

Key issues and conservation strategies of biodiversity in China

-Taking wetlands in the Lower Yangtze River as the case study

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My research

1. Status alteration of wetland resources in the Lower Yangtze River estuary
 2. Development of invasive species -- *Spartina alterniflora* invasion
 3. Effects on biodiversity conservation.
 4. Possible conservation strategies
- 



Methods

- Remote sensing images interpretation of wetlands in the Lower and Central Yangtze River in 1990, 2000 and 2008,
- Image processing, matching and projection transferring,
- Altitude data with 1km spatial resolution,
land use/coverage data in 2000(1:100,000),
Google Earth map data,
And national wetland investigation data as auxiliary data
for checking and analysis.

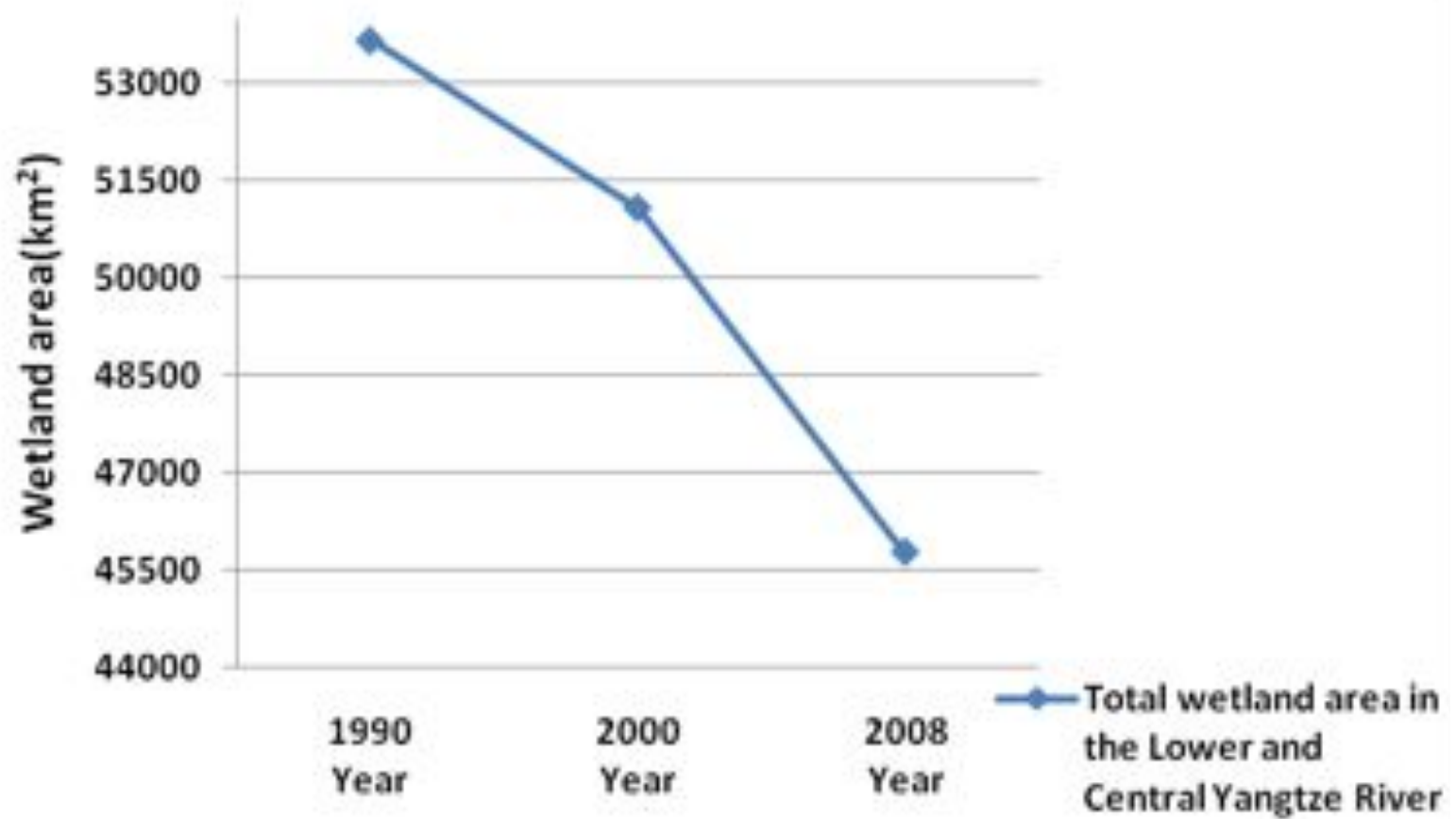
Results

- The wetlands in the Lower and Central Yangtze face a dangerous trend of ceaseless degradation.

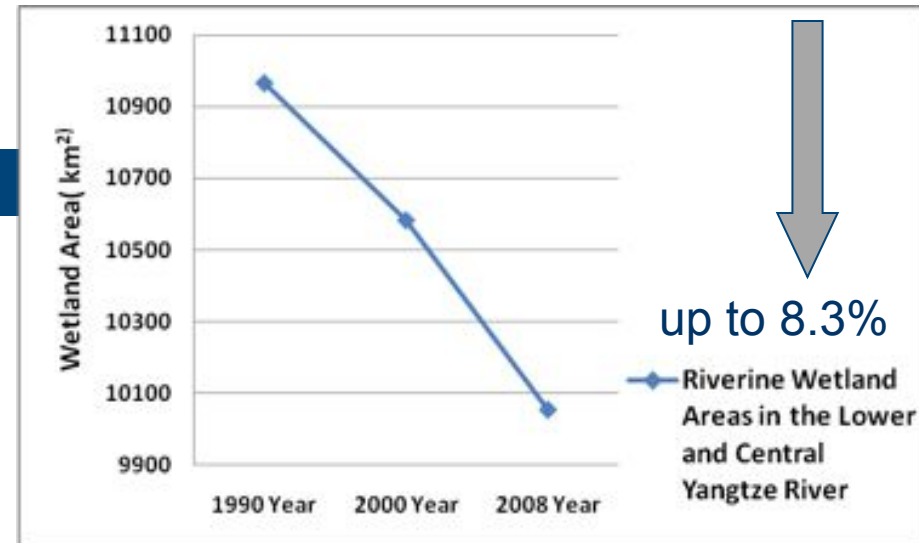
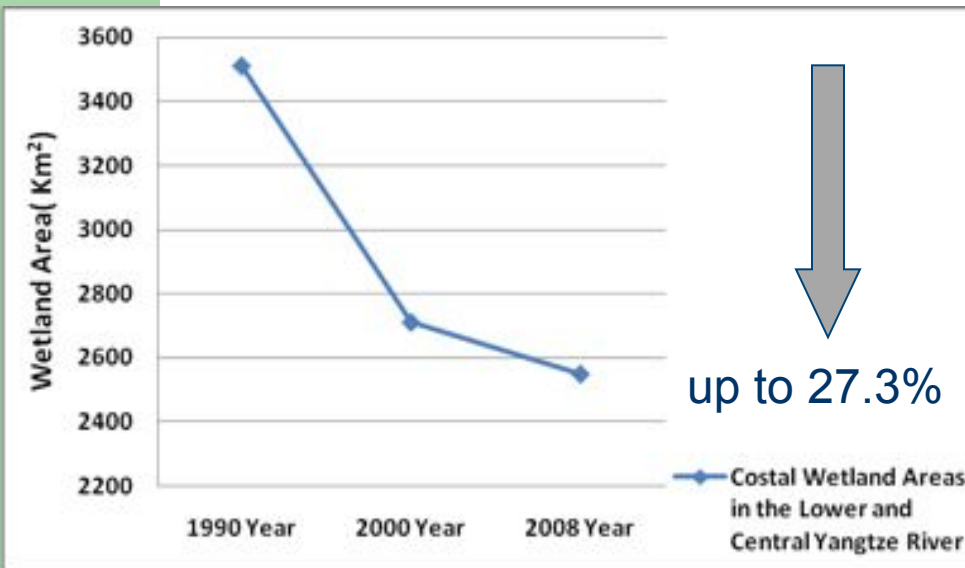
Performance

- The total wetland area in the Lower and Central Yangtze in the past 20 years has dropped from 53,661km² in 1990 to 45,778km² in 2008

Showing a decline of up to 17.2%

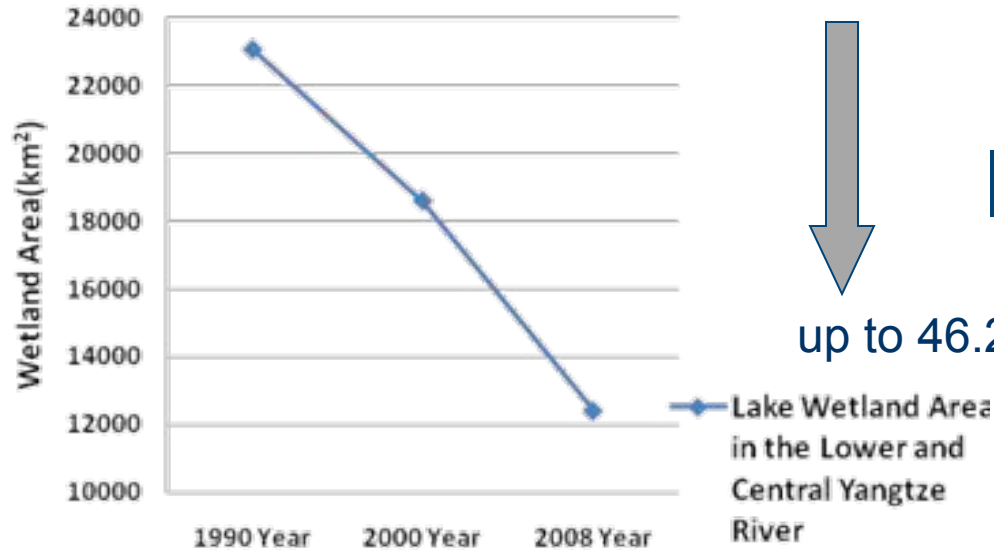


- Riverine wetland area change in the Lower and Central Yangtze in 1990-2008



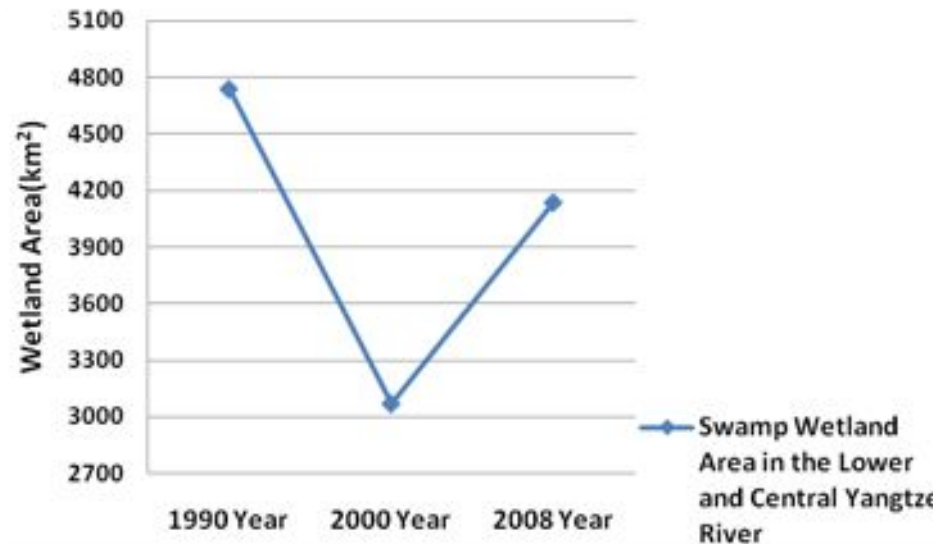
- Coastal wetland area change in the Lower and Central Yangtze in 1990-2008

Lake wetland area change in the Lower and Central Yangtze in 1990-2008.



up to 13.9%

Swamp wetland area change



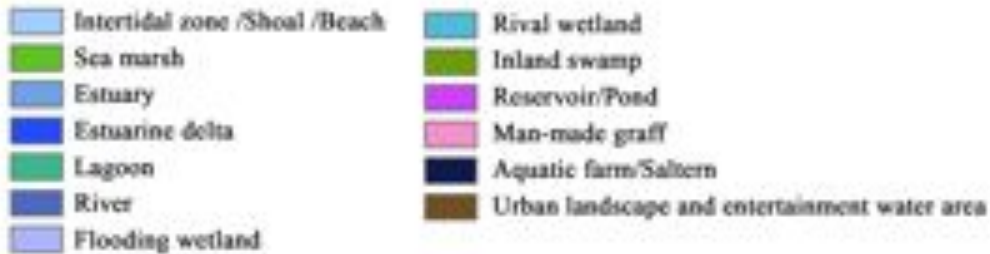
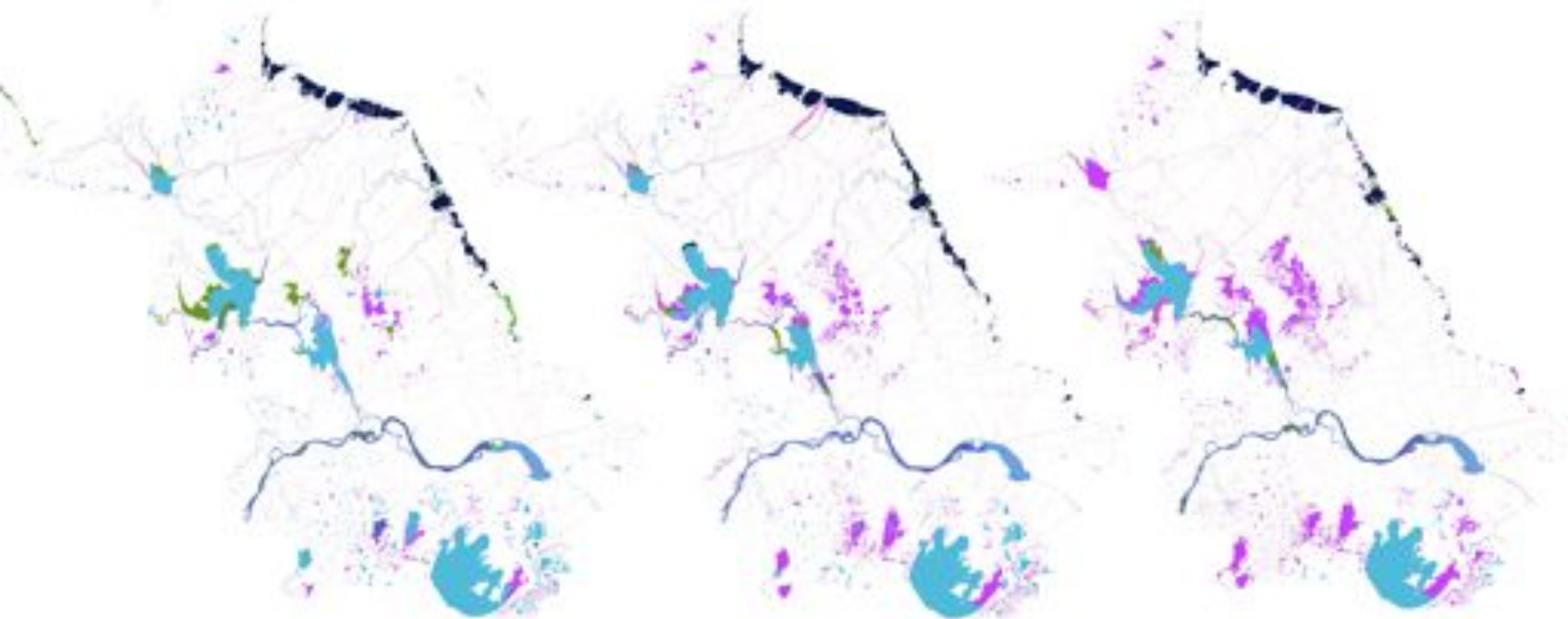
- total wetland area 17.2%
- lake wetland 46.2%
- coastal wetland 27.3%
- swamp wetland 13.9%
- riverine wetland 8.3%

Wetland resources status in the Lower Yangtze in 1990-2008

1990 Year

2000 Year

2008 Year

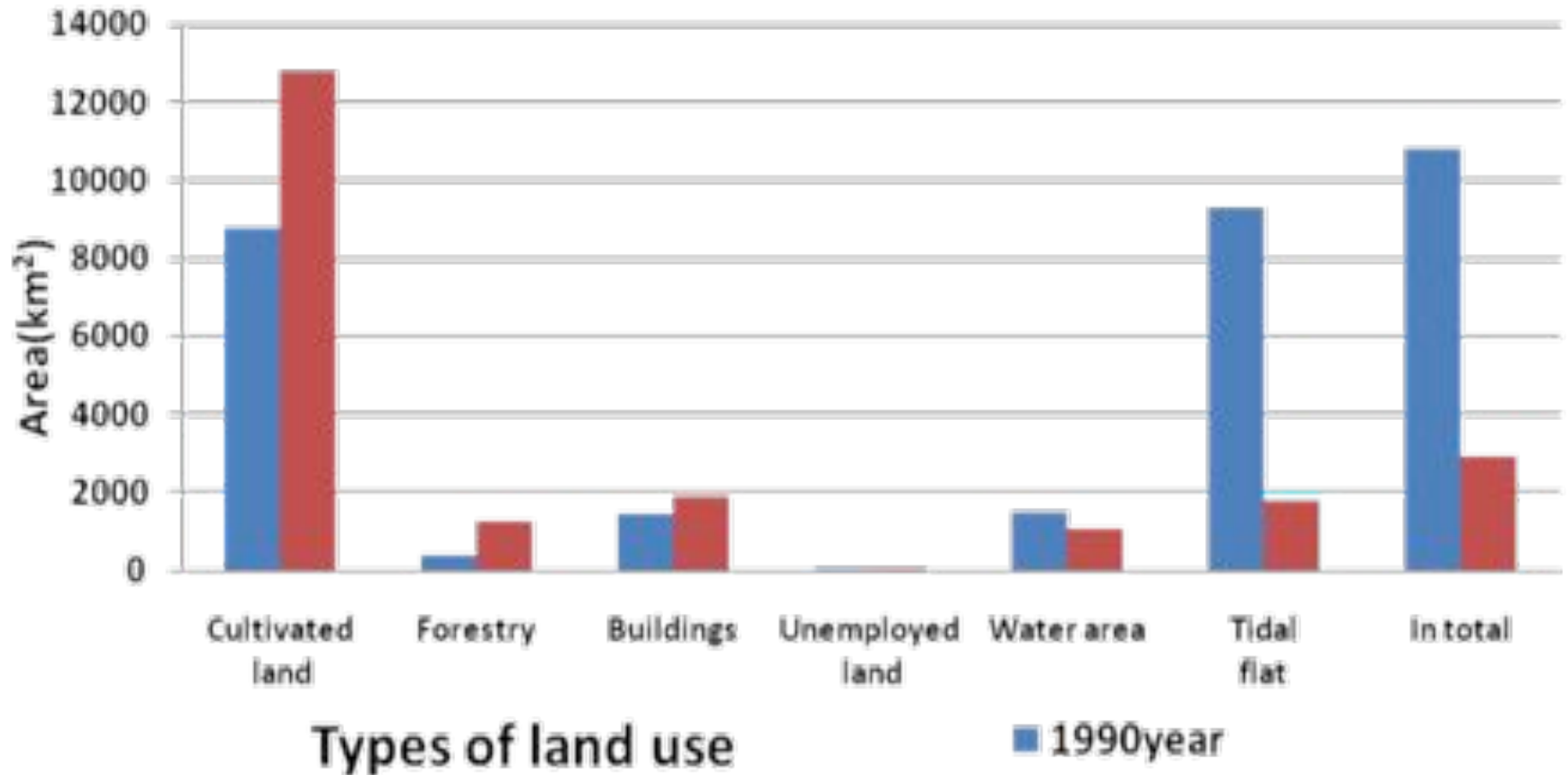


Kilometers

0 37.5 75 150 225



Land use change in east of Chongming Dongtan Island in the past 20 years.



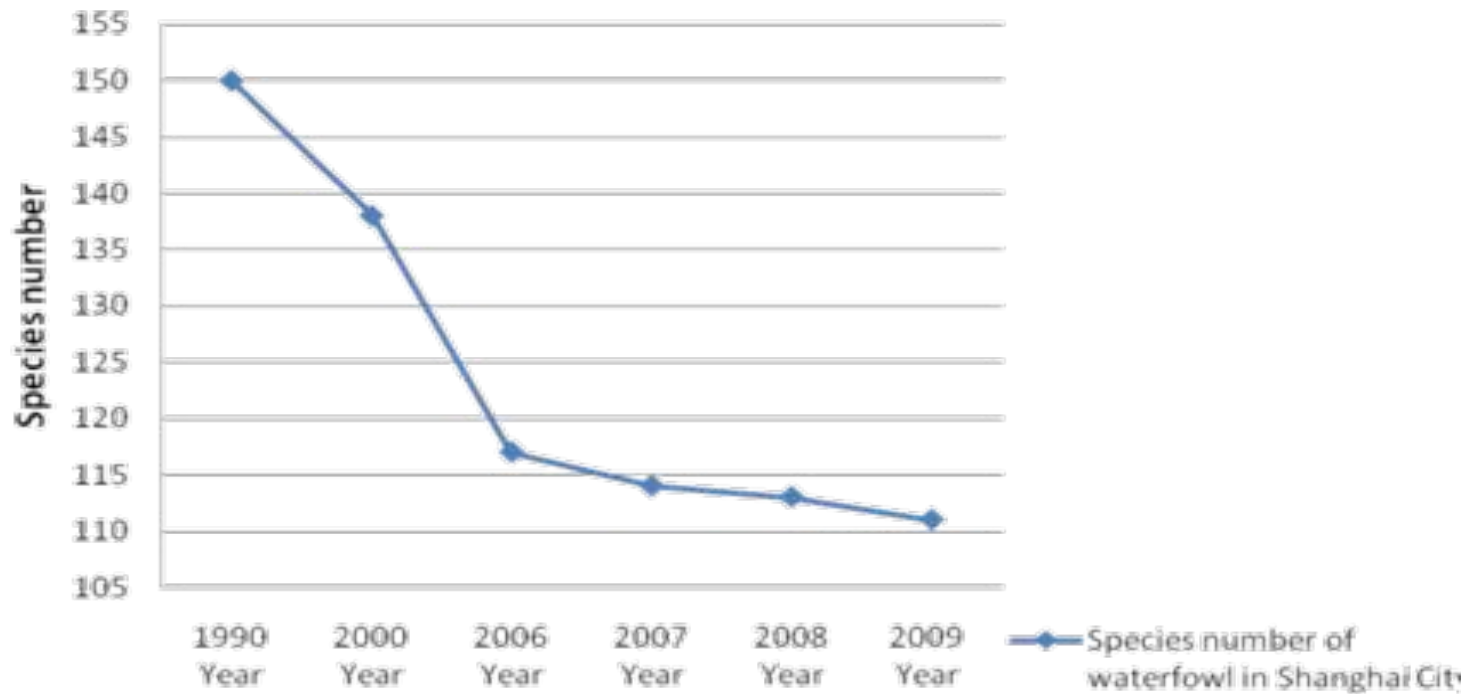
In all

- The area of all natural wetlands in different categories except for constructed wetlands has decreased in the past 20 years, while that of cultivated land, forestry and constructed land-use rising remarkably.

Effects

- Decrease of wetland area,
- Fragmentation of wetland landscape and destruction of the original habitat,
- Survival of wetland creatures is under serious threat, leading to the decrease in both species number and population size,
- Negative impacts upon biodiversity.

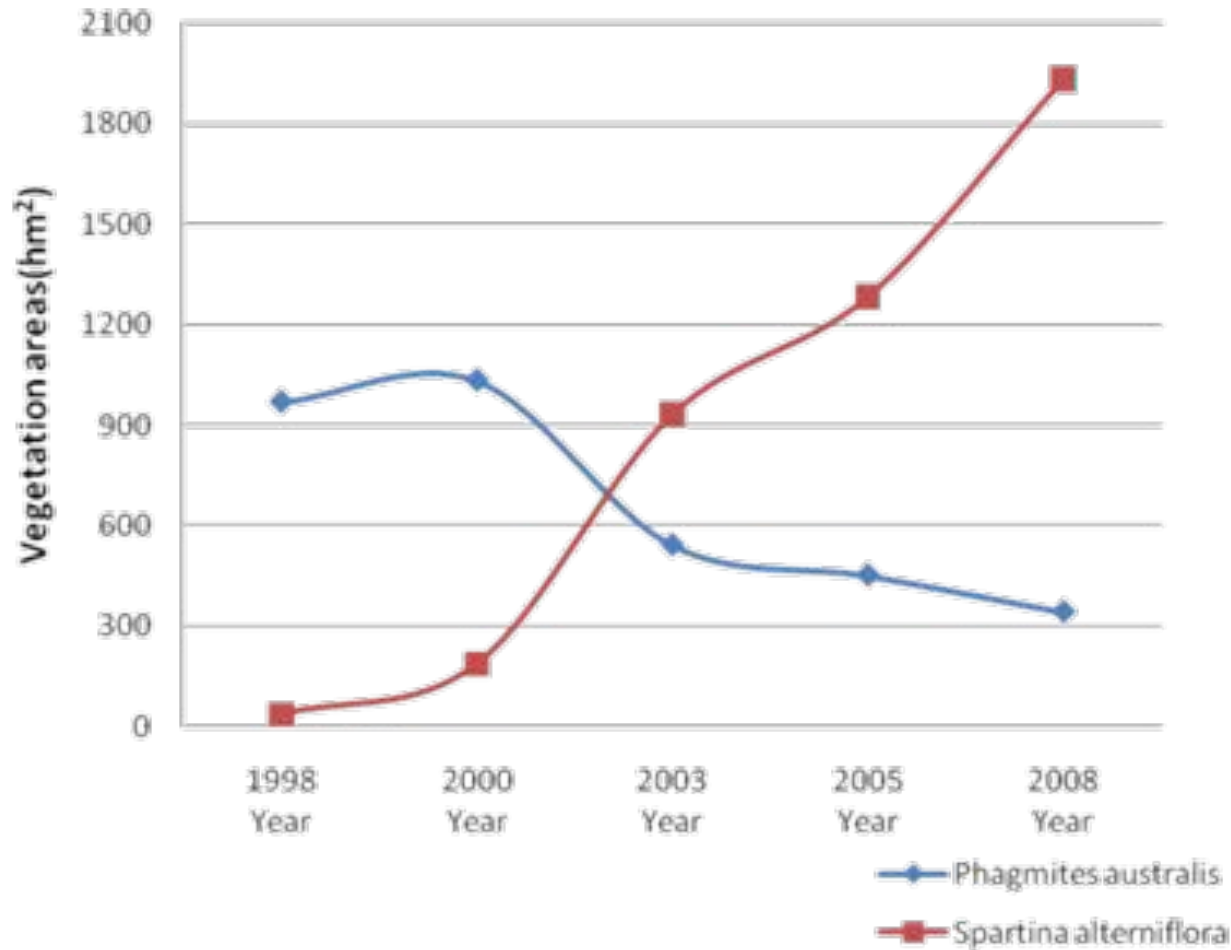
Alteration of waterfowl species abundance



Synchronized winter survey results of waterfowl in Shanghai city in 1990-2009.

- *Spartina alterniflora* are highly aggressive plants in coastal and estuarine wetlands worldwide.
- It was recognized as the only saltmarsh vegetation living on coastal mudflats, out of 16 most harmful invasive exotic species set by SEPA in 2003.

Alteration in saltmarsh vegetation of coastal wetlands



The changes in saltmarsh vegetation during the 1998-2008 at Chongming Dongtan.

Spartina alterniflora invade mangrove
roundly from north to south



Reasons – Human Activities Disturbance

- Agricultural reclamation is the direct driver and the change in hydrological regime is the indirect driver of wetland change
- And agricultural development tends to exert more impact on the quantity of wetlands than on their distribution patterns (*Zhang and others 2010b*)

- Climate change

- It is believed to be another significant influence factor in affecting biodiversity through influencing the geographical range of species, the composition of communities and accelerate alien species invasion, which dramatically causing biodiversity loss in many aspects.

- Biological invasion

- Impacts to vegetation distribution and structure
- Impacts to benthic and macrobenthic assemblages
- Impacts to waterfowls abundance
- ecosystems

Conservation strategies

- Strategies of prevention biological invasion
- Measures to recover from reclamation in wetland ecosystems
- Measures to protect waterfowl species



Thank you for all your
attention!