phong and Hai Duong CPCs, and representatives of FAs so that the planning project goes in line with the right orientation of the Province, of the district and the consensus of related parties

Nowadays, in Huong Tra District, there are 5 FAs including Huong Giang, Thuong Tay, Vinh Tri (Hai Duong Commune), Dong Hoa and Dong Phong (Huong Phong Commune). FA boundary was discussed and consented by the CPCs and FAs. In Hai Duong Commune, the concrete poles have been installed on land to define the commune FA boundaries. The planning project also involves the zoning plan, and gear rearrangement for each FA towards the fishing rights allocation.

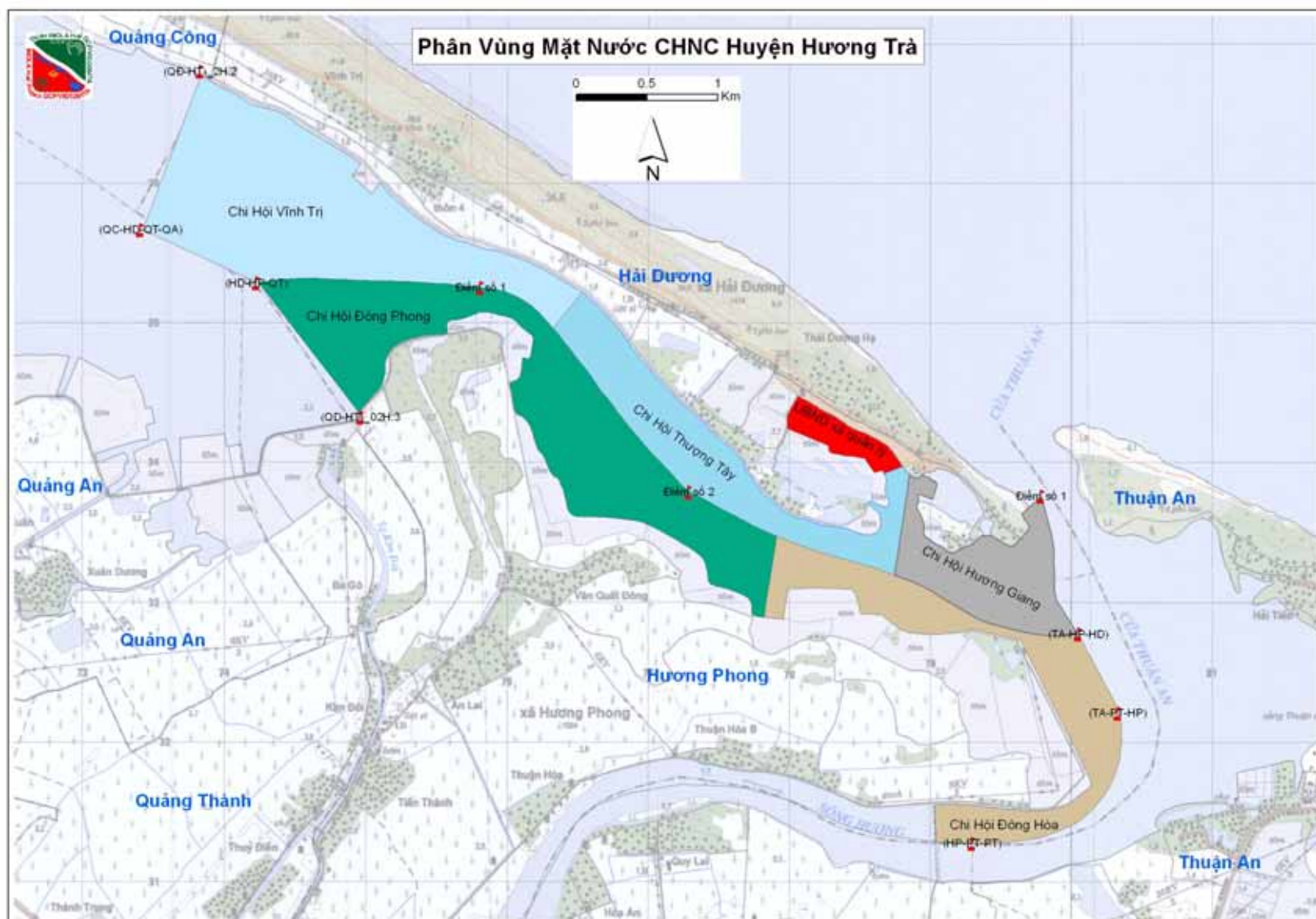


Figure 1. Zoning of lagoon water surface for FA management

Chapter 2. NATURAL CONDITIONS, LAGOON OF HUONG TRA DISTRICT

2.1 Geographical position

Huong Tra is among five lagoon districts of Thua Thien Hue Province. It does not have big water surface like other districts with 685 ha, belonging to Huong Phong and Hai Duong communes with the length of 8km. Huong Tra District is adjacent to Thuan An and Phu Vang District to the South and South East, and adjacent to Quang Dien District to the West and North West. Its water body has a narrow width in Tam Giang – Cau Hai Lagoon; the smallest width (Ca Cut Bridge) is only 450m and the biggest width (from Ca Cut Bridge to Thuan An Inlet) is 1,110m. Therefore, this is an important area, like a pharynx connecting Tam Giang Lagoon and Thuan An Inlet. The allocation of fishing gears and aquaculture in the water surface has a remarkable impact on the water circulation and movement of aquatic species from the sea to Tam Giang and vice versa.

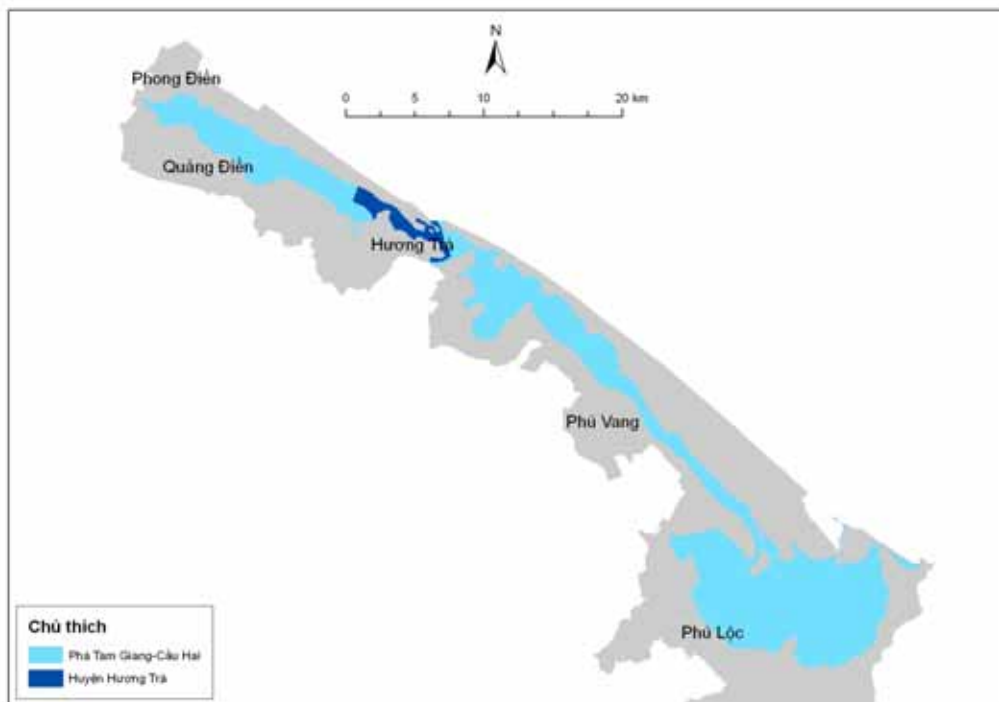


Figure 2. Water body of Huong Tra District in the view of Tam Giang – Cau Hai Lagoon

2.2 Natural feature impacting the fisheries production

2.2.1 Climate and weather

In Huong Tra District, like in other districts of Thua Thien Hue Province, there are two seasons in the year, including the dry season from March to August and the rainy season from September to February. The yearly average temperature is 24.4°C (relatively high). Months with high temperature are June, July and August. Months with low temperature include December, January and February. The annual rainfall is very big with the average numeric value of 2,636-2,867mm.

The annual average shining time is 1,839.6 hours. The months with the biggest shining is May, June, and July. The months with the least shining is February and December. The months receiving the highest amount of rain are from September to December. The annual rain amount is quite big with the average numeric value of 2,636 – 2,867mm.

Regarding wind regime, there are two seasons including summer and winter. West and South wind (Laotian wind) flows from April to August, which is also the hot period with the high temperature, impacting the lagoon. Laotian wind in combination with the dry season often leads to drought, shortage of water and high salinity, causing impacts on the cultivated trees and animals, especially shrimp culture.

Thunder normally occurs in April, May and September. Storms take place from July to November. Storms, big rain, water rise and floods normally happen in September, October and November, causing disasters for the life and production of lagoon dwellers.

2.2.2 Hydraulic and tidal regime

Thuan An inlet has the irregular semi-tidal regime with the smallest tidal range of 0.35-0.5m. The wave direction is in the East-North with the frequency of 99% and the height of 0.25-3m. In summer, the wave direction is East with the frequency of 93% and the height of 0.25-1m.

Thuan An inlet has the semi-tidal regime with the small tidal fluctuation range and little alteration in the year. The fluctuation of the water level at the wave peak and the foot is 50cm on average. The tidal range is the biggest in the dry season and smallest in the rainy season. The biggest tidal range is 60-80cm and the average range in the year is 45cm.

Big rivers providing water to Tam Giang Lagoon include Huong River, O Lau River and Bo River. These rivers meet at the lagoon with the water amount of $3 \times 10^9 \text{ m}^3/\text{year}$.

2.2.3 Feature of the water environment

According to the report of the Institute of Marine Environment and Resources (IMER), 2007, there are three ecological zones in the water body of Huong Tra District, including:

- a) Fresh and brackishwater zone: mainly from Huong River to the lagoon
- b) Brackishwater zone: mainly from the boundary with Quang Dien District and Ca Cut Bridge
- c) Brackish and saline water zone: near Thuan An Inlet, adjacent to Thai Duong Ha Nam and Thai Duong Thuong Tay villages in Hai Duong Commune

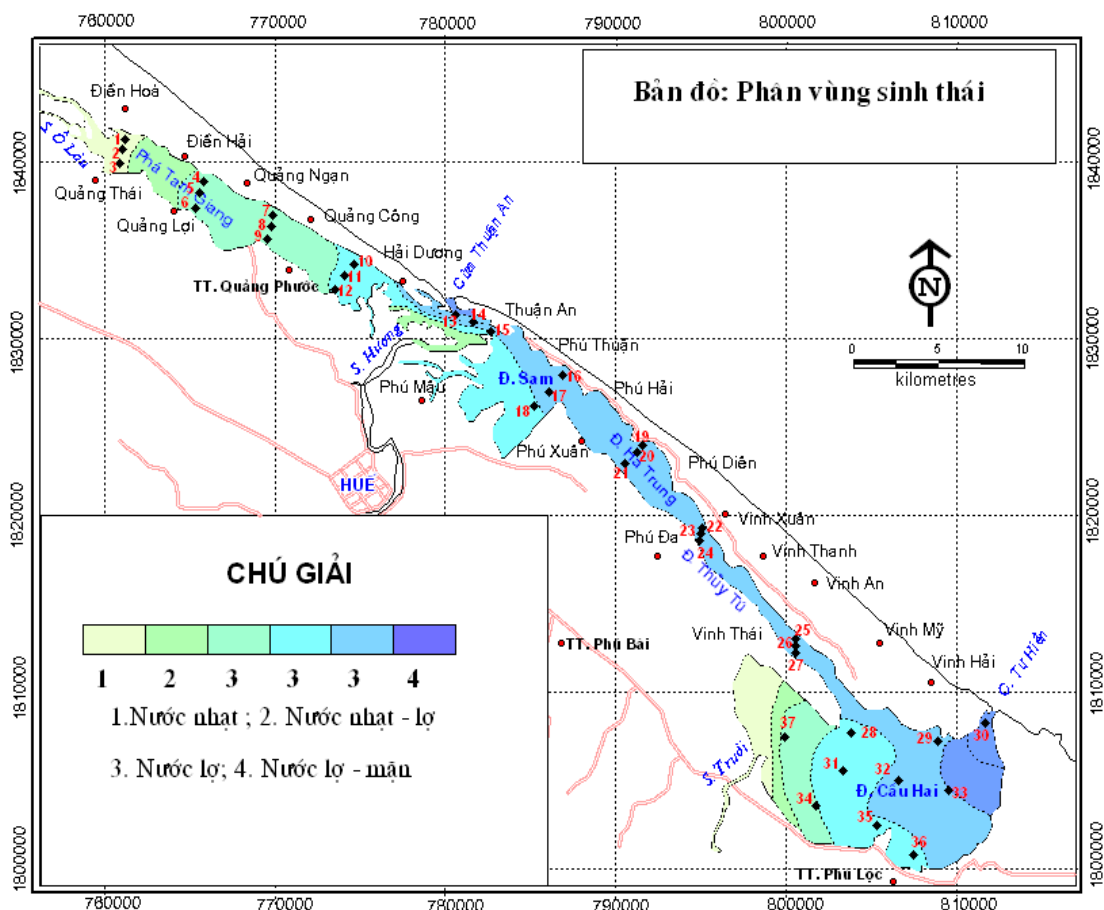


Figure 3. Map of ecological zoning

(Source: IMER 2007)

Table 1. Water environment features of ecological sub-zones in Tam Giang-Cau Hai Lagoon, 2006

	TRAN.	PH		SALINITY		DO		T ^o C	
		SURFACE (1)	BOTTOM (2)	1	2	1	2	1	2
FRESH WATER									
4-2006	0.73	7.12	7.10	1	1	7.1	6.94	28.3	27.6
5-2006	0.7	6.40	6.35	1	1	5.93	5.93	29.26	29.7
8-2006	0.9	5.69	5.85	1	1	6.26	5.86	30.93	30.46
11-2006	1.05	7.83	7.88	1.00	1.00	6.37	6.17	31.03	31.13
FRESH - BRACKISH WATER)									
4-2006	0.8	7.67	7.75	1	1	7.19	6.89	28.4	27.9
5-2006	1.06	8.32	8.34	11.6	11.3	6.86	7.14	30.9	29.6
8-2006		6.94	7.0	1	1	6.9	6.63	30.86	30.53
11-2006	1.00	7.93	7.82	1.33	1.67	6.40	6.10	31.07	30.80
BRACKISH WATER									
4-2006	1.5	8.19	8.22	12.7	13.8	6.85	6.55	28.9	27.9
5-2006	1.10	8.25	8.24	19.7	20.1	6.47	6.19	31.7	31.3
8-2006	1.14	7.64	7.04	12.27	14.86	6.41	5.81	30.82	29.96
11-2006	1.66	7.92	7.94	9.21	13.52	6.37	6.07	29.43	30.68
BRACKISH - SALT WATER									
4-2006	1.51	7.97	8.13	14	18	6.65	6.58	27.9	27
5-2006	1.52	8.18	8.18	23.5	28.33	6.71	6.18	30.2	29.2
8-2006	0.99	7.21	7.34	5.17	9.67	6.50	6.07	30.88	29.78
11-2006	1.22	7.88	7.95	11.83	20.75	6.32	5.98	29.17	29.15

(Source: IMER 2007)

Bottom topography: Tam Giang Lagoon creates an underground tidal rivulet with the average depth of 2m and deeper towards Thuan An Inlet and at 4-5m (IMER 2007)

2.2.4 Biological features

The lagoon water body of Huong Tra District is the intersection of different living environments, attributive to the biodiversity. The integrated planning of fisheries exploitation in Thua Thien Hue Lagoon considers this to be a sensitive site.

This area is adjacent to the sea inlet. Besides, Huong River flows into the lagoon so establishes the coastal and river mouth ecological sub-system with the richness of nutrients but the low salinity is suitable for the development of swamps and sub-merged seagrass.

There are seagrass carpets like in Con Sao and Con Te with the area of 8ha and the outstanding species of *Zostera japonica* (IMER 2010). A similar seagrass is also found in Con Say. The special role of seagrass carpet is the sheltering place of many aquatic species migrating from the sea and freshwater bodies. Besides, there are many types of fish, shrimp, and crab using directly the water grass as the feed.

In addition, there are also other ecological sub-systems with the soft bottom, agricultural ecological sub-system and in particular, mangrove ecological sub-system (Ru Cha).

Chapter 3. STATUS OF FIXED FISHING GEARS

The water surface of Huong Tra District is adjacent to Thuan An Inlet and also receives the water from Huong River. The aquatic resource here abounds with various species with high-value ones like orange-spot rabbit fish, seabass, mullet, Penaeidae (*tôm he*), marine crab, etc and a rich fingerling source. Therefore, there are different types of capture activities undertaken there. Fixed fishing gears operated in the water surface of Huong Tra District include bottom net, stake trap and lift net.

3.1 Bottom net

There are deep canals and strong water flow suitable for the bottom net development so bottom net is the gear that is commonly practiced in this lagoon inlet. Thuan An Inlet was cleared in the storm of 19 September 1904 (Thua Thien Hue monography, Social and Scientific Publishing House 2005). According to the fishermen of Hai Duong Commune, bottom nets were established not long after that and so far have been expanded.

The aggregated data from the master plan of capture fisheries in Thua Thien Hue Lagoon shows that in 2003, there are 175 bottom net units in Huong Tra District. According to the most recent survey (in 2009) with the participation of Huong Tra DARD, Huong Phong and Hai Duong CPCs and Fisheries Associations, the number of bottom nets of the whole Huong Tra District is up to 368 units (an increase of 193 units in comparison with 2003). Bottom nets are distributed on 21 rows in deep canals; there are many mouths in each row. Some rows with 44 mouths occupy almost the width of the lagoon. Each bottom net mouth is 8-14m wide and the minimum distance between two adjacent rows is 300m and more (see the map of bottom net status in Annex 1).



Figure 4. Bottom net in Huong Tra Lagoon

Table 2. Data on the bottom net distribution in Huong Tra

Sno.	FA, Commune	Unit	Total
I	Hải Dương	mouth	235
1	Hương Giang	mouth	55
2	Thượng Tây	mouth	52
3	Vĩnh Trị	mouth	122
4	CPC	mouth	6
II	Hương Phong	mouth	133
1	Đông Phong	mouth	105
2	Đông Hòa	mouth	28
III	Hương Trà	mouth	368

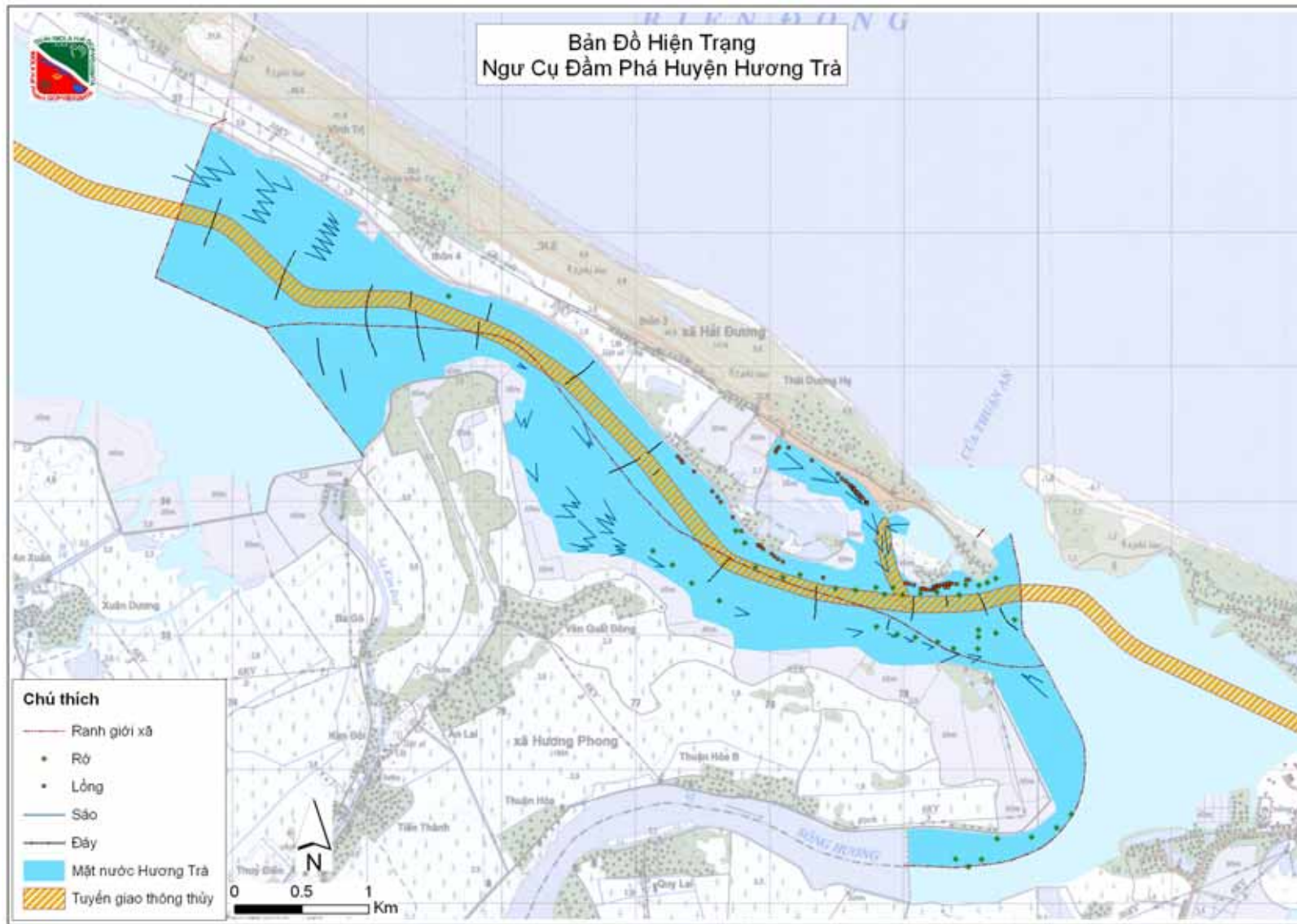
(Source: IMOLA 2009)

The number of bottom nets is as follows:

- a) Households (HH) with 1-2 mouths: 112 HH (75%)
- b) HH with 3-4 mouths: 23 HH (16%), mainly in rows of Vinh Tri Village, Hai Duong Commune and rows of Van Quat Dong Village, Huong Phong Commune
- c) HH with 5-8 mouths: 13 HH (9%), mainly in rows of Vinh Tri Village, Hai Duong Commune and rows of Van Quat Dong Village, Huong Phong Commune
- d) HH from Quang Dien District: 25 HH (17%), mainly in rows of Vinh Tri Village, Hai Duong Commune and rows of Van Quat Dong Village, Huong Phong Commune

Besides the increase of gear number, net mesh size for exploitation becomes smaller. At the moment, the mesh size of a bottom net ending part is $2a=4-6\text{mm}$ (while in the provincial regulation, it is $2a=18\text{mm}$).

The increase of bottom nets is in line with the general tendency of capture fisheries in the whole province. The increasing population and pressure of the socio-economic development and poor physical and spiritual life are factors leading to the quick development of different gears in the lagoon.



3.2 Stake trap

Stake trap in Huong Tra District does not develop with the big number as in Cau Hai Lagoon (Phu Loc District) partly because of the bottom topography and the water flow is unsuitable for the development of stake traps. The data from the master plan of capture fisheries in Thua Thien Hue Lagoon shows that in 2003, there were 57 stake traps in Huong Tra District. According to the survey in 2009, there were 44 stake traps in the District (a reduction of 13 units in comparison with 2003). Stake traps are distributed in the area adjacent to the Vinh Tri Village, Hai Duong Commune where the bottom is quite flat and the water flow is medium. The remained units are distributed in Van Quat Dong and Thuan Hoa Villages, Huong Phong Commune (see the fixed fishing gear status map in Annex 2). A stake trap size here is not so big as in Cau Hai Lagoon; most of wings have the length of less than 350m and traps have the mouths of less than 100m. The net mesh size becomes smaller and smaller. Currently, the net of the stake trap (shrimp and fish collecting part) has the size of $2a=6-10\text{mm}$ (the Province regulation: $2a=18\text{mm}$). Most of households own one stake trap/HH.

Table 3. Stake trap data in Huong Tra District

Sno.	FA, Commune	Unit	Total
I	Hải Dương	unit	22
1	Hương Giang FA	unit	4
2	Thượng Tây FA	unit	1
3	Vĩnh Trị FA	unit	14
4	CPC	unit	3
II	Hương Phong	unit	22
1	Đông Phong FA	unit	15
2	Đông Hòa FA	unit	7
III	Hương Trà	unit	44

(Source: IMOLA 2009)

3.3 Lift net

The water surface of Huong Tra District is also adjacent to the sea inlet, suitable for the growth of lift net. The data from the Master plan of capture fisheries in Thua Thien Hue Lagoon in 2003 shows that there are 21 lift nets in Huong Tra District. According to a survey in 2009, the number of lift nets of Huong Tra District is 40 units (an increase of 19 units in comparison with 2003). Lift nets are concentrated in Thai Duong Ha Nam and Thai Duong Thuong Tay villages, Hai Duong Commune and Thuan Hoa Village, Huong Phong Commune (see the fixed fishing gear status map in Annex 2). Most of households only own one unit/HH. The net mesh size for capture is $2a=6-10\text{mm}$ (Province regulation: $2a=18\text{mm}$).



Figure 6. Lift net in Huong Tra District

Table 4. Lift net status in Huong Tra

Sno.	FA, commune	Unit	Total
I	Hải Dương	unit	26
1	Huong Giang FA	unit	18
2	Thượng Tây FA	unit	7
3	Vĩnh Trị FA	unit	1
II	Hương Phong	unit	14
1	Đông Phong FA	unit	4
2	Đông Hòa FA	unit	10
III	Hương Trà	unit	40

(Source: IMOLA 2009)

3.4 Shortcoming of fixed fishing gear current distribution and use

- a) Many bottom nets violate the waterway (108 units, occupying 29.3%); some gears lie within the coastal buffer and commune boundary buffer
- b) Obstruct the water flow and movement of aquatic species. The width of the lagoon is small; bottom nets increase in number and violate the waterways, obstructing the water exchange between Tam Giang Lagoon and the sea. The thick distribution of bottom rows has prevented the movement of aquatic species from the sea to Tam Giang Lagoon and vice versa
- c) Nursing grounds have not been planned and protected. There are a lot of seagrass carpets in the waterways of Huong Tra District, with the suitable environment, creating the shelter for aquatic species to move from the sea to sheltering place for generation and growth. Therefore, fisheries protection sub-zones need to be set up with the specific regulation to protect the abundant natural resource there
- d) The specific zones have not been established; and the conflicts among gears take place regularly, in particular between mobile and fixed fishing gears
- e) Stake trap arrangement is not in line with the province regulation; many gears are distributed too close and the distance between tow adjacent wings is only 5-6m
- f) The net with very small mesh size is used for exploitation (particularly bottom net, 2a=4-6mm). Most of aquatic species migrated from the sea to Tam Giang Lagoon are caught by bottom net rows near the lagoon mouth. This has caused some impacts on the aquatic resources of Tam Giang Lagoon. In the research namely establishment of the experimental formula to evaluate the potential of aquatic resources in Thua Thien Hue Lagoon”, Mr. Le Van Mien and his co-workers make a conclusion that the quality of captured products from the bottom nets are very poor (11g/unit or 87.6 units/kg), number of larvae (shrimp, crab and small fish) caused death by the bottom net each year is more than half a billion units. Therefore, the improvement of the net mesh size plays a significant role, particularly in bottom nets.

Chapter 4. PLANNING OF FIXED FISHING GEARS IN HUONG TRA DISTRICT LAGOON

4.1 Background for planning

4.1.1 Development need of the fishing community

The real need of the community using the aquatic resource is reflected via the fisheries production plans of FAs.

4.1.2 Legal background

Planning is a part of the management process and the management can not be separated from the current State law. Therefore, the planning shall be based on the current law and social relationship on the use of natural resources and aquatic resources should be adjusted. The planning will forecast for a long run but shall comply with the legal regulations.

Therefore, the allocation and rearrangement of fixed fishing gears shall rely on the law system on the fisheries management and regulations of related parties like waterway and environment from the central to local levels. Due attention should be paid to:

- Ordinance on exploitation and protection of irrigation works no 32/2001/PL-UBTVQH10 issued by the National Assembly's Standing Committee dated 14 April 2001
- Vietnam Fisheries Law (17/2003/QH11)
- The Decision No.347/QD, dated 23 May 1992, by the Government Committee for Sciences regarding standards for technical classification of inland waterways;
- Integrated management of fisheries exploitation management in Thua Thien Hue Lagoon to 2010, issued in line with the Decision 3677/QD-UB, dated 25 October, 2004 by Thua Thien Hue Provincial People's Committee
- Regulation on management of fisheries exploitation in Thua Thien Hue Lagoon, issued with the Decision 4260/2005/QD-UB dated 19 December, 2005 by the Thua Thien Hue Provincial People's Committee
- The plan for the Decision 1955/QD-TTg dated 27 November 2009 by the Prime Minister on the Project namely the socio-economic development of Tam Giang-Cau Hai Lagoon, Thua Thien Hue Province
- The Thua Thien Hue decisions on establishment of fisheries protection zones

Besides, the plan building depends on some important contents as follows:

- Scientific studies on the lagoon (environment, resources, ecosystem, nursing grounds)

The relationship among zones means is to maintain the perfectness on the role of the lagoon ecological systems; causing no injuries to the service value and their cohesion. This requires the zoning of functional sub-zones and optimal solutions should be based on the ecological system

- Indigenous knowledge

- Community conventions (FAs)
- Level of gear impact on the lagoon environment

4.2 Planning perspectives

- a) Harmony in the protection of the ecology, environment, natural resources and the economic development and stabilization of poor farmers in the lagoon
- b) Socialization of the lagoon natural resources
- c) Distribution the system of fixed fishing gears with the appropriate exploitation capacity for the sustainable production
- d) Ensuring the justice, democracy and in line with the State policy

4.3 Zoning the functional sub-zones and planning the fixed fishing gears

Functional sub-zone zoning is regarded as a necessary tool to present the use approach according to the functions of the resource system in the lagoon. The water surface of Huong Tra District lagoon is split into specific functional sub-zones. In each sub-zone, there will be regulations on the allowed/prohibited gears, operation manner, and period to ensure use of the lagoon resources effectively in terms of economy, culture and society while protecting the environment and ecology. Therefore, the rearrangement of the fixed fishing gears based on the functional sub-zones will respond to the need of integrated management plan and should be scientific and highly feasible.

The waterway of Huong Tra District is divided into different functional sub-zones as follows:

Table 5. Sub-zones in Huong District

Zone	Stipulation
Waterway	In the lagoon - Central route: 120m - Local route: 100m <i>No stake trap, bottom net, lift net and aquaculture facilities shall be installed</i>
Coastal buffer	Stay 50m from the shore (Provincial stipulation: at least 50m) <i>No stake trap or bottom net shall be allowed</i>
Commune boundary buffer	Width of 50m(each side: 25m) <i>No stake trap, bottom net, lift net and aquaculture facilities shall be installed</i>
Fisheries conservation sub-zones	<i>No stake trap, bottom net, lift net and aquaculture facilities shall be installed</i>
Bottom net sub-zone	<i>Exclusive for bottom nets</i>
Stake trap sub-zone	<i>Exclusive for stake trap</i>
Fish cage sub-zone	<i>Exclusive for fish cage culture</i>
FAD sub-zone	<i>Exclusive for FAD</i>
Common fishing sub-zone	<i>Open for lift net and mobile fishing</i>

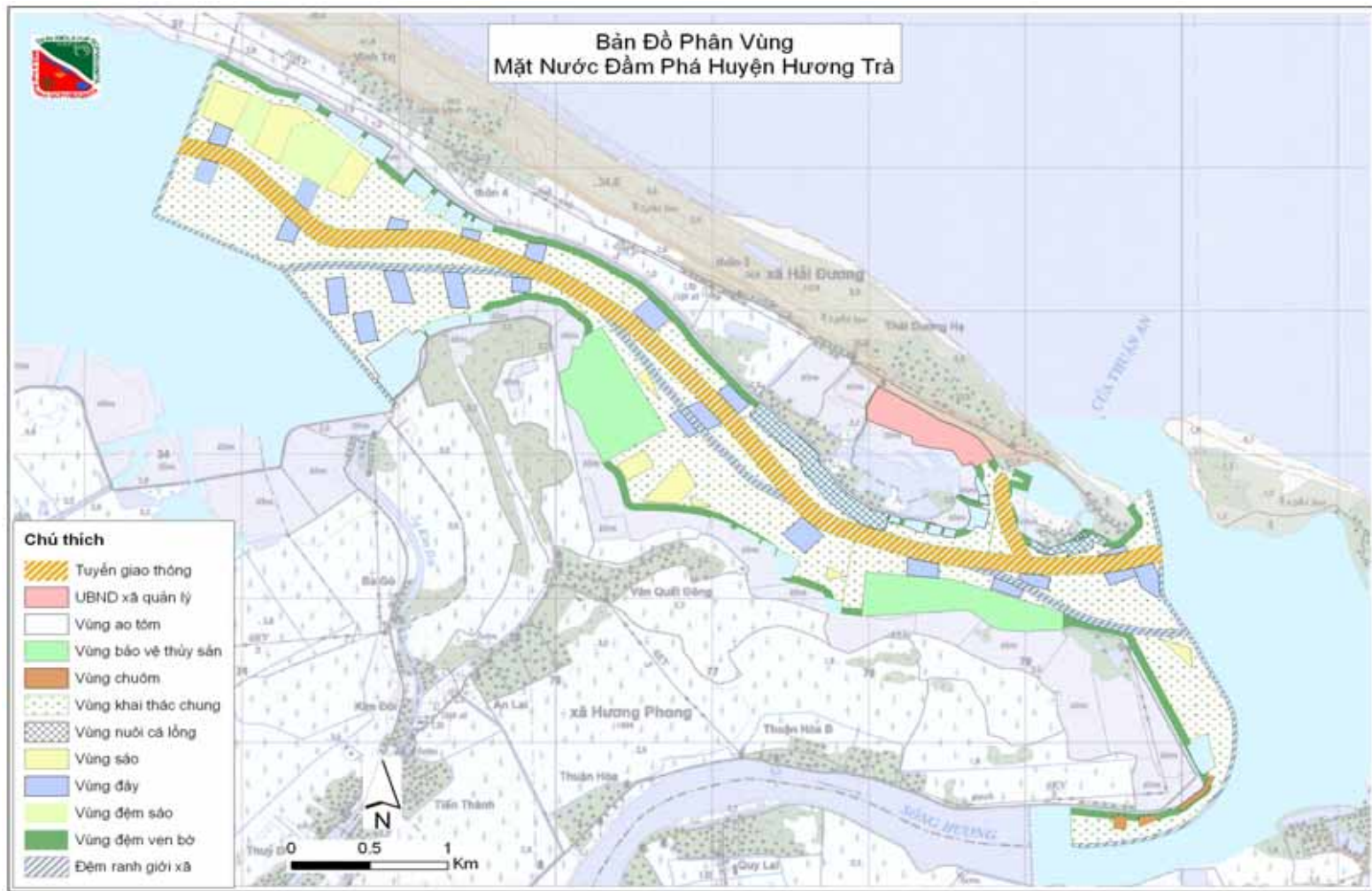


Figure 7. Map of planned fixed fishing gear rearrangement in sub-zones in Huong Tra

4.3.1 Waterway sub-zone

The identification of the waterways is based on the official coordinates provided by the Division of Waterway, which is under the Provincial Department of Transport. The width of the national route is 120m and of the local route is 100m in Tam Giang Lagoon. This width includes the core and waterway buffer, in line with the State regulation (347/QD, dated 23 May 1992). The area of this waterway sub-zone is 94.3 ha

4.3.2 Shore buffer

The shore buffer identified upon the proposal of the Huong Tra DPC is 50m (Decision 4260/2005/QD-UBND, dated 19 December 2005) specifies the minimum coastal buffer in Tam Giang is 50m). The shore buffer covers 46.3 ha

4.3.3 Commune boundary buffer

The commune boundary is identified based on the official coordinates issued by the DPC (map 364 with the scale of 1:25,000). The buffer of 50m (25m each side) is applied in Huong Phong and Hai Duong Communes upon the proposal of Huong Tra District. The area of the commune buffer is 40.0 ha.

4.3.4 Fisheries conservation sub-zone

- **Con Sao area:** the previous surveys show that the area of seagrass is relatively large and the fingerlings of aquatic species concentrate here with remarkably high density. This area has been proposed by the Sub-Institute of Oceanography (in the Research of nursing grounds of fisheries economic species of Thua Thien Hue Lagoon in 2000) to be the limited conservation area. In 2009, Con Sao has been put in the list of fisheries protection zones. This area is surveyed again by the IMER in 2010 and recommended as the protection zones with its important values such as sea grass, seaweed, spawning fingerlings of shrimp, orange-spotted rabbit fish, crab, stripe clam (the Report on assessment of conservation potentials of lagoon resources and environment in Tam Giang – Cau Hai, Thua Thien Hue, IMOLA Project, 2010). The survey of 2010 involved the participation of Sub-DECAFIREP, Huong Tra DARD, Huong Phong CPC and FAs, defining the area of the Con Sao conservation area of around 29.5 ha (see the zoning map in Annex 4).
- **Con Say area:** In the past, there used to exist the Con Say with the area of 1.5ha, surrounded by seagrass carpets, which are the suitable sheltering places for aquatic species. As time passed, with the impact of the nature (storms, floods and water current alteration), Con Say was eroded and is no more available. Therefore, the water body is relatively shallow and flat. The survey of 2010 shows that the seaweed carpets were available there. According to fishermen of Huong Phong Commune, many kinds of shrimps, and fingerlings can be found in this area from December to May (solar calendar). Therefore, various fisheries activities are undertaken here to harvest shrimp and fish fingerlings.

This area is surveyed again by the IMER in 2010 and recommended as the protection zone with its important values such as sea grass, seaweed, spawning fingerlings of shrimp, orange-spotted rabbit fish, crab, stripe clam (the Report on assessment of conservation potentials of lagoon resources and environment in Tam Giang – Cau Hai, Thua Thien Hue, IMOLA

Project, 2010). The survey of 2010, which involved the participation of the Sub-DECAFIREP, Huong Tra DARD, Huong Phong CPC and FAs, defines the the area of the Con Say to be 33.8 ha (see the zoning map in Annex 4). There are only two stake traps so the number of stake trap units to be removed is small. The location of the Con Say fisheries protection area to the plan and assigning it to the responsibility of the Fisheries Association is a necessary approach for protection of aquatic resources in the area and in Tam Giang Lagoon.

The strictly protected zones should be protected with the detailed regulations:

a) Completely prohibit economic activities making adverse impact on the natural aquatic resources and environment including:

- Capture fisheries (hydro-biological fauna and flora)
- Aquaculture (hydro-biological fauna and flora)
- Construct production works (including houses)

b) Activities with conditions:

- Capture fisheries activities for the purpose of scientific studying and activities of “Enemy-inflicted destruction” have to have permit issued by Sub-DECAFIREP as per regulation.

- Waterway transport activities will be allowed to come in and out but not to stop/park the boat in the protection zone;

- Eco-tourism activities to be permitted with involvement and supervision of local fishermen community.

4.3.5 Bottom net

Bottom net is exclusive for bottom net operation and no capture fisheries and aquaculture activities are allowed.

Stipulation on the bottom net distribution:

- a) Bottom net shall not violate the waterway, fisheries conservation areas, coastal buffer and commune boundary buffer
- b) The minimum distance between two adjacent rows shall be 400m
- c) The maximum length of each bottom net row shall not exceed two third of the lagoon width
- d) The number of non-removed gears shall not be increased
- e) The maximum width of each allocated bottom net shall be 10m
- f) The minimum net mesh size for the ending part shall be $2a=18\text{mm}$
- g) The bottom net sub-zone is established in line with the regulation by the Province (that stipulates the minimum distance of mobile gears from fixed fishing gears to be 20m) and regulations of Fisheries Associations (that stipulate the minimum distance of mobile gears from bottom nets to be 100m). Therefore, each bottom net sub-zone includes the bottom net row with the size of 20-100m from the bottom net pole and mouth.

Table 6. Bottom net rearrangement plan of Huong Tra District

No.	FA, Commune	Unit	Total	Violating gear(*)		Reallocated gear		Removed gears	
				Number	%			Total	%
I	Hải Dương	Unit	235	126	53.6	5	2.1	121	51.5
1	Huong Giang FA	unit	55	25	45.5	0	0.0	25	45.5
2	Thượng Tây FA	unit	67	54.9	53.8	0	0.0	28	53.8
3	Vĩnh Trị FA	unit	122	52	42.6	5	4.1	62	50.8
4	CPC	unit	6	6	100.0	0	0.0	6	100.0
II	Hương Phong	unit	133	30	22.6	0	0	30	22.6
1	Đông Phong FA	unit	105	20	19.0	0	0.0	20	19.0
2	Đông Hòa FA	unit	28	10	35.7	0	0.0	10	35.7
III	Hương Trà	Unit	368	156	42.4	5	1.4	151	41.0

(*): Gears violating zones: waterway 120m, fisheries protection zone, shore buffer 50m, commune boundary buffer 25m to each side, to be cleared for better water circulation

Bottom nets to be removed are mainly violating the waterways, or lying in closed areas for bottom net operation such as the fisheries conservation areas, in the shore buffer and commune boundary buffer. Besides, some bottom nets in rows 5 and 7 are removed to facilitate the water flow. 6 bottom net mouths on the row adjacent the shore on row 3 will be removed because they do not operate effectively. Row 21 (Thuan An Inlet) will be also removed to ensure the safety for the waterways and minimize the exploitation of fingerlings.

The total 368 bottom nets of the whole district will be reduced to 217 units (-151 units), allocated in 23 sub-zones (see the bottom net planning map in Annex 3). The coordinates of

each bottom net is defined as the ones of the mouth poles. The number of bottom nets in each row is as follows:

Row code	Number of allowed bottom nets	Row code	Number of allowed bottom nets
Di	11	Dxiii	9
Dii	8	Dxiv	4
Diii	8	Dxv	9
Div	13	Dxvi	6
Dv	14	Dxvii	11
Dvi	12	Dxviii	11
Dvii	18	Dxix	7
Dviii	4	Dxx	6
Dix	5	Dxxi	4
Dx	18	Dxxii	2
Dxi	8	Dxxiii	18
Dxii	11	Total	217

A reduction of 151 mouths (41%) in the whole district has influenced remarkably the socio-economic life of the fishing community, in particular Thuong Tay FA (-53.8%), Huong Giang (-45.5%) and Vinh Tri (-50.8%). It is necessary to have some livelihood alteration for some households to minimize their difficulty in life. The shifted activities should be separated from the lagoon activities to reduce the pressure, like:

- Ecological tourism: the Huong Tra District Lagoon has a great potential for organizing tourism activities. It is possible to establish some visiting tours like fishing, enjoying some specialties of the lagoon, ecological sleeping (*ngủ sinh thái*) ???...
- As the water surface of Huong Tra is adjacent to Thuan An Inlet, it is necessary to have the policy to encourage part of the population (offshore fishing). Offshore fishing has been effectively carried out in some communes like Phu Thuan, Loc Tri, Loc Binh, Phu Loc Town, etc.
- Supporting the vocational training and generating jobs for young people. If this works, the pressure of activities on the lagoon will be decreased in the future

Due to the negative impacts of the bottom net mesh size on the lagoon natural resources (as mentioned in Part 3.4), the improvement of the bottom net mesh size should be put as a priority.

4.3.6 Stake trap sub-zone

The stake trap sub-zones are exclusive area for stake trap operation; no capture or aquaculture activities are allowed in these sub-zones.

Stipulations on the stake traps:

- a) Stake trap shall not violate the waterway, fisheries conservation areas, shore buffer and commune boundary buffer
- b) The minimum distance between two adjacent rows shall be 150m
- c) The minimum distance between two adjacent trap wings shall be 10m

- d) The maximum length of the trap wing shall be 350m
- e) Each stake trap shall have a V shape
- f) The minimum net mesh size (of the ending part) shall be $2a=18\text{mm}$

Table 7. Stake trap rearrangement plan in Huong Tra District

Sno.	FA, commune	Unit	Total	Violating gear(*)		Reallocated gear		Removed gear	
				Number	%	Number	%	Number	%
I	Hải Dương	unit	22	9	40.9	11	50.0	10	45.5
1	Huong Giang FA	unit	4	4	100.0	0	0.0	4	100.0
2	Thượng Tây FA	unit	1	1	100.0	0	0.0	1	100.0
3	Vĩnh Trì FA	unit	14	1	7.1	11	78.6	2	14.3
4	CPC	unit	3	3	100.0		0.0	3	100.0
II	Hương Phong	unit	22	15	68.2	8	36.4	12	54.5
1	Đông Phong FA	unit	15	9	60.0	8	53.3	6	40.0
2	Đông Hòa FA	unit	7	6	85.7		0.0	6	85.7
III	Hương Trà	unit	44	24	54.5	19	43.2	22	50.0

(*) Total violating gears

Waterway 120m; nursing ground; shore buffer 50m; commune boundary buffer 25m

Stake traps in the Hai Duong market canal will be removed to:

- Generate the clearance for the waterway; in particular, this is the sheltering place for fishing vessels in the rainy and stormy seasons
- Enhance the water circulation, minimize the pollution in the Hai Duong canal, and create cleaner water in the interior canals

Some stake traps allocated in the water surface of Dong Phong and Dong Hoa FAs are to be removed due to the poor efficiency and violation of conservation areas. The total number of stake traps of the whole district is 44 units, which will be reduced to 22 units after the rearrangement. These 22 units will be allocated in 10 sub-zones (see the zoning map in Annex 4). The number of stake traps in each sub-zone is presented in the following table.

Stake trap sub-zone code	Number of allowed stake traps
NSi	2
NSii	5
NSiii	5
NSiv	1
NSv	1
NSvi	2
NSvii	3
NSviii	1
NSix	1
NSx	1
TOTAL	22

Stake trap sub-zones Nsi, Nsii, Nsiii in Vinh Tri Village, Hai Duong Commune are allocated in the buffer zone which is the water surface between stake trap rows (illustrated on the

zoning map, Annex 4). According to the agreement of the FA, this sub-zone is not available for the operation of capture fisheries.

4.3.7 Fish cage sub-zone

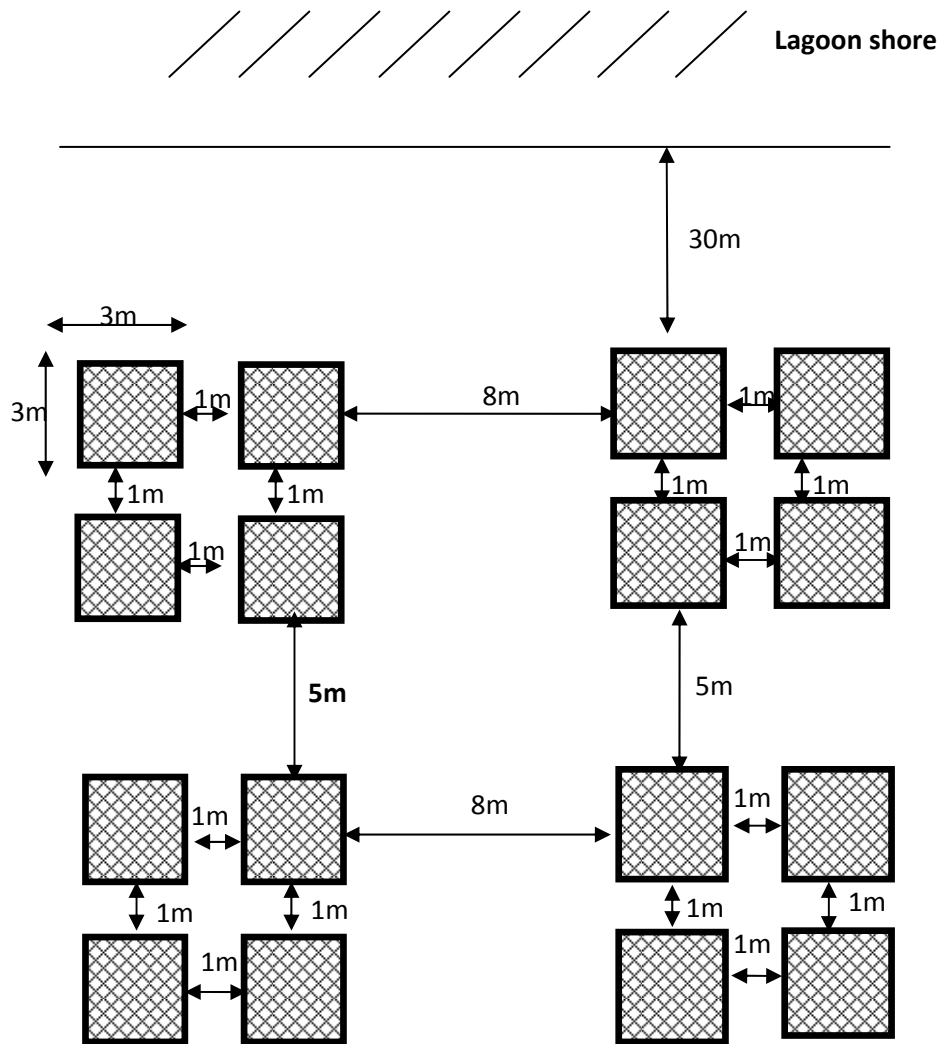
Hai Duong Commune is adjacent to Thuan An Inlet, Thai Duong Ha Nam and Thai Duong Thuong Tay villages, there are many advantageous features favorable for the fish cage culture development like depth, salinity, water flow and dissolved oxygen, and so on. Therefore, the fish cage culture was established in 2003, and has been developed since 2006. Nowadays, there are nearly 200 households in Hai Duong Commune engaged in fish cage culture with major species including snapper, grouper, orange-spot rabbit fish, spotted scat, seabass, etc. The fingerling source comes from the natural capture from bottom nets and fixed lift nets. In general, fish cage culture brings about stable income, which plays a significant role in improving the life of fishermen. According to the policy of the Province, the fish cage culture area shall not be expanded. Therefore, fish cage culture areas in Huong Tra District is put into the plan based on the status of the current culture area. No other fishing activities and aquaculture are allowed to be practiced in this fish cage area. The fish cage culture in Huong Tra District is planned in two sub-zones (see the zoning map in Annex 4) as follows:
is planned into two sub-zones:

- Sub-zone 1 is in the water surface of Huong Giang FA with the area of 3.2 ha
- Sub-zone 2 is in the water surface of Thuong Tay FA with the area of 14.2 ha

In the last time, some fish cages are installed in the canal to Hai Duong Market. This is a shallow, poorly circulated and thus unsuitable for fish cage culture. The use of trash fish for fish cage culture increases the risks of environmental pollution in the market canal and the adjacent aquaculture area. Therefore, it is necessary to move these cages to the fish cage sub-zone of Thuong Tay FA.

In the fish cage culture, due attention should be paid to the rearrangement of cages and rafts to ensure the water circulation, encourage fishermen to use a new kind of feed to replace the trash fish. In each culture area, fisheries associations set up the plan for the distribution of canals for boat travelling and regulation on the cage layout. The details are presented in the fishing rights allocation document submitted to the DPC for approval.

Fish cage lay-out



4.3.8 FAD sub-zone

FAD sub-zones are distributed along Huong River mouth, from Thao Long dam towards the lagoon (see the zoning map in Annex 4). The bottom bed topography is relatively flat with the medium depth. The water flow is not big since the Thao Long dam was closed and suitable for FAD operation. The area of FAD sub-zones is not big and does not impact the water flow in this water body. The development of FAD in this area hopefully creates the chance for livelihood conversion for some households practicing eel raking by motorized boats.

The FAD sub-zone is an exclusive area for FAD operation and unavailable for other capture activities and aquaculture.

Stipulations on the FAD installation:

- a) FAD shall not violate the waterway, fisheries conservation sub-zone and commune boundary buffer
- b) The maximum size of an FAD shall be 150m²
- c) The minimum distance between two adjacent FAD shall be 50m

4.3.9 Common fishing sub-zone

In principle, the common fishing sub-zone is in principle all water surfaces that are not covered by any of the above functional sub-zones. As lift nets distribute scattered so there is no specific sub-zone for this gear. Therefore, lift nets are distributed in the common fishing sub-zone together with other mobile gears. The position of each unit is identified according to the specific coordinate (see the zoning map in Annex 4). The operation of each kind of gear in the common fishing sub-zone is regulated in details in the fishing rights allocation document endorsed by the DPC.

Stipulations on the lift net distribution:

- a) Lift net shall not violate the waterway, fisheries conservation sub-zone and commune boundary buffer
- b) The maximum size of a lift net shall be 25m (one wing)
- c) The minimum distance between two traps shall be 80m
- d) The minimum net mesh size shall be $2a=18\text{mm}$

Table 08. Lift net rearrangement plan in Huong Tra District

Sno.	FA, Commune	Unit	Total	Violating gear(*)		Reallocated gear		Removed gear	
				Number	%	Number	%	Number	%
I	Hải Dương	unit	26	8	30.8	12	42.3	1	3.8
1	Hương Giang FA	unit	18	4	22.2	5	22.2	1	5.6
2	Thượng Tây FA	unit	7	4	57.1	7	100.0	0	0.0
3	Vĩnh Trị FA	unit	1	0	0.0	0	0.0	0	0.0
II	Hương Phong	unit	14	0	0.0	0	0.0	0	0
1	Đông Phong FA	unit	4	0	0.0	0	0.0	0	0.0
2	Đông Hòa FA	unit	10	0	0.0	0	0.0	0	0.0
III	Hương Trà	unit	40	8	20.0	12	27.5	1	2.5

(*)

Waterway 120m; nursing ground; buffer zone 25m each side

Fixed lift net has a long history in the lagoon and has little impact on the lagoon resource and environment like obstructing the water flow, destroying the bottom beds and causing the environmental pollution. Therefore, this gear should be maintained. All lift nets violating the waterway, and commune boundary buffer are moved to the common fishing sub-zone. Only one lift net was removed as no space can be found to allocate this gear.

In general, the lagoon water surface of the entire area after the planning gives more space. The sub-zones for fixed fishing ears and fish cage culture do not occupy a large area and the water surface free of fixed fishing gear is more than 80%.

Table 9. Area of each functional sub-zone

Sno.	Zone	Area (ha)	%
1	Waterway	94.3	13.8
2	Shore buffer (50m)	46.3	6.8
3	Commune boundary buffer (50m)	40.0	5.8
4	Nursing ground of Con Sao, Con Te	29.5	4.3
5	Nursing ground of Con Say	33.8	4.9
6	Bottom net sub-zone	42.3	6.2
7	Stake trap sub-zone	49.1	7.2
8	Fish cage culture sub-zone	17.4	2.5
9	FAD sub-zone	2.5	0.4
10	Common fishing sub-zone	330.0	48.2
	Total	685.2	

4.3.10 Fingerling harvest

The exploitation of fingerlings is a sensitive issue because it involves the balance between protection of resources and fishermen livelihood. To protect the natural resources, first of all, it is necessary to safeguard the fingerlings, allowing them to grow to the harvest size. Nowadays, fingerlings provided to aquaculture are mainly from lagoon capture, with species including grouper, snapper, spotted scat, orange-spot rabbit fish, and so on. In the meanwhile, fingerlings for fish cage culture are from bottom nets and lift nets.

In recent years, the polyculture is encouraged in the whole province to replace the monoculture of shrimps to reduce the risks and diseases. The practice has shown that the polyculture has brought about certain economic effectiveness and favored by the fishermen. Fingerlings (mainly orange-spot rabbit fish and white-spot rabbit fish) provided for the low-tide area to practice the polyculture with shrimps is captured from bottom nets and lift nets.

Therefore, besides the protection of natural resources, it is necessary to maintain the livelihood of many aquaculture fishermen. The sub-department of Aquaculture many times presents research results showing that at different times in the year, fingerlings migrate to the sea with a significant amount. If the harvest is at a reasonable scale, it will give any negative impact on the lagoon resources. The issue behind this is to harvest fingerlings at a reasonable time and get the permission from the competent organization with the specific regulation on the monitoring and violation fining.

Fisheries Associations develop the plan for exploitation of fingerlings and submit it to the competent agencies for getting the license. The plan can be developed for each year based on the need and experience of the fingerling crop, with the following details:

- Captured species (red snapper, grouper, orange-spot and white-spot rabbit fishes)
- Fishing gears (bottom net, lift net, and so on)
- Harvest quantity
- Harvest time
- Minimum net mesh size (ending part)
- Monitoring schedule

The quota for fingerling exploitation is also to limit the status of current uncontrolled exploitation.

Above this the plan on fixed fishing gears in the Huong Tra lagoon area. It is proposed to PPC for soon consideration and approval for implementation, in order to contribute to lagoon environmental protection and life stabilization for the local lagoon people.

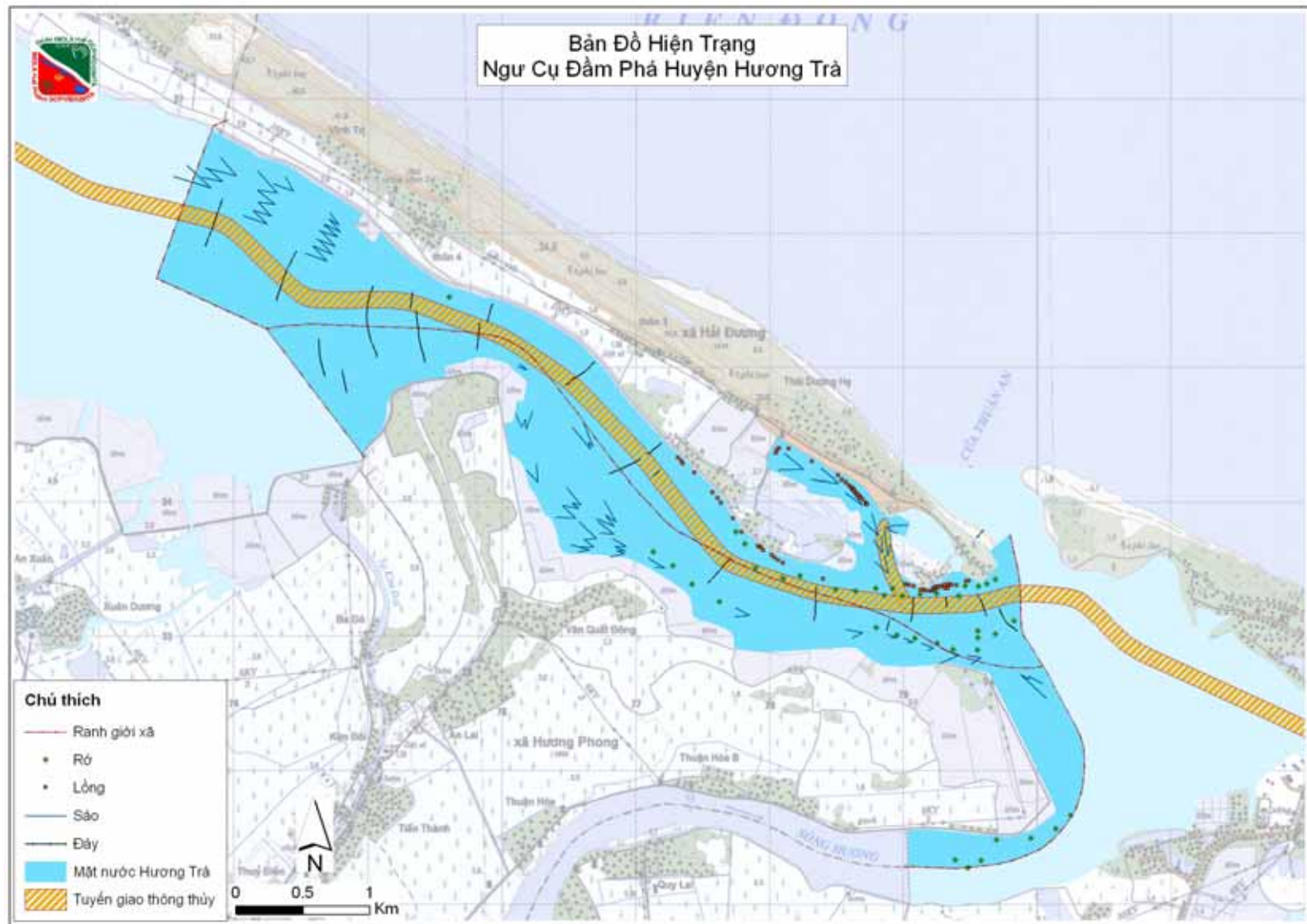
Recipients:
- PPC

**ON BEHALF OF DISTRICT PEOPLE'S
COMMITTEE
CHAIRMAN**

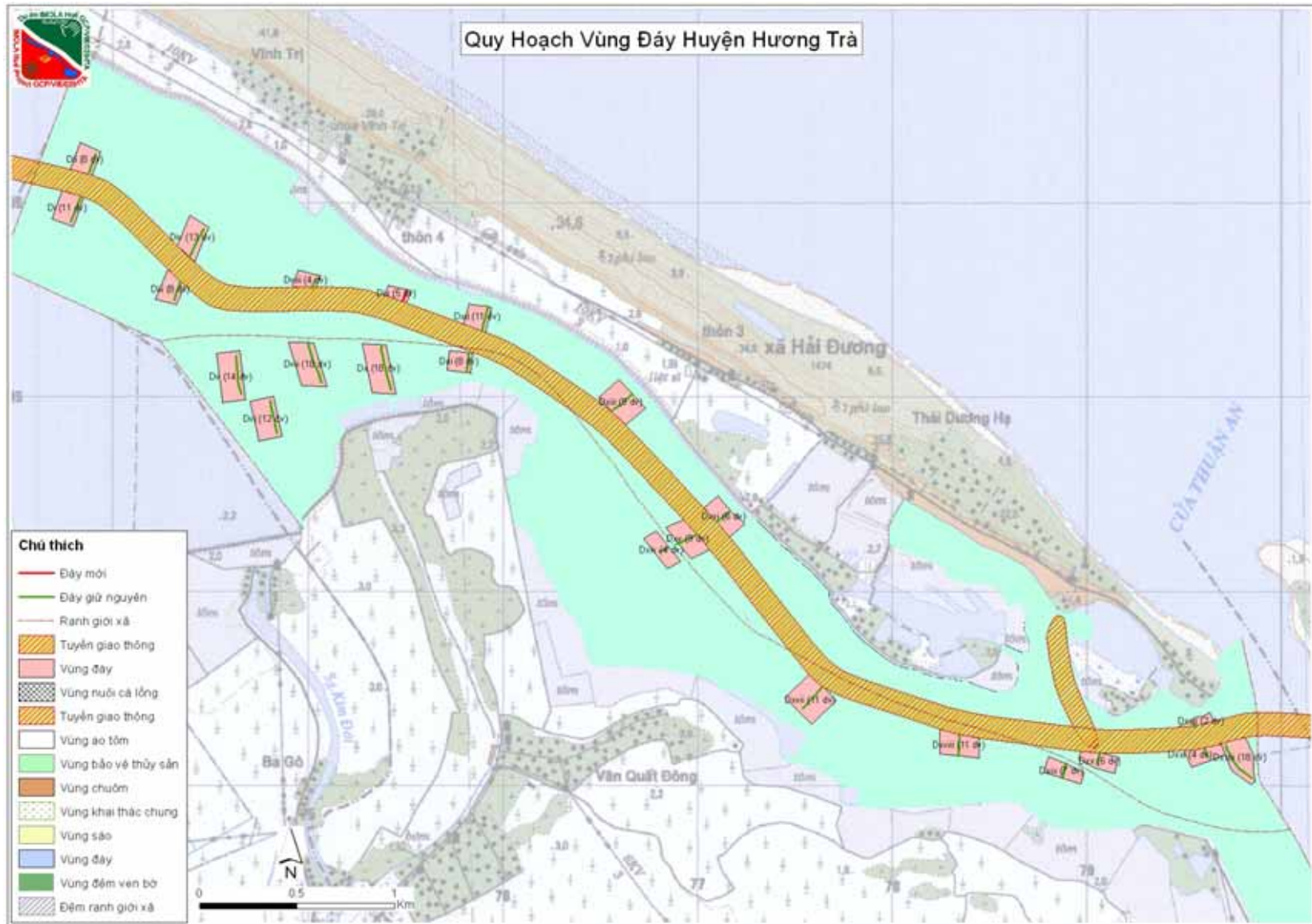
ANNEXES



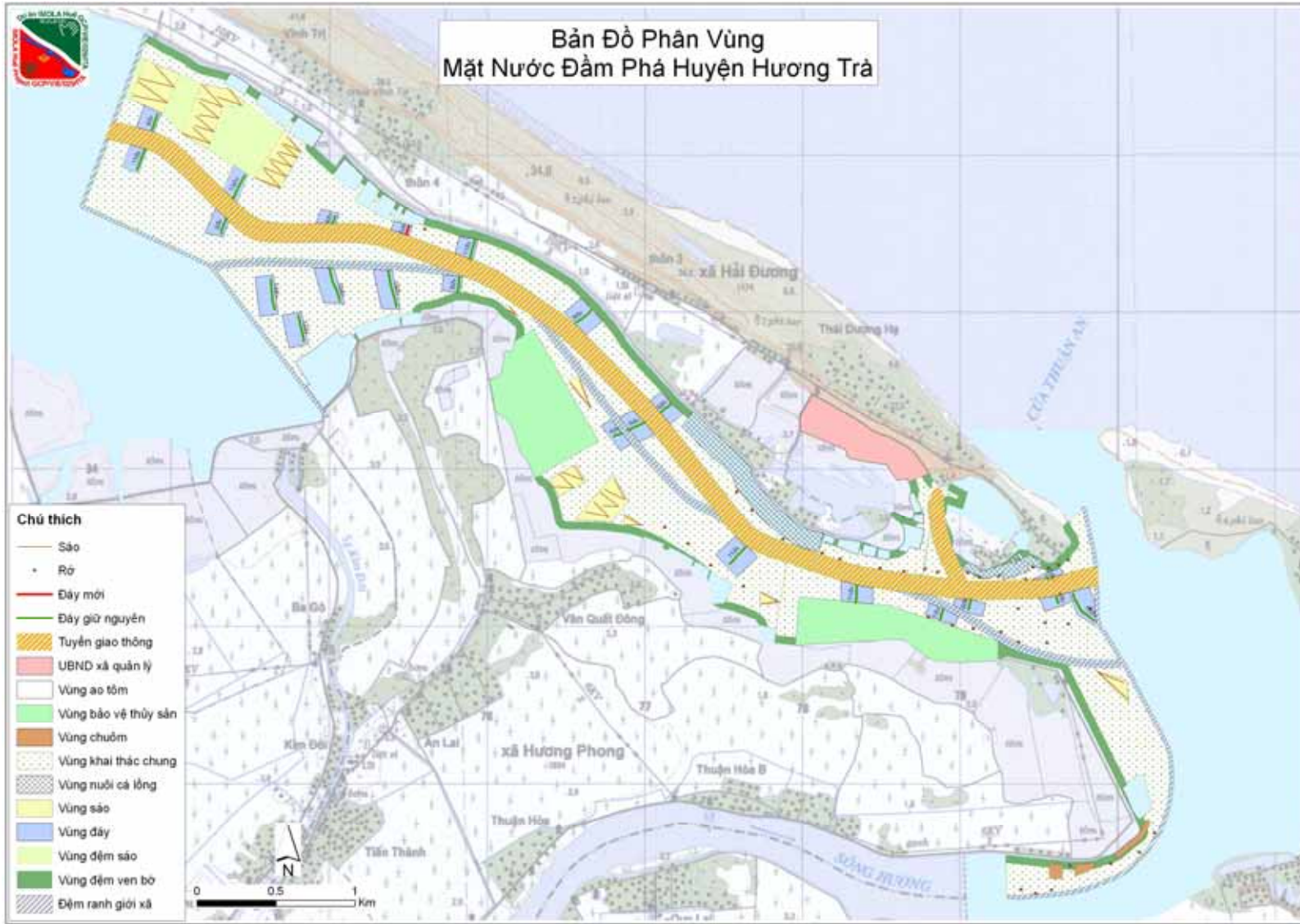
Annex 1. Bottom net status map of Huong Tra District (on A3 size)



Annex 2. Fixed fishing gear status map of Huong Tra District (on A3 size)



Annex 3. Planning map of bottom nets in Huong Tra District (on A3 size)



Annex 4. Zoning and fixed fishing gear allocation in the lagoon of Huong Tra District (on A3 size)

