

## Nagano Municipal Nobusato Elementary School, Grades 3 & 4

### Connections of Life in the Satoyama – What We Learned from the Shinai Topmouth Gudgeon

Third and fourth graders at Nobusato Elementary School focused on the conservation of the Shinai topmouth gudgeon (*Pseudorasbora pumila*), a rare freshwater fish native to their region. Through this project, they explored the value of life and the impact of invasive species by conducting hands-on learning activities – from observing eggs and raising fish to removing invasive species and even creating fertilizer – centered around a local pond near their school.

#### Hatching and Raising Juvenile Fish

Under the guidance of aquatic ecology expert Dr. Nakano, the students collected Shinai topmouth gudgeon eggs from the pond and successfully hatched them in their classroom. As they cared for the young fish – changing water, feeding them, and watching them grow – they developed a strong connection to the lives they were nurturing.

#### Facing the Challenge of Invasive Species

When preparing to release the fish back into the pond, the students discovered the presence of invasive red swamp crayfish. This led to a difficult decision: they would need to remove the crayfish to protect the Shinai topmouth gudgeon. Although some students struggled with the idea of taking lives to save others, they ultimately carried out a removal and repurposing plan, learning how to deal with ethical challenges in conservation.

#### Understanding the Web of Life

After the crayfish were removed, the students dried and crushed them to create natural fertilizer, which they used in their flower beds. They were excited to observe how well the flowers grew, and through this experience, they discovered that even invasive species can become part of a positive ecological cycle when thoughtfully repurposed. The project helped the children realize that all life is connected and that their actions can influence the health and balance of the local ecosystem.