

## **【4-1801】**

### **Development of Measures for Expansion Prevention and Effective Reduction of Invasive Alien Species *Ludwigia grandiflora* subsp. *hexapetala***

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With the final goals of creating a management manual that enables the control of a specific alien plant, *Ludwigia grandiflora* subsp. *hexapetala* at a low density state and proposing technology to countermeasure councils, sub-theme (1) of this study addresses prediction of the potential habitats with high growth potential for this species from wave conditions, water levels, etc., with the main objective of clarifying locations with high extermination effect from the distribution of valuable plants to be protected.

From April to late July 2018, the results of the 2015 *Ludwigia grandiflora* subsp. *hexapetala* distribution survey in 132 areas of 53 districts along the shore of Lake Biwa were tabulated, and from August to late November 2018 by calculating the height of the significant wave in each community, a potential habitat map was created and bookletized using the ground height with high growth potential of the species as "Potential Habitat" (color 135 pages, 50 volumes). As a result, the area of inspection for removal was reduced to 40.1% of the conventional inspection area.

From 2018 to 2020, a regular survey of the distribution of *Ludwigia grandiflora* subsp. *hexapetala* was conducted once every two months in a reed community. As a result, it was possible to manage at low density by patrolling and exterminating once every three weeks.

Experiments on regeneration from fragments of various sizes were carried out, and the results showed that regeneration can be prevented by using a net of 1 mm mesh as an appropriate mesh size for fragment recovery after large-scale extermination.

This study demonstrated a simple observation method using drone technology, and it was shown that this simple method could be applied to 75.3% of potential habitats. That is, it would be possible to reduce observation work to 24.7% of that necessitated by conventional observation methods.

A protocol for detecting *Ludwigia grandiflora* subsp. *hexapetala* from environmental DNA in water was established, and after examination in the laboratory environment and a real environment, it was applied in 23 places along the Lake Biwa shore, and highly likely communities of this species were identified.

In coordination with sub-themes (2) and (3), a control management manual (132 pages) for specific alien species *Ludwigia grandiflora* subsp. *hexapetala* was created, and at the end of March 2021, it was distributed to Shiga Prefecture, the Ministry of the Environment, National Institute of Environmental Research, and National Institute of Aeronautics and Environmental Sciences.

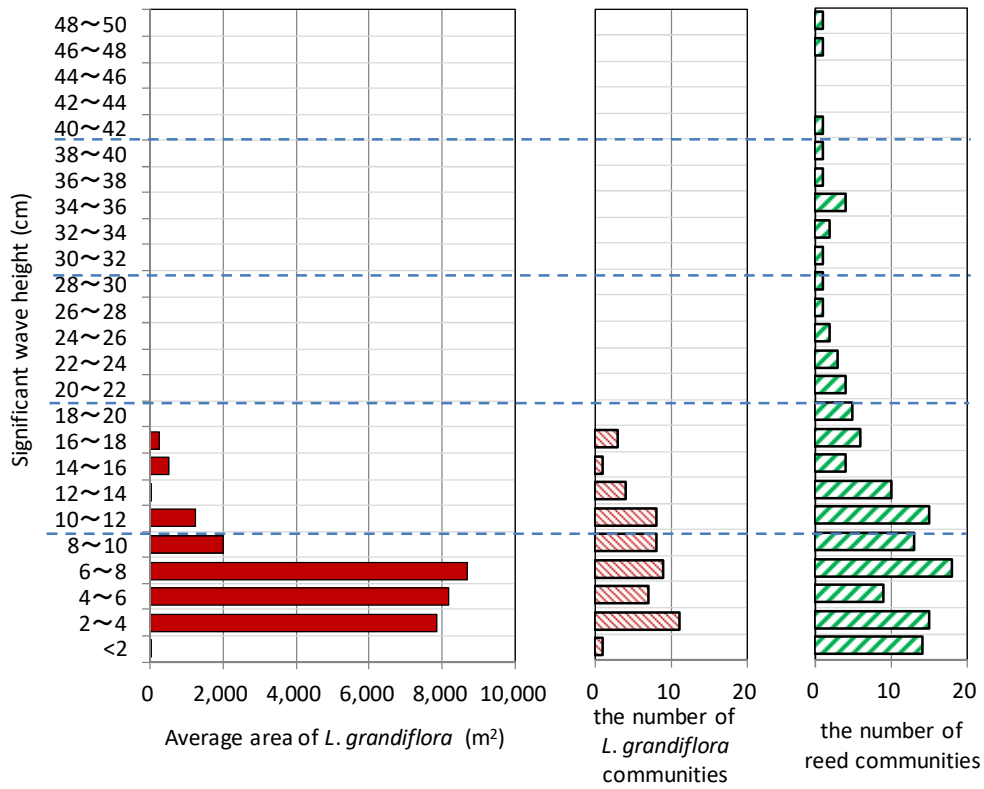


Fig.1 Relation between significant wave height and area of *L. grandiflora* on the Lake Biwa shore

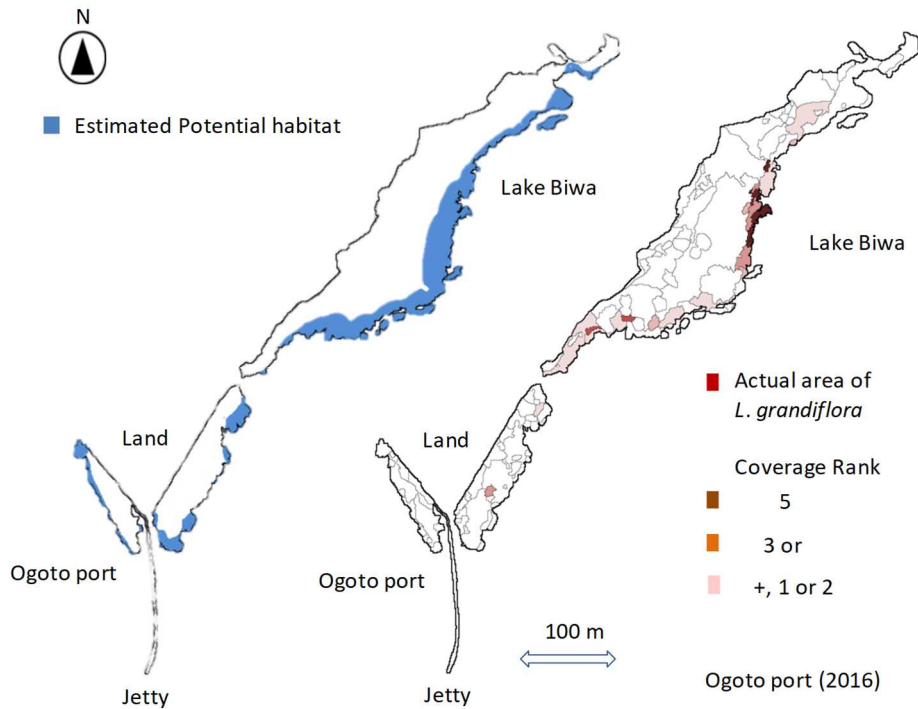


Fig.2 Comparison of estimated potential habitat map and actual area of *L. grandiflora*