

The Conservation Network of Horseshoe Crab *Tachypleus tridentatus* in Taiwan

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Abstract The horseshoe crab *Tachypleus tridentatus* once thrived in the west coast of Taiwan. We started our research on the horseshoe crabs when we discovered a few juveniles crawling on mudflats in Kinmen Island in 1996. However, after a decade's effort, the status of the horseshoe crab is still dangerously poor in Taiwan. The whole horseshoe crab conservation project could basically be described as a process of searching for missing links, not only in scientific understanding but also in many other social perspectives in order to construct the conservation network. The horseshoe crab has great value not only in economics but also in biodiversity, ecology, and the local culture of Taiwan. Thus, it adequately serves the role as a flagship species in coastal environments. An integrated approach to the conservation network has been formulated as a triadic framework, i.e., life history study, habitat requirement study, and community-based conservation action, along with six principles, including cultural concern, build-up of scientific knowledge, stakeholder organization, localization, input of younger generations, and industrialization (i.e., ecotourism).

1 Horseshoe Crabs in Taiwan History

In Taipei city there is a famous temple named Lungshan Temple. At the base of its left column at the front gate is a sculpted horseshoe crab (Fig. 1). In the Hokin dialect, the pronunciation for the word horseshoe crab is the same as that of "filial piety." Ancient Chinese have used this wise way to educate people, since filial piety is the foundation of their society. Moreover, in northern Taiwan, modern, local people still call Keelung harbor the horseshoe crab harbor, which at one time was home to many horseshoe crabs. Here is a poem describing the beautiful scene around this harbor:

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Fig. 1 This is a famous temple named Lungshan temple. At the base of its left column at the front gate is a carved horseshoe crab. In the Hokin dialect, the pronunciation for the word horseshoe crab is the same as that of “filial piety” as the foundation of our tradition

“Crisp light illuminates rooster hill after the rain,
Gentle sun shimmers on horseshoe-crab beach in the morning”.

Many interesting facts were found concerning horseshoe crabs in history, literature, colloquial language, and daily usage in Taiwan. For example, some places are named after the horseshoe crabs, such as horseshoe crab hill or village. Its shell was commonly used as a water ladle and as a large scoop for frying pans (Fig. 2). These utensils were named after the horseshoe crab, and even though the shell itself is no longer in use, the utensils still bear the name of the horseshoe crab. In Kinmen, shells were hung at the tops of doors and walls to protect the house from evil, or they were painted with the face of a tiger or with the faces of Chinese opera characters. The ova and meat were often consumed, and were even used to fertilize crops. There are several expressions using the Chinese word for horseshoe crabs to describe the close bond between husband and wife both in ancient Chinese poems and daily language. It is indeed an intimate connection between this organism and the lives of people.

Based on this information, although solid numbers of horseshoe crabs have not been counted, we believed that the horseshoe crab *Tachypleus tridentatus* must once have thrived on the west coast of Taiwan, including Kinmen and



Fig. 2 Horseshoe crabs have been extensively used in Taiwan. Its shell was commonly used as a water ladle or as a large scoop for frying pans

Peng-Hu Islands. Now, adults are only occasionally caught by trawling nets in the Taiwan Strait and people see them mostly in poor condition with broken book gills or torn legs in aquariums.

In 1996 we started our research on the horseshoe crabs when we discovered a few juveniles crawling on mudflats on Kinmen Island. After a decade of effort, the status of the horseshoe crab is still dangerously poor in Taiwan.

2 An Integrated Approach to the Conservation

The whole horseshoe crab conservation project could basically be described as a process of searching for missing links, not only in scientific understanding but also in many other social perspectives in order to construct the conservation network. Acknowledging the poor status of horseshoe crabs in Taiwan is not enough while conducting scientific research of horseshoe crabs. A difference has to be made in the real world, meeting with people, talking to local communities, and initiating some kind of social consciousness. Conservation cannot be achieved without the recognition and participation from local communities.

In order to make this difference, a scientist must first change his own beliefs and behavior in order to make changes in other people's minds and actions. Here is the way to do it based on the concept of 4P/4C (people, paper, publish, perish; community, communicate, cooperate, collapse). Many scientific researchers have

been trained to publish scientific papers. People keep telling them “you will have to publish papers or you will perish from scientific research.” In order to meet this demand, some scientists try to avoid dealing with people as much as they can. But in reality, we are people living together, forming a community and within this community, we should communicate with each other. In order to survive, all have to cooperate otherwise all will collapse. Based on this concept, a researcher can more easily reduce paper work and start to work with people in real life. Indeed, the concept in academia “Publish or Perish,” is too narrow and limited. In regard to conservation, it should be changed to “Cooperation or Collapse.” All of us have to try to cooperate or we may face the collapse of the ecosystem and human society.

In the natural ecosystem, there are three flows known as energy flow, matter flow, and information flow; however, when humans enter this virgin ecosystem, two flows are added: the money flow and the vote flow. Now the whole system is composed of these five flows. Natural science and social science should not be separated, but should be together; otherwise environmental problems cannot be solved. These days, the uneven distribution of money flow is the key issue in environmental protection. The purpose of the community empowerment is to let local people decide how to use their natural resources. By doing so, a consensus on environmental issues can be achieved. This is the vote flow.

2.1 Flagship Species

The horseshoe crab has great value, not only in economic terms but also in biodiversity, ecology, and the local culture of Taiwan. Thus, it adequately serves the role as a flagship species (Zacharias and Roff 2001) in coastal environments so that as long as its habitat is preserved or conserved, the entire community including the target flagship species and species dependent on that habitat are secured.

2.2 An Operating Triadic Framework Along With Six Principles

Conservation of the species habitat has been acknowledged to be much more effective than conservation of the species itself. The horseshoe crab needs three types of habitats: a high tidal zone consisting of coarse sand for spawning, an intertidal mudflat to be used as a nursery, and a shallow coastal zone for maturation. Therefore, integration of the marine coastal ecosystem with the socioeconomic system is demanded. Based on these habitat requirements, an operating framework for conducting conservation projects has been formulated. The framework is composed of three elements: life history, habitat, and community along with six principles: cultural concern, build-up of scientific

knowledge, stakeholder organization, localization, input of younger generations, and industrialization (i.e., ecotourism). This triad is indispensable to the conservation of the horseshoe crab because success obviously depends upon a healthy habitat, a participative community, as well as the knowledge of how to manage the conservation area and how to sustain economic growth resulting from the practices. The contents of these six principles are summarized in Table 1.

- Cultural concern: When we try to change people’s minds and persuade them to act within their community we must take into consideration the local culture and customs. In Chinese culture, we respect the elderly and the scholars, so I must present myself as an old scholar. I (C-PC) am only 62 but I act as if I am an older person so I can gain an advantage when dealing with them. Next, I dress in a more ragged, casual manner, so that they do not recognize me as the typical academic type. This allows me to fit in with the people more easily; as the saying goes, “birds of a feather flock together.” is the culture concern. There are many different cultures within each country so you have to be mindful of them and adapt accordingly.
- Scientific research is of course one fundamental necessity which prepares the ground work for any meaningful effort and discourse in the business of environmental protection, natural resources management, and other relevant activities.

Table 1 Six principles of promoting conservation projects

Principles	Contents
Cultural concern	To trace back the relationship between horseshoe crabs and Taiwanese ancestors To link people’s daily life to the health of the horseshoe crabs
Localization	To get local organization, both official and unofficial, and get communities involved To initiate public education programs
Stakeholder organization	To organize resources, manpower, expertise, and financial support from different sectors To form an organization or to help existing organizations to conduct relevant activities
Scientific knowledge	To carry out relevant research and surveys and to formulate management knowledge To transfer scientific knowledge to the locals To learn tacit knowledge from the local culture and traditional wisdom
Involvement of younger generations	To attract and encourage a younger generation to participate To instill an environmental awareness in the minds of students
Economic incentives	To discover and explore the potential attraction for ecotourism To assist the locals to develop an ecotour industry To formulate management plans

- Stakeholder organization: We have to get as many of the stakeholders together as we can. These include governmental sections, legislators, educators, researchers, local residents and so on. When they fight among themselves we have to let them fight so that we can listen and find solutions to the problems. If they do not talk then we do not have a chance to find out what the real problems are.
- Localization: The whole action should take place in the local community. Community has a broad definition as a gathering of people, like today we come together and sit here in a kind of community. We also empower each other; we share knowledge and concerns, then we try to solve the problems together. Yet here we emphasize on the local space-based ones. In order to go into the community you must take the people's lives into account. You must consider the economy in the area otherwise the people in the community may not be able to survive. You must also educate them so that they may empower themselves later. There are several aspects to empowering the people in the community: awards, patience, and action. From my experience awards are easy, being patient with them has worked so far, but getting them to take action has been the hard part. The skill is not easy to imprint onto the local community.
- Input of the younger generation: We need more young people involved in this kind of conservation work. Only with the constant engagement of fresh troops, it is able to keep sustainable management of these tasks that required long-term effort.
- Economic incentives: How to get the money while doing the conservation. Ecotourism is one way but not the only way. There are many different methods. One of the difficulties in promoting ecotourism is caused by several factors: it is less profitable and more time-consuming. This highlights the need for public education and propaganda. Only when people understand their health depends on a healthy environment, will they be willing to compromise their short-term interests for their long-term welfare. It is also important to inform people that the current pattern consumption and utilization of natural resources, construction and economic development will have devastating consequences on the natural environment irrespective of the expensive cost to repair, restore and rehabilitate the natural environment.

Horseshoe crab conservation is a means and not an end in itself. Hence, the three-stage goals have been formulated, as shown in Table 2. The goal was more than the conservation of horseshoe crab population itself, but the protection of environment as a whole. The ultimate goal is biodiversity conservation, rather than protection of a single flagship species. With the ultimate goal in mind, even though the primary role in the early stages is still restricted to the realm of scientific research, particularly to the biology of horseshoe crabs, many outreach and educational programs have been conducted. These have contributed to the public understanding of the relationship between living beings and their environment as well as to establishing local cooperation.

Table 2 The goals of promoting conservation in horseshoe crab project

The immediate goal: species conservation	
	To understand its basic biology
	Juvenile aquaculture
	Habitat features study
	Set up a protected area in Kinmen
	To formulate an initial conservation plan
The intermediate goal: habitat conservation	
	Promoting horseshoe crab conservation in Kinmen as a flag species representing coastal zones
	To develop an environmental monitor framework for horseshoe crab conservation in Kinmen
	To launch trials for the reintroduction of horseshoe crabs in Taiwan with the help from the local community
	To complete their life history survey
	Public education: conservation propaganda
	Ecotourism promotion
	To list them as conserved animals under the <i>Wildlife Conservation Law</i>
The ultimate goal: biodiversity conservation	
	To encourage a culture of naturalism and establish land ethics

3 The Processes of Developing Actions

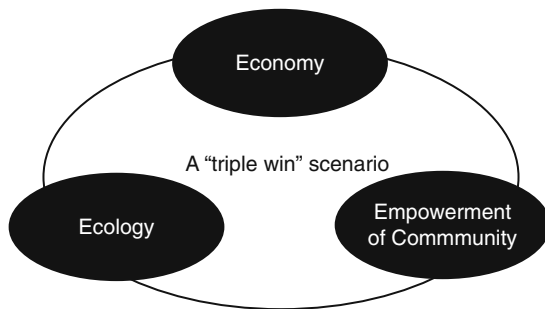
It is very challenging to translate research findings into more general community knowledge, and to influence management with regard to environmental conservation. In this sense, a breakthrough has to be made in the case of the conservation of horseshoe crabs by transforming the research project into an action plan with basically three steps: research, education, and coordination.

3.1 *Formulating the Workshop Processes*

People perceive nature in different ways. Some see its economic potential to develop, some see the abundant resources to exploit, some see its wonder to discover, some see its underlying dangers to fight against, and some just see the great beauty it possesses in its own right. All of these are valid. The problems and contentions come only when people from different backgrounds see different possibilities for the same area and begin to put their ideas in practice. Which ideology should take priority? The answer is neither quick nor simple. The problem has to be considered and assessed from multiple perspectives.

When it comes to conservation, scientists and researchers are basically left with a scientific-cultural-socio-economic-political complex. However, they are not environmentalists, tourism promoters, social reformers, or politicians. Apart from offering information and knowledge on a scientific basis, they cannot transform their roles into any of the other kinds. So, how can we make the conservation programs work? In the Kinmen case, the idea of an “environmental

Fig. 3 To reach sustainability Kinmen relies on the 3E dimensions. With the 3E the environmental monitoring framework creates a triple win stage to work upon



monitoring framework” was proposed aiming to incorporate the “3 E” dimensions, which are ecology, economic growth, and empowerment of the community, into one system. On the basis of these three aspects, it is more feasible and meaningful to talk about sustainable development (Fig. 3). In order to make the practices follow the above six principles, the notion of a “workshop” protocol was adopted into this working model (Fig. 4). The characteristics of this model are that you start from yourself, and reach out to those close to you, just like a ripple extending farther and farther.

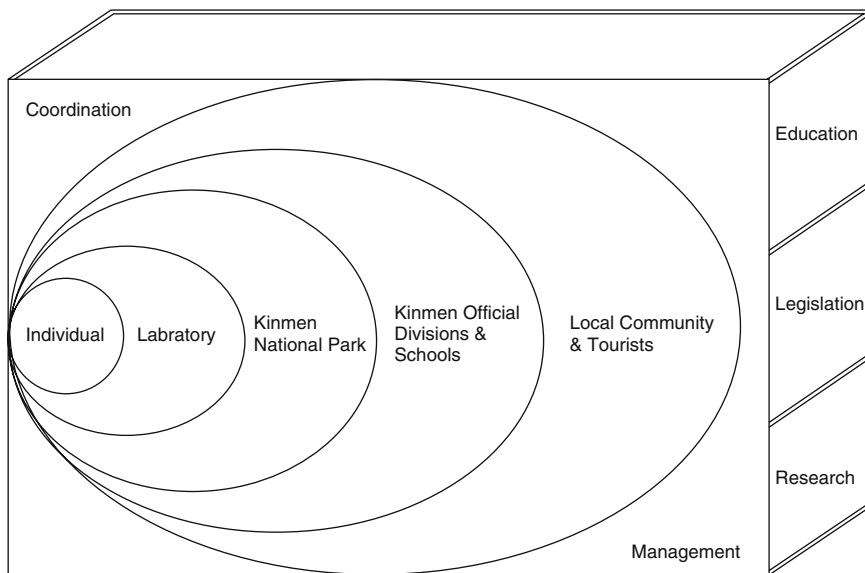


Fig. 4 The workshop working model. In the case of horseshoe crab conservation, the workshop contains people from research units, official units, schools, the local community, and tourists. Through various conferences, workshops, and meetings, ideas, opinions, and information can be collected and integrated. All of these efforts have to be built on the basis of education, legislation, and research

It is commonly recognized that societies cannot avoid certain levels of construction if they want to progress. There will always be construction, and some degree of impact is inevitable. The question is what level of impact the environment can tolerate and what restrictions we are willing to accept. In order to answer these, both scientific research and societal participation are required. That is why the workshop working model is so important here. The workshop model provides “interfaces” or platforms for different sectors, organizations, and special interests groups, to identify questions, to decide priorities, and to work out solutions under the same purpose of a “sustainable Kinmen.”

By means of the workshop platform, each organization could provide an essential contribution to the services, expertise and energy needed to advance the overall effort of conservation as well as disseminating and ingraining an awareness of information on and practice of conservation in the public consciousness.

The workshop model of horseshoe crab conservation includes people from research units, official units, conservation units, schools, local communities, and even tourists. Through various kinds of workshops, knowledge, experiences, ideas, opinions, and information can be collected, shared, and integrated. The workshop has reciprocal benefits. While it facilitates the process of cross-sector communication, community empowerment, and the interaction with various sectors, it contributes to formulating and improving the framework of the conservation program itself.

3.2 Conservation as an Action Plan

Usually, as much as a decade may pass before research findings become part of practical conservation programs and common knowledge. Therefore, solving the problem of how to “synchronize” scientific research in academia with management practices and general public knowledge is an important task for scientists, particularly those in conservation science. Success requires recognition and support from various sectors in society. Working as a team in this manner, scientific findings, in one aspect, could be adopted, delivered, and shared within and among different sectors, and in another aspect, could be integrated into the existing management system as well as become common knowledge.

4 Creation of Key Rings in the Conservation Network

Basically, the whole horseshoe crab conservation project could be described as a process of searching for missing links, not only in scientific understanding but also in many other social perspectives. So far several rings have been formed.

4.1 Protected Areas

In 1995, Kinmen County wanted to build a harbor at Shuitou Bay, which is the best place for horseshoe crabs due to the fact that the three required habitats occur nearby. The project for protecting the horseshoe crabs gained public attention due to the proposed changes to this bay. This bay is the only place suitable for building the harbor; however, juveniles occur along the west coast of Kinmen, so a tradeoff was made to create a protected area. With our scientific and local government's support, 800 ha of coastal zone were designated as "The Horseshoe Crab Protected Area" at Gunnintou in Kinmen in December 1999 (Chen et al. 2004). Many conservation efforts took off then, although the function of this protected area needs further improving. Several research projects are now ongoing.

4.2 Population Genetic Analyses

Another line of horseshoe crab study is based on population genetic analyses. With the tools of molecular biology, it is possible to identify a given population's status and connectivity among local populations. The genetic features of local populations also provide information which can be used for implementing different conservation strategies. For example, population subdivisions of the horseshoe crab in the Taiwan Strait were studied (Yang et al. 2007, 2009). The initial results of the genetic study highlight the importance of population genetic analyses toward conservation efforts in Taiwan as well as Southeast Asia and Japan. The higher genetic diversity and larger census population size found in Kinmen provide a reservoir of horseshoe crab genetic variation. Translocation of horseshoe crabs from nearby populations might be initiated to increase the genetic variability and to help prevent extinction of the local population.

4.3 Micro-Habitat Study of Nursing Grounds

What is the role of mud flats in the conservation of horseshoe crabs? The occurrence of juveniles in this habitat is a good indicator of the health of the mud flat, and its population size is also a good indicator of the status of the horseshoe crabs (for detailed results, see Hsieh and Chen 2009). Based on this study we look for potential nursing grounds for the juvenile horseshoes crabs in Taiwan.

4.4 Inducing Spawning of Horseshoe Crabs at Beaches in Taiwan

Horseshoe crab adults are easy to pair and spawn in a large aquarium. However, rearing larvae to the size suitable for releasing into the field is another story. So we

tried to develop induced spawning on the beach. In 2001, spawning was successfully induced at a beach in Kinmen (Chen et al., 2004). Eggs were deposited, but whether or not they developed into juveniles is unknown. Since then, we began studies to restore the population in Taiwan. We went through the literature to find the best place to do the restoration. We found that the coastal area of Tung-Hsiao once had a large population of horseshoe crabs. Assisted by the staff of local “Tung-Hsiao Beach Resort (West-Ocean Educational Sea World),” we started the restoration in the resort in 2002. The spawning experimental area enclosed both original substrate mud and restored coarse zone with fences. In accord with the tidal amplitude at the site, adult crabs were released for spontaneous mating and spawning. The experiment was very successful. Several pairs of horseshoe crab spawned in the experimental area. We found at least 10 nests. Every nest houses hundreds of eggs. About 50 days later, we found several newly hatched first instars. The details of this study are described in this book (Hsieh and Chen 2009).

We spent time cooperating with a local company and they created an exhibit so that students have the chance to see what horseshoe crab looks like and learn something about them. The owner has good connections with the TV stations, so there was lot of publicity and we were able to make the community aware of the horseshoe crab’s situation. The resort invited the national media to report the story. Even Taiwan’s vice president came to the resort. Horseshoe crabs became the subject of a special series of TV programs and the general public got to know about these living fossils.

In the end we gave up Tung-Hsiao for three reasons: it did not have a strong community base, there was a shortage of man power, and the natural tide energy is too low so the hatched trilobite larvae cannot be washed out to the mud flats by the natural tide. Our efforts are now concentrated on Chiayi (see Section 4.7).

4.5 Public Awareness

Many kinds of public education programs have been carried out. Symposia are academic meetings, but for the local community, the topic and the language must be appropriate to the audience. The workshop is really useful. Humans have hands as well as eyes and the hands need to be satisfied. During and after the workshop, participants have many learning opportunities to work by their hands. This not only makes them happy but also solves many problems.

Publication, the science book, and the television coverage are all parts of the public education programs. We published a Chinese book with cartoons so that it is easier for the young people to read. There has also been considerable media interest in horseshoe crab conservation. From October 1999 onwards, more than six TV stations have voluntarily contacted the team and with their help

produced programs introducing horseshoe crabs and highlighting the importance of its conservation to the public.

In 2007, two elementary school teachers from Taichong located near the middle of Taiwan compiled information on horseshoe crabs onto a CD which is now used as a teaching tool. This CD has already been passed on to other elementary schools helping to spread the message. The most intriguing part of this story is that neither of the two teachers attended any of our workshops but one of their mothers had participated frequently in Chiayi. Under her mother's suggestion and encouragement, the young teacher made this CD. This seed was planted and germinated in a place without our direct input or knowledge.

4.6 Tourism Industry in Kinmen

Ecotourism seems to bring a promising future to Kinmen, where there is a potential to develop this industry because of several unique features in its history, geography, culture, and natural environment. Kinmen hosts many endemic species, such as horseshoe crabs, amphioxus, and otters, and is also a stop for migratory birds. In addition, Kinmen had been famous for its Min-Nan style historical architectures, military sites, and agricultural products such as peanut tribute candy, Kao Liang liquor and even common products like the kitchen knife.

The problem of the impacts of tourism on the natural environment is sizable but not really new. In anticipation of the problems brought by tourism, the process of promoting and developing ecotourism management systems has been conducted in Kinmen since 2000. At the end of 2001, the team had already published a report, "A Strategic Plan for Ecotourism Management in Kinmen," urging the Kinmen government to develop a robust, science-based ecotourism management program. The report illustrated Kinmen's natural scenery, historical objects, and wildlife, and offered the framework to conduct and promote ecotourism in Kinmen.

The Kinmen government has already designed many souvenirs based on the shape of horseshoe crab, which means they already consider it one of the icons of Kinmen. Other measures are still awaiting implementation.

Furthermore, with the purpose of enhancing the ecotourism business, we published the English and the Japanese book in Taiwan, yet it did not work as well as hoped. In 2006, one airline company, UNI Air, provided a special tour offer with the emphasis of guiding tourists to see the horseshoe crab, a living fossil. This means their promotion efforts at least made some impact.

4.7 Community-Based Conservation Actions in Chiayi

In 2005, one local ecotourism operator discovered a small, natural juvenile population in the wetlands of Chiayi County. The owner made a small fence

around the juvenile horseshoe crabs for tourists to see them more easily. Although that specific population has occurred only once so far, that is enough to give us hope that natural populations can still be recovered. With our help, the NGO, Chiayi Ecological Environment Conservation Association, had formed the Horseshoe Crab Restoration Group of Chiayi, and a workshop for training the basic techniques of juvenile horseshoe crab monitoring and surveying was held in 2006. This group is under the Ecological Conservation Association of Chiayi. Apparently, the efforts of the team have been highly appreciated there and have contributed to the process of empowerment of the local community. “This restoration program makes me feel I’ve gained so much in the process,” Yin Tian Su, the chair of the Association, said while interviewed on PTV. He went on to say, “There are three aspects I’d like to mention. Firstly, I am so moved and excited that I could join a restoration project of a living fossil. Secondly, I’ve gained an adequate knowledge of horseshoe crab ecology and learned restoration techniques. Thirdly, this program has attracted many local people to take part in the environmental protection. The ecological environment has become one of the main concerns of our community.”

During 2006–2007, the team members bought about 10 adult crabs, which is one-third of landed on the local fish market. This summer (2007), we will help the members to induce adult horseshoe crabs to spawn along Budai coastal zone. We have built a spawning ground close to that area and we had a workshop gathering, measuring the slope using the camera as a horizontal measurement. The principal of an elementary school gathered students to clean out the sand beach. They have really done wonderful field work. This area in Chiayi County became the horseshoe crab restoration area. The government made a big advertising sign with the message “鸞起之秀,” (Fig. 5), which can have one of several meanings such as an up-and-coming youngster, a budding young talent, a promising young person, or a boy becoming a man. You just need to have the chance to see the small ones become the big ones. Here we see the Kinmen experience now has been duplicated in Chiayi in a much more efficient and effective way.

4.8 Cooperation with Scientists and Administrators Locally and Internationally

In 2000, 2001, and 2005, Japanese scholars and horseshoe crab conservationists led by Dr. Tomio Itow and Keiji Tsuchiya (Chairman, Japanese Horseshoe Crab Preservation Society) came to Kinmen to observe the status of horseshoe crab juveniles and share their experiences in conservation and aquaculture.

Due to the increasing construction in the coastal area in Xiamen, China, sand procurement has increased. Dredge boats that collect sand in the strait between Kinmen and Xiamen have become a common sight. Their activities could be contributing to the erosion of beach which in turn damages the



Fig. 5 A billboard put up in Chiayi County meant to increase awareness in the community of the dire situation the horseshoe crab faces if it is not protected and its habitat not preserved. The sign reads, “蟹起之秀,” which can be translated to be an up-and-coming youngster, a budding young talent, a promising young person, or a boy becoming a man, which encourages the reader to see the potential in the young horseshoe crabs

intertidal area of Gunnintou inhabited by the horseshoe crab juveniles. The other problem is that although the Kinmen Coast Guard can expel the boats from mainland China, the area of their jurisdiction is only within 2 miles of the shore. Outside this area they have no authority. Also, the establishment of invasive species from Xiamen is also a concern. Recently, smooth cordgrass (*Spartina alterniflora*) invaded into Kinmen from Xiamen. All of these issues highlight the urgent needs to cooperate with Xiamen. In 2006, an informal forum on horseshoe crab conservation was held in Xiamen, signaling the start of communication and cooperation across the strait; moreover, attending the ISSCHC 2007 is a great asset to the members of the conservation network in Taiwan.

5 Further Works

- After this meeting, our take-home actions are these: petition the government to list *T. tridentatus* as an endangered species. In the difficult task of conserving horseshoe crabs in Taiwan we need more efforts such as legislative protection on the species using the *Wildlife Conservation Law*.

- Cooperation with scientists and administrators across the Taiwan Strait, tri-region (Taiwan, China, and Hong Kong), and the Indo-Pacific region.
- Create the Blue-Palm Award (this name is takeoff of the green-thumb for people who are skilled at gardening) for the people who rear the horseshoe crabs from juveniles to sub-adults. This has three purposes: to learn about the aquatic ecosystem, and through this action gain passion and patience, and to gather important scientific data.
- Utilize the talents of young artists as horseshoe crabs are highly stimulating creatures for our imagination, especially for children who are so pure and naïve that their creations such as poems, stories, and drawings are heartfelt. We will encourage Taiwan students to attend the contest offered by the Ecological Research & Development Group (ERDG) or we may even create a Taiwan contest of our own. The work can be viewed online under the “Poems, Tales & Images” category of ERDG’s website at (www.horseshoecrab.org).

By creating a network of volunteers, the program has empowered people at the grass-roots level. These active individuals and/or groups are a great benefit to the conservation program because they help coordinate outreach programs, education, and training in their respective areas. However, it is hard to sustain this network with merely a volunteer force. Legislation and political power relating to the practices of conservation and public education related programs are required.

6 Conclusions

The conservation network of horseshoe crabs in Taiwan is workable but not easy to maintain. Before the ISSCHC 2007, we said that “Do nothing, and you gain absolutely nothing; Do it, and you have no guarantee of gaining it. Do it often and you may gain some of it, so you must do it.” Now, we say “We are on the right track, so just do it, and don’t worry too much.”

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