The environmental conservation in Yatsu wildlife protection area

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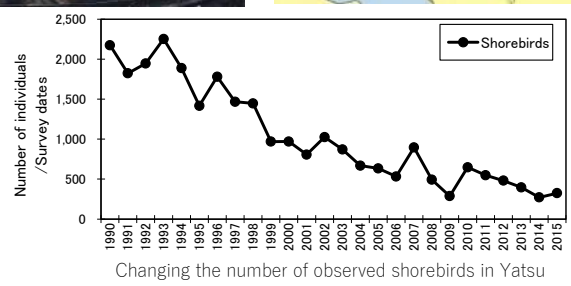
1 . Profile of YATSU HIGATA (Yatsu Tidal Flat)

- Yatsu Higata (Yatsu Tidal Flat) is a muddy/sandy tidal flat with the area of 40 hectares located at 2 kilometer inland of Tokyo Bay.
- Because of the various and large number of migratory shorebirds and waterfowls hosted by Yatsu Higata, it was designated as an official site of Ramsar Convention in 1993.
- More than 110 species of birds are able to be observed in a year including about 70 shorebird and waterfowl species. Since Yatsu Higata is a major stopover for migratory birds, we can observe large number of shorebird corresponding to 10% of entire shorebirds coming to Japan.
- In addition to the bird species, Yatsu Higata hosts many kinds of aquatic creatures such as fishes, worms, crabs, bivalves and so on. Abundance of the benthic species makes Yatsu Higata to good place for feeding and resting for migratory birds.
- Yatsu Higata is familiar to many citizens because it is located close to Tokyo.

■The environmental conservation in Yatsu wildlife protection area

- The Ministry of Environment designated Yatsu Higata as a wildlife protection area aiming to protect the environment for birds.
- Number of shorebirds migrating to Japan is decreasing recently. Comparing to 1993 when Yatsu Higata was designated as an official site of Ramsar Site Convention, the numbers of shorebirds decreased to be 1/4.
- The Ministry of Environment started conservation project in 2010 to improve habitat condition of Yatsu Higata to restore the number of the migrate birds.



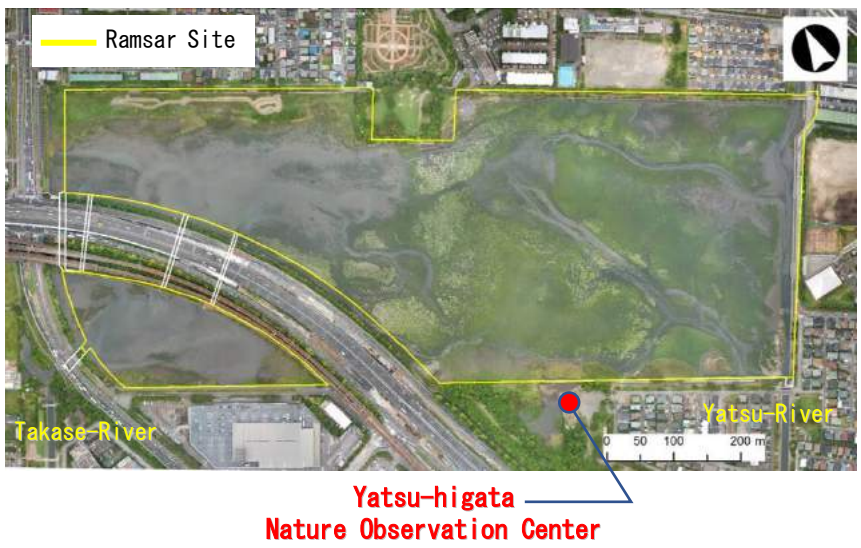
Changing the number of observed shorebirds in Yatsu

2 . Conservation Policy

- Because it is a valuable tidal flat left in the urban area, we aim to be a tidal flat where nature's activities and people's living can be coexisted, nature can coexist with people, and tidal environment and the living environment of the surrounding residents.

■Features of the Environmental Conservation

①**Understanding the Phenomena**→Investigation of countermeasures to reduce impact
②**Adaptive Management**→Small Scale Testing・Monitoring・Continuous Improvement
③**Regional Cooperation**→Information Sharing・Cooperation of government and region



■Conservation Targets

- We examined indicators to evaluate the tidal flat change and the effect of countermeasures and set quantitative conservation targets.
- In the short term, we are maintaining the current situation.
- In the long term, we are targeting the condition around the time of registering the Ramsar site (1993).

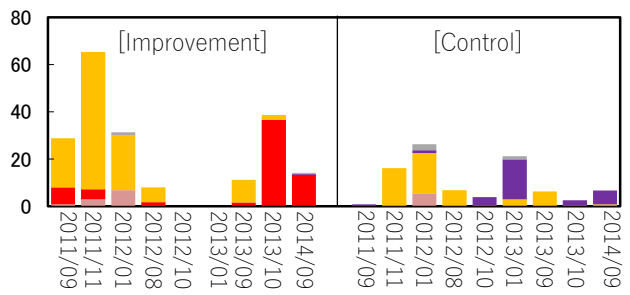
Object	Index	Current Situation	Conservation Targets
Reduction of Feed Place	Drying Area・Drying Time of Tidal Flat	2012 【0.55】 (After the Great East Japan Earthquake) Drying Area：22.2ha【0.93】 Drying Time：2.3 hours【0.59】	[Short Term] 2010【1】 (Before the Great East Japan Earthquake) Drying Area：24.0ha【1】 Drying Time：3.9 hours【1】 [Long Term]1993 (Estimate)【1.60】 Drying Area：28.2ha【1.18】 Drying Time：5.3 hours【1.36】
Changes in Quantity and Quality of Bait	Wet Weight of Polychaetes	Average Value of 2011 to 2014 :12.1g/m^2【1】	[Short Term] Maintaining the Current Situation：12.1g/m^2【1】 [Long Term]1995：22.7g/m^2【1.63】

3 . Conservation Measures

- IDEA Consultants is conducting scientific researches to support the conservation project of Yatsu Higata which is led by the Ministry of Environment.
- Environmental conservation and management methodology based on the monitoring results have been proposed by IDEA Consultants.

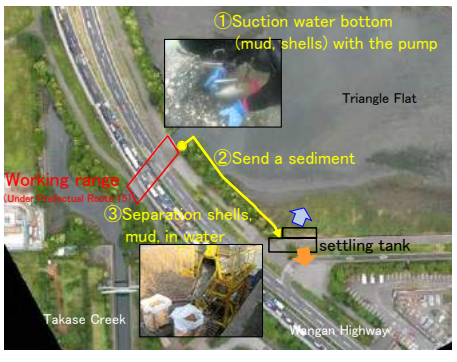
(1) Improvement of sediment condition for creatures fed by shorebirds

- The sediment condition of Yatsu Higata has been changing from mud to sand due to gradual discharge of mud.
- Along with the sediment change, worms and crabs that live in mud have been replaced with snails and bivalves that live in sand. Changing biota seem to be causing deterioration of feeding condition for shorebirds.
- We are trying to place back the original biota to improve the condition for shorebirds by replacing sediment; we replaced sandy sediment with muddy sediment in some areas.



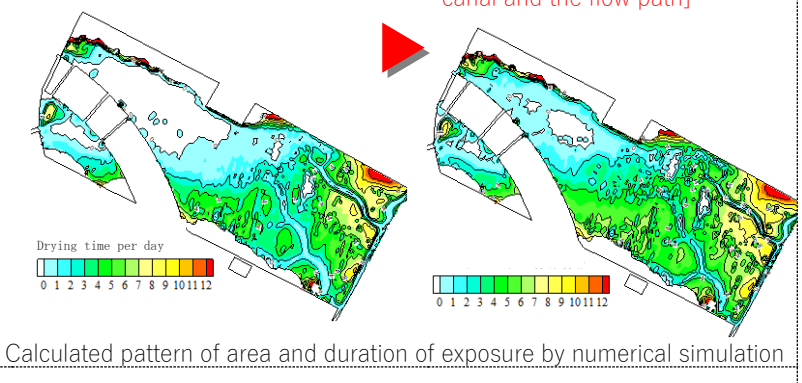
(2) Dredging in the canal and the flow path

- The elevation of the tidal-flat is becoming lower gradually because of the mud discharge through canals.
- Seashells accumulated in the canal and the flow path connecting to Tokyo Bay hinder the outgoing tidal flow from the tidal-flat. It causes reduction of exposed areas of the flat and the time duration to feed shorebirds.
- To regain the exposure time and the area, we are going to dredge in the canal and the flow path to improve water flow.
- We are investigating the ways of dredging not to effuse mud from tidal-flat based on the simulation results of sea water flow and topographic change.



Comparative evaluation of multiple countermeasures using hydraulic model

[Current] [Simulation in dredging in the canal and the flow path]



Calculated pattern of area and duration of exposure by numerical simulation

(3) Regional Cooperation

- Cooperation with local residents and related organizations, with the proper role sharing, we aim to consolidate with the region.

■Exchange of Opinions

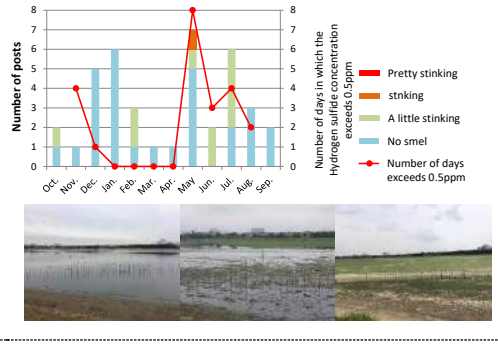
We hold a briefing session and reflect local needs in business. About 11 times the local briefing session and about 270 people participated.

■Spread Awareness

About 600 people took part with the event held six times.

■Web Monitoring

Approximately 50 participants posted 400 times.



■Collaboration

Government and the community are working together on conservation together.We carried out the removal of shells and bamboosa.