Preserving the Native Eco-System of Lake Inbanuma

Team RISKIT
Sakura High School
Japan
Kyota Izumi
Sohei Kashima
Izumi Sasaki
Rei Takahashi
sakurasgh2016@gmail.com

1. Abstract

In the past few years in Japan, many places have had problems with invasive species. Lake Inbanuma is one of these places. Lake Inbanuma is near our school and Narita Airport.

There are many kinds of dangerous invasive species living and breeding in Inbanuma, for example, *Chelydra Serpentine* (the Snapping Turtle), *Procambarus Clarkii* (American Crayfish), *Micropterus Salmoides* (Black Bass), *Micropterus Salmoides*, and *Alternanthera Philoxeroides* (Alligator Weed). Especially, Snapping Turtles and Alligator Weeds can damage the native environment. It is not good for the environment and native species.

We are also nervous that the invasive species affect the environment even more. We are researching the most effective way to reduce the number of invasive species, and if it is possible, utilize them. We would like to make the environment better than it is now.

We will speak with qualified specialists, laboratories, and find ways to deal with this problem.

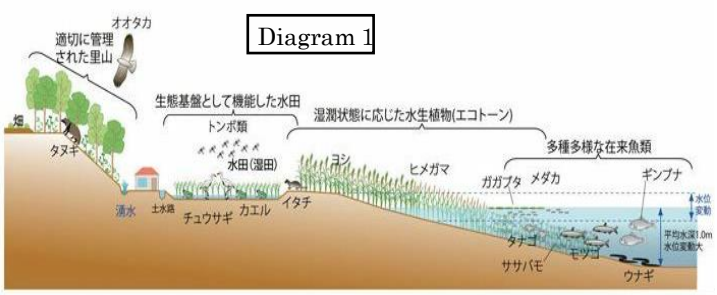
In July 2018, we will explain our findings.

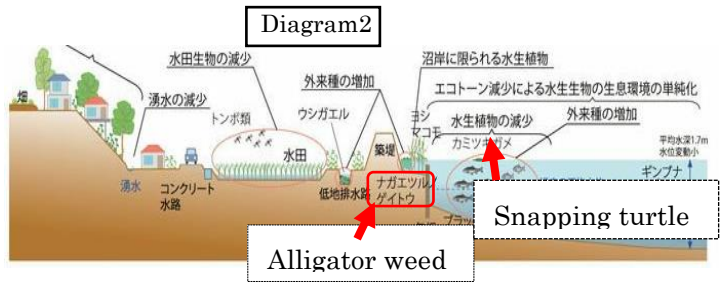
2. Key words

- **Original**
- **Sustainable**
- **Exterminate**
- **Invasive Species**
- **Youth**

3. Purpose

We learned that, currently, in various parts of Japan many eco-systems are being damaged by invasive species. Lake Inbanuma, which is near Sakura High School, also has an Invasive species problem.





http://inba-numa.com/より引用

We want to decrease the damage caused by invasive species and see if our research or methods can be used in other places that are experiencing the same problems. Diagram 1 shows the original Lake Inbanuma ecosystem, and Diagram 2 shows the present Lake Inbanuma ecosystem.

The Lake Inbanuma area is a place where many kinds of creatures live. But now, native species are being over taken by invasive species.

We want to make return the ecosystem back to its natural state. We found on the Lake Inbanuma information homepage that many people and organizations are working to decrease these species.

The government, universities, or companies have many plans and ideas, however there are not many ways for middle school and high school students to get involved in the Lake Inbanuma area. Middle school and high school students in Japan have a few programs and only a few students study the invasive species problem, but most students don't care about this problem. If there are groups which are created for these people, but they don't have the will to participate. This is a problem.

Now, not only animals such as Snapping

Turtle or *Microperus* (Black Bass) but also plants such as *Solidago Canadensis* (Goldenrod), *Eichhornia Rassipes* (Water Hyacinth) and Alligator Weeds can be invasive species.

岡山理科大学 生物地球学部 生物地球学科 植物生態研究室 HP より

Left : *Eichhornia crassipes* (Water hyacinth)
Right : *Solidago Canadensis* (Goldenrod)

These plants and creatures, are especially a threat to habitats near our homes. In addition, many organizations make efforts to solve the problems caused by these creatures. Humans brought both Snapping Turtles and Alligator Weeds to Japan. At first, people cannot determine whether these creatures would have an influence on environment or not, people are now aware that it has a bad influence on the environment. But when we realized the situation, it was already too late.

Of course, it is best to eliminate all these species in Japan. But it is very difficult because they have spread all over Japan, and the populations are huge.

4. Research

I. About the Alligator Weed.

印旛沼クリーン大作戦活動報告書より引用

Wikipedia より引用

Alligator Weed is a waterweed that is found in South America. It is perennial plant which grows in humid environments such as the banks of rivers and swamps.

This plant's vegetative reproduction is carried out in the stem segment of the plant and is extremely active.

At first, they were sold as the ornamental plants, however they were thrown away in the rivers and swamps, and as a result, they grew thickly on the riverbanks all over Japan.

They were found around Lake Inbanuma in the 1990s for the first time. Since then, they are taking over the rivers near Lake Inbanuma.

Alligator Weeds are designated the primary selected species of specified invasive species based on the Invasive Alien Species Act.

This law designates that a part of an alien species as invasive alien species which can cause damage or likely to cause damage to the ecosystem, human life, and agriculture.

They are the target of extermination. The Primary selected species contains what we have to eliminate immediately.

The reason why we are concerned about them is that they spread and occupy the surface of water.

As a result, native species which live in the same environment are eliminated as they grow thick on the water surface and shut the sunlight out, which prevents other species from carrying out photosynthesis. They restrict the current and make the water quality worse.

It is a problem that Alligator weed can grow from any piece of the original plant, and it makes colonies easily. Recently, in the Hanamigawa River which is near Lake Inbanuma, the plant's colony were turned out by flowing water and swept away. There was a risk of overflow of the river. So, people urgently removed the colony from surface of the water.

II. Interview about Alligator Weed

We asked Mr. Takeyoshi Tada who works at the River Environments Division, which is also a part of the Chiba Prefectural Government, about the problem. He participates in the program to try to exterminate the Alligator Weed.

One of the worst problems is there is a high possibility that flooding will spread the weed. In heavy rains, some of the plants are washed away by the river. As stated before, that plant can reproduce with only a leaf or stem. So any plant that is carried away, has the ability to grow.

If the Alligator Weeds choke up the pump which are used to keep the river level steady, a flood that may affect humans may also occur. A flood causes a lot of damage. For example, if a field is filled with too much water, it can damage the crops. So, we must exterminate it all costs.

However, that is another problem. Cost.

To exterminate the plant, we must start to cut down the weed around the river, because the weed can easily reproduce. As a result, the cost is not only to cut it down. It is also expensive to carry it away, and incinerate the Alligator Weed.

It is difficult to exterminate that plant, according to the website, so, we must find an effective way to exterminate it. The plant grows the fastest in summer, so we must exterminate it before its growing season (from May to June). This is the best way to take steps to exterminate it.

I. About Snapping Turtles

千葉県生物多様性センター
資料より引用

The Snapping Turtle has a strong jaw, strong limbs, thick sharp claws, a long tail, and a large body. Large ones are 50-centimeter-long. They mostly live in muddy waters. They sometimes go ashore, to move between bodies of water, and to lay eggs. However, during this time, is when they may come into contact with humans. Their powerful bite can easily injure anyone.

A lot of Snapping turtles were imported from Canada and North America as pets in the 1960's. Snapping turtle grow very large and very fast. Then Japanese people set them free in rivers or swamps.

A wild Snapping turtle was first found in the river near Lake Inbanuma flowing through our city in 1978. Then, they started to increase around 1997. The large ones have preyed upon native species and have taken away the places where native species lived. They have destroyed the ecosystem.

In 2015, the population living around Lake Inbanuma was about 16,000. However, this number doesn't include the turtles which live in paddies near Lake Inbanuma. So, the real number maybe larger than expected..

II. Interview about Snapping turtles

We interviewed Mr. Takeshi Imazu. He is a staff member of the Biological Diversity Center and an expert on tortoises and turtles. He has been collecting a lot of turtles including Snapping Turtles. Since he was a middle school student.

He has caught about 1,000 Snapping turtles during his career. In our interview, we learned that, the Snapping Turtle's breeding season is from the end of May to the beginning of June. They are frequently seen on the ground during this particular time.

The Snapping Turtle's habitat mostly overlaps with a native tortoise's. Mr.Imazu said "When I catch Snapping turtles, I catch *Mauremys reevesii* (Reeves Turtle) (a kind of native turtle) which are about 30 times as many as Snapping Turtles, and I have to examine all of those, so it is hard work to exterminate Snapping Turtles. Also, in his investigation, some people personally killed the turtles. So, they give the information to the city office or police office.

5. Result&Discussion

To secure a sustainable environment, we can all try to exterminate Alligator Weeds. However, Snapping Turtle extermination is difficult, because it is dangerous, and one needs a special license. There are also many legal issues. So, we think that we have middle school and high school students should participate in the project to help exterminate Alligator weeds. As for Snapping Turtles, students should share information about these invasive turtles and the current situation

6. Conclusion

After researching invasive species, we found that there are only a few groups for middle and high school students to participate in.

One of reason why these numbers are low is there is little information about invasive species, and people don't have the opportunity to learn about it. Because of this, they don't have the will or information to participate.

Therefore, middle and high school students need to know about the information. In order to secure a sustainable environment in and around Lake Inbanuma it is a responsibility for us and for those living in the area. So, we are planning to spread awareness about invasive species.

To do that, we are going to use social media, and share ideas by work with experts.

In July 2018, we suggest that, not only students who join school science clubs, but also all high schools in the immediate area should work together to help fix Lake Inbanuma.

7. Acknowledgement

We would like to thank
the Biological Diversity Center
Mr. Takeshi Imazu.
the Chiba Prefectural Government the River Environments Division
Mr. Takeyoshi Tada
NPO IVUSA
Sakura High School Teachers and Staff
Mr. Akihiko Ishijima
Ms. Yoko Otake
Mr. Koji Uchiyama
Mr. Jonathan Kangas

8. References

ナガエツルノゲイトウ、カミツキガメについての基本情報や図 .http://inba-numa.com/

岡山理科大学 生物地球学科 生物地球科 植物研究所 http://had0.big.ous.ac.jp/

環境省 http://www.env.go.jp/nature/intro/2outline/invasive.html

いんばぬま広場 http://inba-numa.com/what/syoukai/kasenryuiki/

環境省 循環型社会白書 http://www.env.go.jp/policy/hakusyo/h19/index.html

特定外来生物と外来生物法について https://www.env.go.jp/nature/