Creation of a Sandy Shore for the Endangered Tiger Beetle *Cicindela lewisi*

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1. Location

2. Mitigation for Tiger Beetle
   (1) Construction of the expressway
   (2) Endangered species *Cicindela lewisi*
   (3) Design of an artificial seashore
   (4) Observed number of *Cicindela lewisi* in the new habitat

3. Management of the created shore

4. Issues in the future
1. Location
In 1992, a shore was created along the Yoshino River. The location is marked on the map with a red circle.
2-1. Project plan

2000  Environmental impact assessment
2002  Mitigation plan determination
2005  Environmental Review Committee
       Construction start
2006  Development
       of corridors
2010  Completion

Shikoku crossing Expressway
In 1992

Created Shore (study site)

Route of expressway

2010.05.16
2-2. Endangered species *C. lewsie*

Nakasu (sandbox)

Okinosu (river mouth)

Higasi-kanjou Bridge (under construction)

Nest hole

15 - 20 mm

15 ~ 18 mm

4 ~ 5 mm
Food web with *Cicindela lewis*
2-3. Design of creation

- **Coastal plants**: Transplant, Seed stock
  - Carex pumila, Carex kobomugi,
  - Ischaemum aristatum, Vitex rotundifolia etc.

- **Beach inclination**: Gradual beach
  - 1/12.5 (upper MSL +1.0)
  - 1/25 (under MSL +1.0)

- **Bottom sediment**: Silt of 3%
  - Topsoil was carried

Main habitat of *C. lewisi* larva
- (MSL +0.8 ~ +1.1)

Habitat of *C. lewisi* larva
- (MSL +0.5 ~ +1.1)

Re-creation of the tombolo back
Completion of the creation

- **Wave Condition**: under 30cm = Very calm
Development of corridor (in 2006-2009)

Original habitat of C. lewisi

New shore

Corridor

Creation area

in 1992
2-4. Observed number

Completion of sandy shore (2006)
3. Management of created shore

1. **Opening to the public**
   - Purposes of creation
     - Compensation for the loss of the habitat of an endangered tiger beetle
     - Provision of amenity space
     - Disaster prevention

2. Environmental monitoring will be **completed** by the government in 2013.

3. Long term management system was **not established**.
Workshop of rulemaking at Okinosu-shore

- Considering the rules of the shore use and the systems of its management
- Submit of documents to the official meeting
  Decision of the rules by the government

Stakeholder (20 persons)
  = the locals, nature conservation groups, Tokushima government, researchers

Workshop = 3 times, News letter = 2 times
Range of *C. lewisi* and *C. elisae* in 2009

- Larvae of *C. lewisi*
- Adult of *C. lewisi*
- Larvae of *C. elisae*
- Adult of *C. elisae*
Installation of fence

Habitat of *C. lewisi* larva
Assessment of the fence for prevention of foot press

Intensity of the ground bearing capacity (kg/cm²)

- Before the opening
- After the opening

Penetration resistance measurement

Pathway
Inside 1
Inside 2
4. Issues in the future

1. Receiving local support
2. Scientific investigation of *C. lewisi* ecology
3. Long term monitoring
1. Okinosu Kaihin Tanoshimu Kai
(Enjoining the Okinosu shore)

- With local residents
- C. lewis is symbol
- With fun!
- Information sharing

→ Coastal environmental protection, Regional stimulation, Natural science education, Intergenerational cooperation ...
2. Scientific investigation of *C. lewisi* ecology

The information of *C. lewisi* is very limited.

- Regional distribution in Tokushima prefecture
- Experiment: Behavior and Interspecific relationship of larvae
- Food web: a stable isotope
3. Long term monitoring

• 2012: Discuss with stakeholders
  Making method
  Building a system

• 2013: Start of monitoring
We will report our action and results next EMECS 10!!

Thank you!