**CEPF SMALL GRANT FINAL PROJECT COMPLETION REPORT**

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|---|---|
| **Organization Legal Name:** | Bird Conservation Society of Thailand (BCST) |
| **Project Title:** | Developing a Conservation Data Management Tool for the Inner Gulf of Thailand |
| **Date of Report:** | February 7, 2013 |
| **Report Author and Contact Information** | Wicha Narungsri, wicha_na@yahoo.com, bcst@bcst.or.th<br>Philip D Round, pdround@ksc.th.com |

**CEPF Region: IndoChina**

**Strategic Direction:** 3.Engage key actors in reconciling biodiversity conservation and development objectives

**Grant Amount: US$20,000**

**Project Dates: 1 September 2011 to 30 November 2012**

**Implementation Partners for this Project (please explain the level of involvement for each partner):**

1) RSPB- help design and oversee the data management and field work components, facilitate the development of the conservation status report and advise on an advocacy strategy to promote the project outcomes.
2) Mahidol University, Thailand, through Asst. Prof. Philip D Round has an unparalleled knowledge of the birds of the Inner Gulf region having been involved in monitoring and reviewing shorebirds in the area for a number of years. Mahidol University will facilitate and supervise data collection and analysis.

## Conservation Impacts

***Please explain/describe how your project has contributed to the implementation of the CEPF ecosystem profile.***

The waterbirds of the East Asian-Australasian Flyway are among the least known and poorly protected in the world. This flyway encompasses the most densely populated part of the world where extreme pressures exist on both protected and unprotected wetlands. The greatest concentration of globally threatened waterbirds occurs here, and so effective protection of major wetlands is critical. hosts internationally important populations of 50 million migratory waterbirds – including shorebirds, Anatidae (ducks, geese and swans) and cranes, making it one of the most important sites within the East Asian-Australasian Flyway.

The Inner Gulf of Thailand stretches for approximately 195 km, passing through seven provinces, and is approximately 1,500 sq.km. in area. It comprises intertidal mudflats, mangroves, and vast systems of managed salt, shrimp and fish farms with stretches of sand beaches at the southern end of both east and west side. The area has high economic importance not only as a shipping route but also for industries ranging from small local aquatic enterprises to large industrial facilities, with significant on-going industrial growth anticipated.

The whole area is facing an increasing range of threats from coastal erosion, hydrological changes, degradation and over-exploitation of intertidal mudflats, hunting, pollution from industry and urban

waste. However, the single most important threat is uncontrolled land reclamation for urban and industrial development. A paucity of systematically collected and managed data, and accessible information, on habitat extent and quality and bird use on this vast and complex system, particularly by globally threatened species, impedes efforts to achieve sustainable development whilst protecting its unique biodiversity. This lack of basic evidence hampers consideration of the importance of the Gulf's bird populations in national and regional planning and enables incremental losses. There is virtually no onshore habitat protection, no zoning to prevent piecemeal loss from land speculation, and little control over creeping urbanisation and industrialisation associated with the spread of Bangkok and the provincial capitals. A healthy, functioning Inner Gulf wetland system will be better able to maintain its interest and adjust in the face of sea level rise.

***Please summarize the overall results/impact of your project against the expected results detailed in the approved proposal.***

Overall results of the project correspond to the expected results :

1.) The project has been coordinated with government agencies and local conservation groups involved in the project target areas. The relevant authorities are understand benefits of the project. This can be aware of their area as well. As with any type of land use, it can be made to protect the land and to determine the management plan for the conservation and development in the future.

2.) ArcGIS 10, provided to BCST as the Thai BirdLife partner, was installed. Satellite images and data (LANDSAT 5/TM) for 1990, 2000 and 2011, covering c.1500 sq km, were purchased and a classification of land cover along the Inner Gulf was undertaken by GISTDA (Geo-Informatics and Space Technology Development Agency, Ministry of Science and Technology, Thailand) and land used map that taken by LDD (Land Development Department, Ministry of Agriculture and Cooperatives). In addition, all of the image data processing will be carried out color and geometric correction. In order to obtain a clear and accurate positioning. All of image must be overlaid and interpreted together. We determined the accuracy of information by field survey and compare with other data sources. These data show the extent of 11 land covers in all three years (1. Agricultural, 2. Aquacultural, 3. Bare-soil, 4. Beach, 5. Deciduous forest, 6. Mangrove forest, 7. Saltpan, 8. Sea, 9. Mudflat, 10. Urban/city, 11. Water). Assessment of the extents is 1,563.72 sq.km is given in table 1. Landuse Map of Inner Gulf of Thailand in 1900, 2000 and 2011 are shown in Fig. 1, Fig.2 and Fig.3

3.) Records of five globally threatened/near-threatened species (Spotted Greenshank *Tringa guttifer*, Eurasian Curlew *Numenius arquata*, Asian Dowitcher *Limnodromus semipalmatus*, Chinese Egret *Egretta eulophotes*, and Spoon-billed Sandpiper *Eurynorhynchus pygmeus*) have been collated from available data and imported into the GIS. These constitute 540 records in total, dating back to 1984, but over 90% of which were collected post-2000. A Line chart showing number of maximum count of a couple of species per year (Fig.4) is provided. Additionally, 78,727 individual of 59 species collected at low tide along 14 mudflat transects spread throughout the gulfs. Additionally, a total of 20,600 bird records collated nationwide since 2000 are being filtered for input of selected species from the Inner Gulf study area. Fig.5, Fig.6 and Fig.7 showing a distribution map for Spotted Greenshank, Eurasian Curlew and Asian Dowitcher.

4.) The analysis showed a major loss (131 sq.km, a more than 50% decline) in agricultural land, and a more than doubling of the urbanized area- an increase of 126 sq.km. (Table 1). The extent of mud flats, a key habitat for waders, was limited to just 34.24 sq.km at the start of the study, and declined by over 50% over the 1990 – 2010 study period. Salt-pans, another key wetland habitat of conservation importance, declined by 20% (33 sq.km). Much of this decline was probably due to conversion to aquaculture ponds rather than urbanization. Nonetheless, the actual

conservation impact is possibly greater than the 20% reduction suggesting the piecemeal encroachment of urban areas into the salt pans, especially along roadsides, fragmenting the salt pans.

The area occupied by aquaculture ponds increased by 42.26 sq.km. during the 1990-2011 study period, but this increase occurred post 2000. Between 1990-2000 there was a decline in area of aquaculture. After a pre 1990 expansion of aquaculture, many aquaculture ponds were abandoned between 1990 - 2000 and reverted to salt pans, as poor husbandry practices resulted in a spread of fungal disease, pollution and loss of yield. The period from 2000 onwards again saw an increase in areas occupied by aquaculture, with ponds now being used for sea-shrimps combined with crabs and molluscs.

5.) BCST will maintain the GIS-based information system, and facilitate discussions with local communities, NGOs, media and Government agencies to scope the kinds and form of data they need. They will promote the initial state of play assessment and help lobby for appropriate protection of the key sites identified. As a result of this project is very useful. It can be applied to manage of the environment as an important area in the future. We will provide support for assessing the implications of planned and unplanned land-use change throughout the government agencies.

***Please provide the following information where relevant:***

**Hectares Protected: N/A**
**Species Conserved: N/A**
**Corridors Created: N/A**

***Describe the success or challenges of the project toward achieving its short-term and long-term impact objectives.***

Developing a Conservation Data Management tool for the Inner gulf of Thailand is a new challenge for BCST. It's not easy to achieve the objectives. The success of this project begin with a good relationship with government agencies in national and local level. We collaborate with local communities and local conservation groups for coastal conservation work in the Inner Gulf of Thailand for a period not less than six years. We believe that this project could benefit to the local governments and local conservation groups to be able to manage their own development of intelligent and sustainable in future.

***Were there any unexpected impacts (positive or negative)?***
No.

## Lessons Learned

***Describe any lessons learned during the design and implementation of the project, as well as any related to organizational development and capacity building. Consider lessons that would inform projects designed or implemented by your organization or others, as well as lessons that might be considered by the global conservation community.***

It was totally different from how the project was implemented in the past. BCST should take this opportunity to improve its capacity through people. There was a delay during the process due to the lack of GIS staff. Sooner or later, BCST needs to solve this problem so as to be able to develop Bird's database and keep the data in the form of GIS. BCST aims to be the centre of bird information and publish it on the website for the public and those who are interested in order to raise public awareness of the important of bird and habitat conservation, especially those bird species in red list by IUCN.

***Project Design Process: (aspects of the project design that contributed to its success/shortcomings)***

This project was designed base on the trend of the land use change in the Inner Gulf of Thailand. By BCST's work with local communities in the area. We noticed that the area was changed dramatically within the last 10 years, the decline of bare soil, at the same time, it was rapidly expanding urban areas. So this the main motivation for this project design.

***Project Implementation: (aspects of the project execution that contributed to its success/shortcomings)***

Despite the fact that we lack of GIS staffs, and there was a change of a person in charge during the process. But we can find another GIS person to do this project. With the clearly of concept and objective. He's working well with our conservation staff So the result from overlaying of many maps, field surveys and birds data can interpreted to local communities, local and center government for management plan in the Inner Gulf of Thailand in future.

***Other lessons learned relevant to conservation community:***

An extensive experience in the Inner Gulf of Thailand, we understand the diverse needs of the community regarding conservation. It took time and a lot of effort to educate the community and the local government which facing difficult challenge of sustainable development and environmental management. In particular, local governments in some areas haven't unclear plan to develop the area. Although the development is not threat to the area of important migratory birds. Therefore, an understanding of the environment and resources are necessary to be taken continuously. In order to determine the priority areas for conservation and environmental protection at the national level in the future.

## ADDITIONAL FUNDING

***Provide details of any additional donors who supported this project and any funding secured for the project as a result of the CEPF grant or success of the project.***

| Donor | Type of Funding* | Amount | Notes |
|---|---|---|---|
| RSPB | A | $1,500 | RSPB travel and subsistence cost |
| Mahidol University, Thailand | A | $2,000 | Supervision of data collection and analysis |
| Center for Learning and Actions on Natural Resources and Environment Conservation (East Mahachai) and Khok Kham Nature Conservation Club | A | $500 | Assistance during field surveys |
| | | | |

***Additional funding should be reported using the following categories:***

- ***A*** *Project co-financing (Other donors contribute to the direct costs of this CEPF project)*
- ***B*** *Grantee and Partner leveraging (Other donors contribute to your organization or a partner organization as a direct result of successes with this CEPF project.)*

***C*** *Regional/Portfolio leveraging (Other donors make large investments in a region because of CEPF investment or successes related to this project.)*

## Sustainability/Replicability

***Summarize the success or challenge in achieving planned sustainability or replicability of project components or results.***

***Summarize any unplanned sustainability or replicability achieved.***

## Safeguard Policy Assessment

***Provide a summary of the implementation of any required action toward the environmental and social safeguard policies within the project.***

## Performance Tracking Report Addendum

**CEPF Global Targets**

**(2011-2012)**

**Provide a numerical amount and brief description of the results achieved by your grant.**
**Please respond to only those questions that are relevant to your project.**

| Project Results | Is this question relevant? | If yes, provide your numerical response for results achieved during the annual period. | Provide your numerical response for project from inception of CEPF support to date. | Describe the principal results achieved from July 1, 2012 to June 30, 2013. (Attach annexes if necessary) |
|---|---|---|---|---|
| 1. Did your project strengthen management of a protected area guided by a sustainable management plan? Please indicate number of hectares improved. | No | | | Please also include name of the protected area(s). If more than one, please include the number of hectares strengthened for each one. |
| 2. How many hectares of new and/or expanded protected areas did your project help establish through a legal declaration or community agreement? | No | | | Please also include name of the protected area. If more than one, please include the number of hectares strengthened for each one. |
| 3. Did your project strengthen biodiversity conservation and/or natural resources management inside a key biodiversity area identified in the CEPF ecosystem profile? If so, please indicate how many hectares. | No | | | |
| 4. Did your project effectively introduce or strengthen biodiversity conservation in management practices outside protected areas? If so, please indicate how many hectares. | No | | | |
| 5. If your project promotes the sustainable use of natural resources, how many local communities accrued tangible socioeconomic benefits? Please complete Table 1below. | No | | | |

**If you answered yes to question 5, please complete the following table.**

**Table 1: Socioeconomic Benefits to Target Communities**

Please complete this table if your project provided concrete socioeconomic benefits to local communities. List the name of each community in column one. In the subsequent columns under Community Characteristics and Nature of Socioeconomic Benefit, place an X in all relevant boxes. In the bottom row, provide the totals of the Xs for each column

| Name of Community | Community Characteristics | | | | | | | | Nature of Socioeconomic Benefit | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Increased Income due | | | | | | | | | | | | |
| | Small Landowners | Subsistence economy | Indigenous / ethnic peoples | Pastoralists / nomadic peoples | Recent migrants | Urban communities | Communities falling below the poverty rate | Other | Adoption of sustainable natural resources management practices | Ecotourism revenues | Park management activities | Payment for environmental services | Increased food security due to the adoption of sustainable fishing, hunting, or agricultural practices | More secure access to water resources | Improved tenure in land or other natural resource due to titling, reduction of colonization, etc | Reduced risk of natural disasters (fires, landslides, flooding, etc) | More secure source of energy | Increased access to public services, such as education, health, or credit | Improved use of traditional knowledge for environmental management | More participatory decisionmaking due to strengthened civil society and governance | Other |
| | | | | | | | | | | | | | | | | | | | | | |
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| Total | | | | | | | | | | | | | | | | | | | | | |

If you marked "Other", please provide detail on the nature of the Community Characteristic and Socioeconomic Benefit:

## Additional Comments/Recommendations

## Information Sharing and CEPF Policy

CEPF is committed to transparent operations and to helping civil society groups share experiences, lessons learned, and results. Final project completion reports are made available on our Web site, www.cepf.net, and publicized in our newsletter and other communications.

**Please include your full contact details below:**

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**APPENDIX**

**Final Report on CEPF Small Grant Final Project**
**"Developing a Conservation Data Management Tool for the Inner Gulf of Thailand"**

**Table 1. Land cover changein Inner Gulf Study Area 1990-2011 (sq.km).**

| CLASSNAME | Area (km2) | | | 1990-2000 | | 2000-2011 | | 1990-2011 | |
|---|---|---|---|---|---|---|---|---|---|
| | 1990 | 2000 | 2011 | (km2) | (%) | (km2) | (%) | (km2) | (%) |
| Agricultural | 227.04 | 232.33 | 95.63 | 5.28 | 2.33 | -136.70 | -58.84 | -131.42 | -57.88 |
| Aquacultural | 492.46 | 480.73 | 534.72 | -11.73 | -2.38 | 53.99 | 11.23 | 42.26 | 8.58 |
| Bare-soil | 36.25 | 6.54 | 6.04 | -29.72 | -81.97 | -0.50 | -7.63 | -30.22 | -83.35 |
| Beach | 1.01 | 1.18 | 0.50 | 0.17 | 16.80 | -0.68 | -57.64 | -0.51 | -50.52 |
| Deciduous forest | 1.87 | 2.14 | 1.71 | 0.26 | 14.12 | -0.43 | -19.94 | -0.16 | -8.64 |
| Mangrove forest | 90.36 | 121.04 | 104.95 | 30.68 | 33.95 | -16.09 | -13.29 | 14.59 | 16.15 |
| Saltpan | 164.61 | 137.51 | 131.57 | -27.10 | -16.46 | -5.94 | -4.32 | -33.04 | -20.07 |
| Sea | 358.97 | 359.03 | 380.02 | 0.07 | 0.02 | 20.99 | 5.85 | 21.05 | 5.86 |
| Mudflat | 34.24 | 36.38 | 16.19 | 2.14 | 6.24 | -20.19 | -55.49 | -18.05 | -52.71 |
| Urban | 119.84 | 148.05 | 245.83 | 28.21 | 23.54 | 97.78 | 66.05 | 125.99 | 105.13 |
| Water | 37.06 | 38.80 | 46.57 | 1.74 | 4.70 | 7.77 | 20.03 | 9.51 | 25.67 |
| Total | 1,563.72 | 1,563.72 | 1,563.72 | | | | | | |

**Changes in Bare soil**
**Comparison of the changes between the years 1990 to 2011.**
In 1990, 36.25 sq.km. was classified as Bare soil but this area fell to only 6.04 sq.km. by 2011, ., equivalent to a 83.35% reduction (30.22 sq.km.). The following figures indicate the land use changes that occurred for Bare soil.

1.) Aquaculture area 2.29 sq.km. equivalent to 37.98 %
2.) Bare soil area 2.04 sq.km. equivalent to 33.83 %
3.) Agriculture area 1.14 sq.km. equivalent to 18.91 %
4.) Salt pan area 0.23 sq.km. equivalent to 3.81 %
5.) Urban area 0.18 sq.km. equivalent to 2.99 %
6.) Mangrove forest area 0.08 sq.km. equivalent to 1.33 %
7.) Water area 0.06 sq.km. equivalent to 1.00 %
8.) Beach area 0.01 sq.km. equivalent to 0.17 %
9.) Deciduous forest area 0.00 sq.km. equivalent to 0.00 %
10.) Sea area 0.00 sq.km. equivalent to 0.00 %
11.) Mud flat area 0.00 sq.km. equivalent to 0.00 %
**Total** **6.04 sq.km.**

**Changes in Urban**
**Comparison of the changes between the years 1990 to 2011.**
In 1990, the area of urban was 119.84 sq.km. this increased to 245.83 sq.km. by 2011 equivalent to a 105.13% increasing. The following figures indicate the land use changes that occurred for urban.

1.) Urban area 106.36 sq.km. equivalent to 43.26 %

| | | | |
|---|---|---|---|
| 2.) | Agriculture | area 74.79 sq.km. | equivalent to 30.42 % |
| 3.) | Aquaculture | area 40.11 sq.km. | equivalent to 16.32 % |
| 4.) | Mangrove forest | area 10.76 sq.km. | equivalent to 4.38 % |
| 5.) | Salt pan | area 7.04 sq.km. | equivalent to 2.86 % |
| 6.) | Water | area 2.80 sq.km. | equivalent to 1.14 % |
| 7.) | Bare soil | area 2.64 sq.km. | equivalent to 1.07 % |
| 8.) | Mud flat | area 0.51 sq.km. | equivalent to 0.21 % |
| 9.) | Sea | area 0.36 sq.km. | equivalent to 0.15 % |
| 10.) | Beach | area 0.24 sq.km. | equivalent to 0.10 % |
| 11.) | Deciduous forest | area 0.23 sq.km. | equivalent to 0.09 % |
| **Total** | | **245.84 sq.km.** | |

**Changes in Mudflat**

**Comparison of the changes between the years 1990 to 2011.**

In 1990, the area of mudflat was 34.24 sq.km. this decreased to 16.19 sq.km. by 2011 equivalent to a 52.71% reduction. The following figures indicate the land use changes that occurred for mudflat.

| | | | |
|---|---|---|---|
| 1.) | Mud flat | area 10.70 sq.km. | equivalent to 66.13 % |
| 2.) | Sea | area 3.06 sq.km. | equivalent to 18.91 % |
| 3.) | Aquaculture | area 0.89 sq.km. | equivalent to 5.50. % |
| 4.) | Salt pan | area 0.55 sq.km. | equivalent to 3.40 % |
| 5.) | Bare soil | area 0.48 sq.km. | equivalent to 2.97 % |
| 6.) | Mangrove forest | area 0.37 sq.km. | equivalent to 2.29 % |
| 7.) | Water | area 0.09 sq.km. | equivalent to 0.56 % |
| 8.) | Urban | area 0.02 sq.km. | equivalent to 0.12 % |
| 9.) | Beach | area 0.02 sq.km. | equivalent to 0.12 % |
| 10.) | Agriculture | area 0.00 sq.km. | equivalent to 0.00 % |
| 11.) | Deciduous forest | area 0.00 sq.km. | equivalent to 0.00 % |
| **Total** | | **16.18 sq.km.** | |

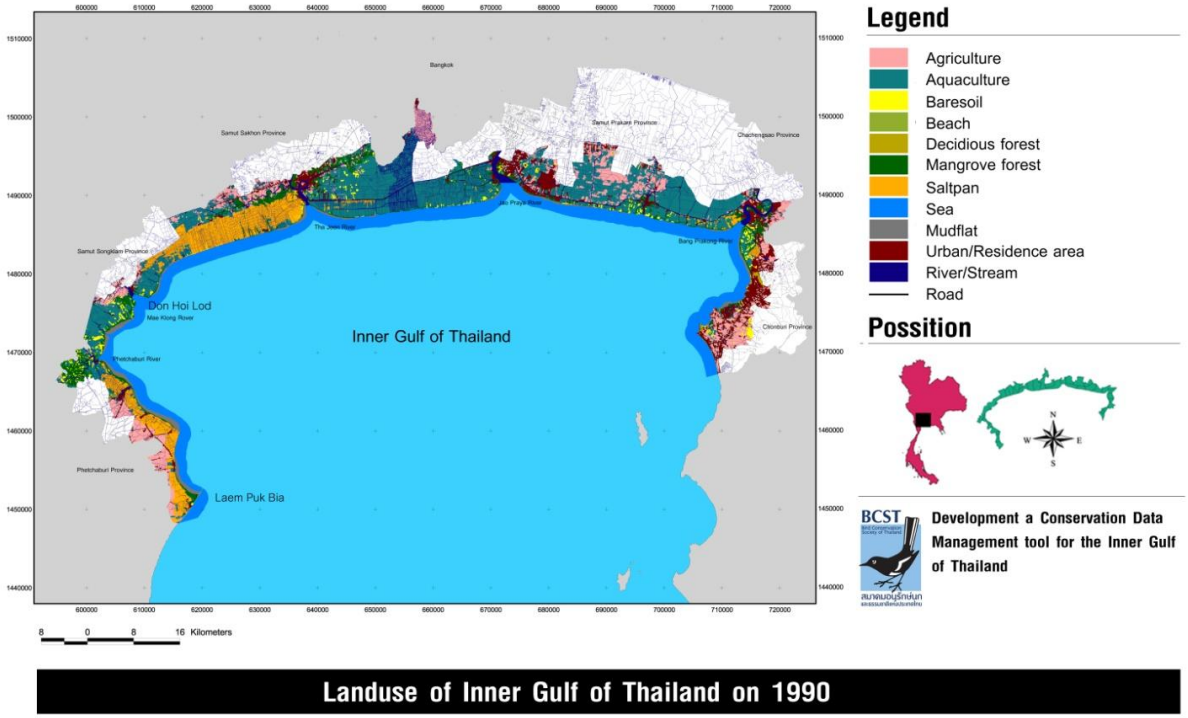
**Changes in Salt pan**

**Comparison of the changes between the years 1990 to 2011.**

In 1990, the area of Salt pan was 164.61 sq.km. this decreased to 131.57 sq.km. by 2011 equivalent to a 20.07% reduction. The following figures indicate the land use changes that occurred for salt pan.

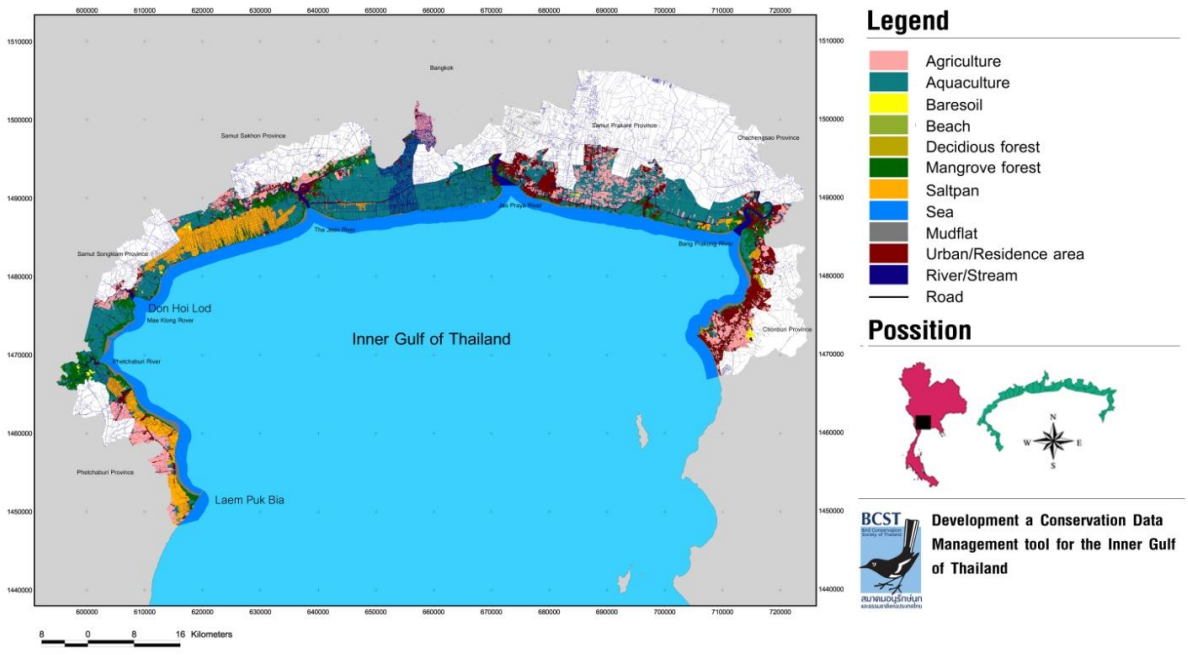
| | | | |
|---|---|---|---|
| 1.) | Salt pan | area 112.02 sq.km. | equivalent to 85.14 % |
| 2.) | Aquaculture | area 9.65 sq.km. | equivalent to 7.33 % |
| 3.) | Mangrove forest | area 7.67 sq.km. | equivalent to 5.83 % |
| 4.) | Agriculture | area 1.41 sq.km. | equivalent to 1.07 % |
| 5.) | Urban | area 0.59 sq.km. | equivalent to 0.45 % |
| 6.) | Mud flat | area 0.10 sq.km. | equivalent to 0.08 % |
| 7.) | Bare soil | area 0.07 sq.km. | equivalent to 0.05 % |
| 8.) | Sea | area 0.03 sq.km. | equivalent to 0.02 % |
| 9.) | Water | area 0.02 sq.km. | equivalent to 0.02 % |
| 10.) | Beach | area 0.01 sq.km. | equivalent to 0.01 % |
| 11.) | Deciduous forest | area 0.00 sq.km. | equivalent to 0.00 % |
| **Total** | | **131.57 sq.km.** | |

**Fig. 1 Landuse Map of Inner gulf of Thailand on 1990**




**Landuse of Inner Gulf of Thailand on 1990**

**Fig. 2 Landuse Map of Inner gulf of Thailand on 2000**




**Landuse of Inner Gulf of Thailand on 2000**

**Fig. 3 Landuse Map of Inner gulf of Thailand on 2011**

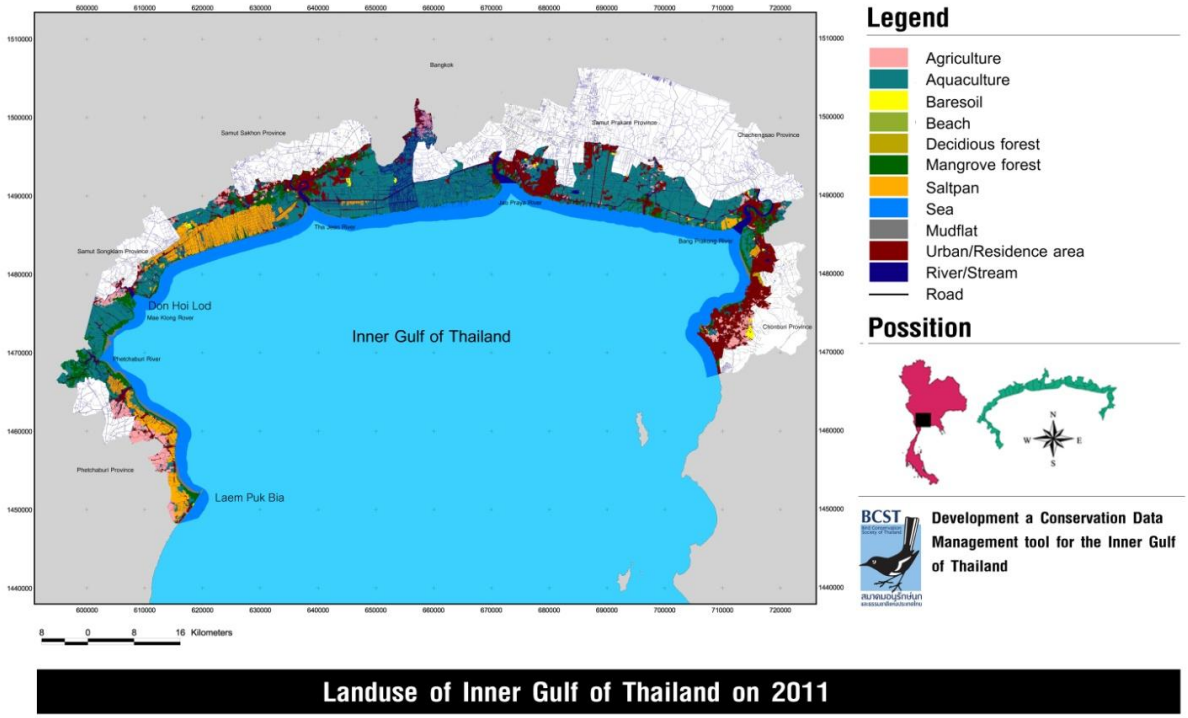



**Fig. 4 A Line chart showing number of maximum count of Spotted Greenshank, Eurasian Curlew and Asian Dowitcher**

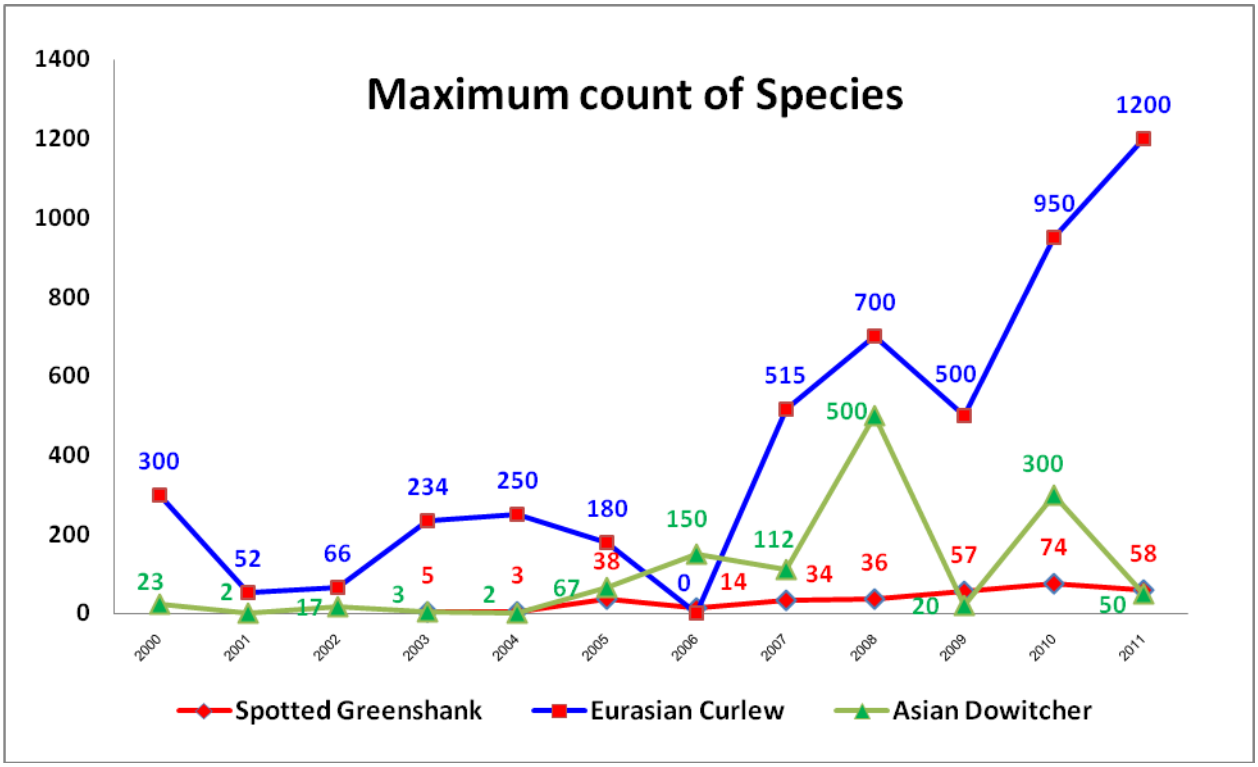
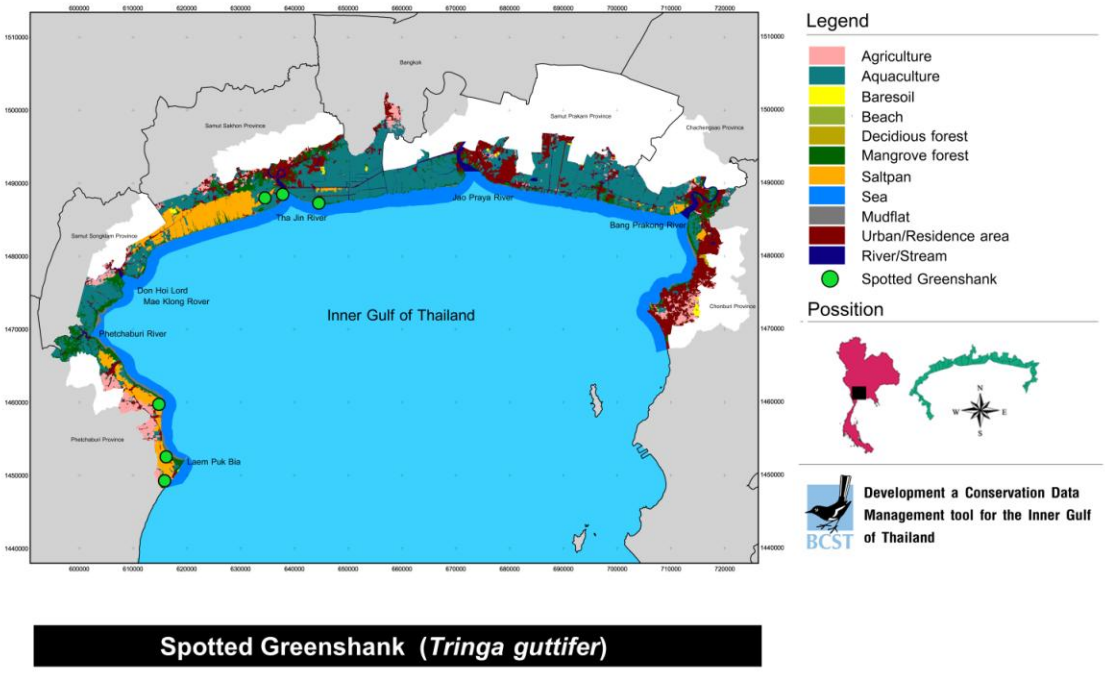
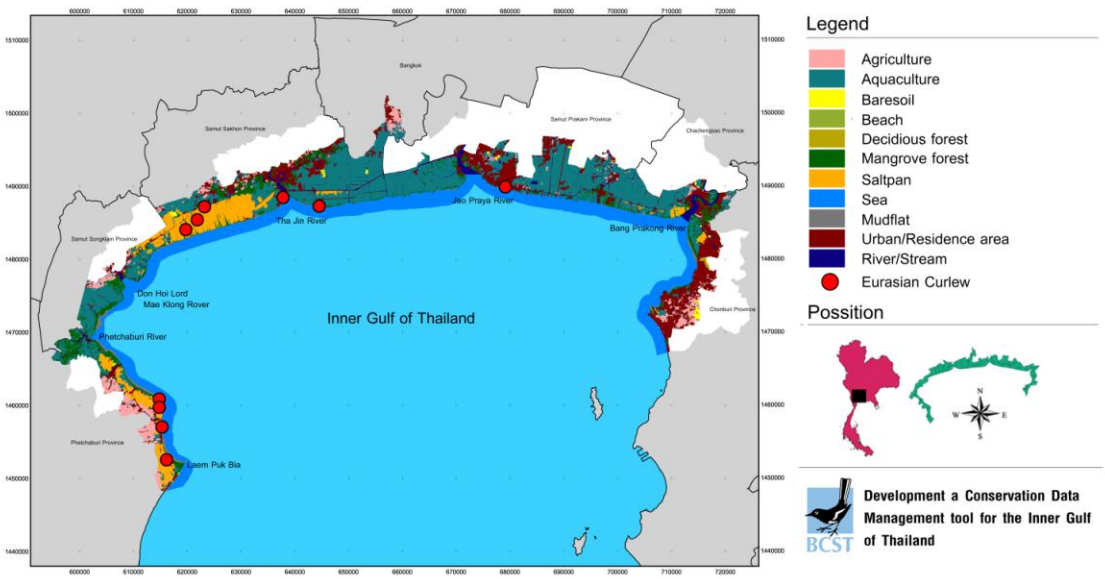


**Fig. 5 A distribution map for Spotted Greenshank**



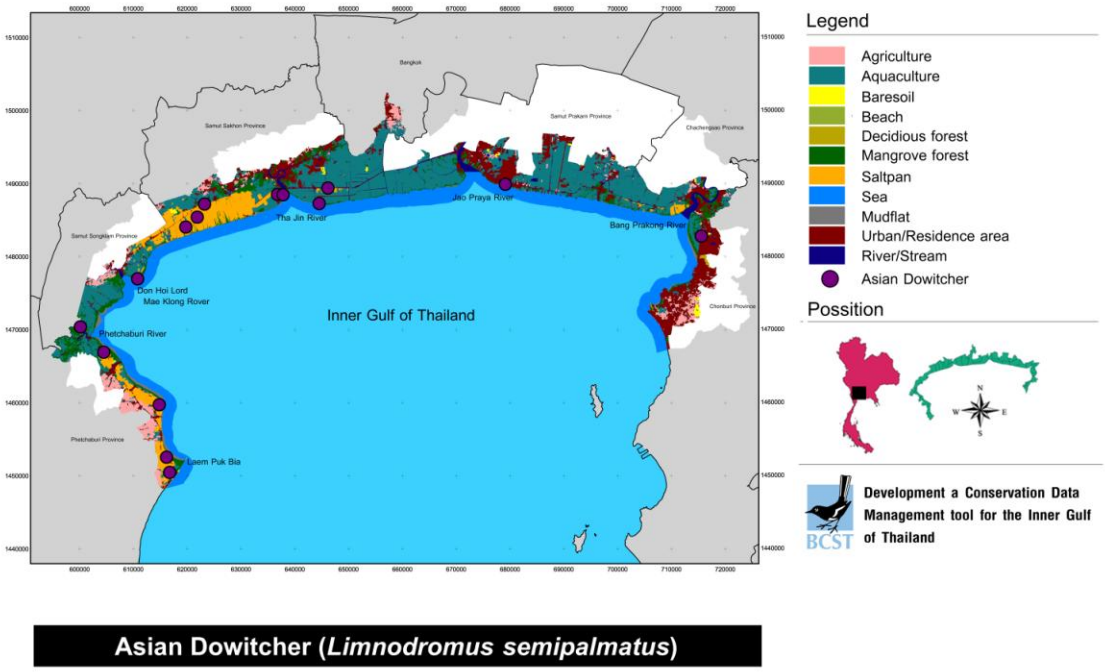

**Spotted Greenshank (*Tringa guttifer*)**

**Fig. 6 A distribution map for Eurasian Curlew**




**Eurasian Curlew (*Numenius arquata*)**

**Fig. 7 A distribution map for Asian Dowitcher**




**Asian Dowitcher (*Limnodromus semipalmatus*)**