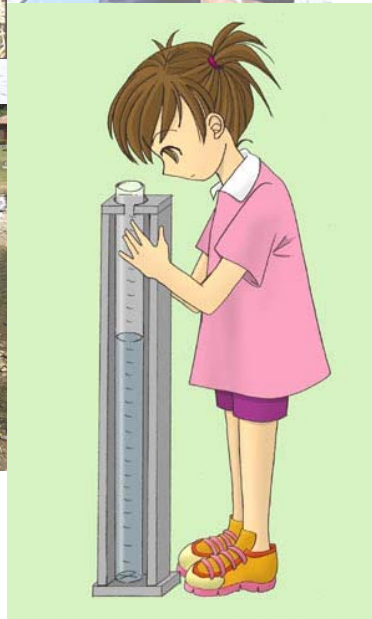
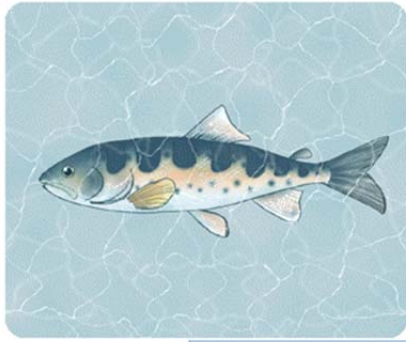
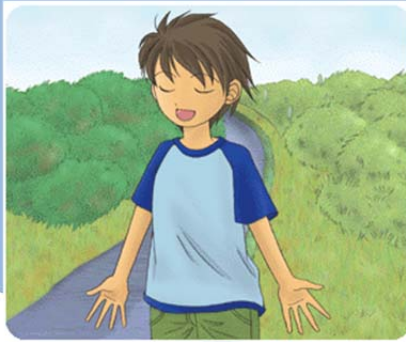


# Let's go to a river together !





- What can be found in a river?
- Let's observe it together!



Water Environment Soundness Index (MIZU-SHIRUBE in Japanese) – The nickname, MIZU-SHIRUBE, comes from a word for road sign, MICHI-SHIRUBE, and means a sign giving information or instructions to river users.

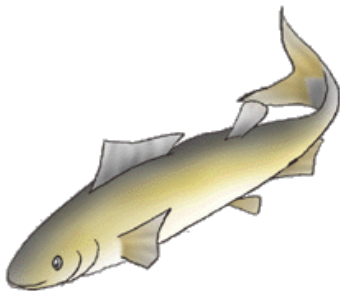


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<For instructors>

(1) Investigation period (2) Investigation site (3) Preliminary survey (4) Implementation of an investigation (5) Precautions for safety (6) How to use the investigation (results)





# 1. How to study the river environment

## (1) What are the characteristics of rivers?

- Rivers vary in size from large to small: large rivers that we need to cross by boat and small streams that run near our homes.  
River conditions vary from place to place from a river in a mountain to a river in a town.
- There are living things such as fish, crabs, insects, and aquatic plants in rivers.  
Grasses and trees grow at the edge of the river and birds living there too.
- Rivers have long been used for various purposes, such as fishery, agriculture, and drinking water. In addition, it is an important place for local festivals and traditions, for example the floating lantern ceremony.
- Each river has a different characteristic according to flowing water, scenery, living things and relationships with our lives.  
What are the characteristics of rivers near you?

## (2) How to investigate a river environment

- Five indices are used to investigate the whole picture of a river environment, including the river water, the living things, the scenery, and its use in our daily lives.
- Each index has three to five items (called separate indicators) used to investigate the river condition.  
Evaluate each separate indicator on a scale of 3 to 1 by observing the river conditions.  
If possible, write the reasons why you chose your ranking.
- You can start with any indicator that seems appropriate.

# Five Indices

1. Natural state

2. Rich in plants and animals  
(Biological diversity)

3. Water clarity

4. Pleasant waterfront  
environment

5. Regional water culture



## 1. Natural state

**This represents how much nature is preserved in the water environment.**

- Quantity of water                                There is an abundant flow of water even on days without rain.
- Condition of riverbank                        The river consists of natural soil, sand, or rock and is not covered with concrete.
- Can fish go upstream?                        Are there any obstacles in the river? Are there fish ladders?

## 2. Rich in plants and animals

**This represents the variety and quantity of plants and animals in the water environment.**

- Plants on the side of the river                Plants are growing on the sides of the river.
- Birds and bird habitats                        There are birds and bird habitats on the sides of the river.
- Fish and fish habitats                         There are fish and fish habitats in and along the river.
- Living things in the riverbed                Brown color algae are on the stones in the riverbed. Insects can be found.

## 3. Water clarity

**This represents how clean and clear the water is.**

- Transparency                                    The transparency is measured to investigate how clear the water is.
- Smell of the water                              The water's smell is checked to identify whether dirty water is flowing into the river.
- COD (Chemical oxygen demand)            The COD is measured to investigate how clean the water is in an optional investigation.

## 4. Pleasant waterfront environment

**This is investigated by the human senses: How beautiful and pleasant is the water environment?**

- Scenery (feel)                                    Is the river scenery pleasant?
- Trash (visual)                                    Visual state of the river and riverside: trash, etc.
- Touching the water (touch)                    The feeling on your hands and feet when you touch the water or go into the river.
- Smell along the riverside (smell)            Characteristics and intensity of the smell along the edge of the river.
- Sound along the river (audial)                Characteristics and intensity of the sound along the edge of the river.

## 5. Regional water culture

**This represents the relationship between the water environment and the people.**

- History and culture                              Historical and cultural stories related to the river.
- Accessibility to the riverside                Is the edge of the river accessible?
- Daily use    Is it used for walking or sports activities on a daily basis?
- Industrial activities                              Is it used for fishery or drinking water?
- Environmental activities                        Is it used for environmental education or clean up activities by the local community?

### (3) Five indices

#### 1. Natural state

Investigate how much nature is preserved in the river.

The following are three separate indicators to investigate the river condition.

- Is there an abundant flow of water?
- Does the riverbank look natural?
- Can fish go upstream?

Choose the appropriate answer for each question on a scale of 3 to 1 according to the river condition. Write the reasons for your choice. The details on how to choose the scale are explained in the following pages.

Question \ Scale	3	2	1	Reasons for your choice
- <b>Is there an abundant flow of water?</b>	Abundant flow	Some flow	No flow	
- <b>Does the riverbank look natural?</b>	Natural	Restored, but looks natural	Restored with much concrete	
- <b>Can fish go upstream?</b>	Yes. Fish can go upstream.	Yes, by using devices such as a fish ladder	No. Fish cannot go upstream due to obstacles.	





### 1. Natural state

- Quantity of water

Is there an abundant flow of water?



Referring to the following pictures, observe the river condition. The numbers in parentheses are the scales. Choose the most appropriate scale.

#### Abundant flow (3)



#### Some flow (2)



#### No flow (1)

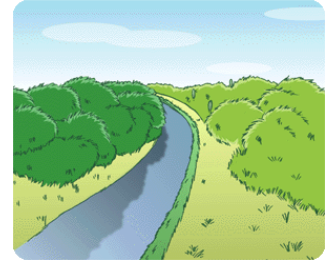




## 1. Natural state

- **Condition of the riverbank**

**Does the riverbank look natural?**



Observe how much of the riverbank is natural and how much is covered with concrete.

Bank protection functions to make the riverbank stronger against floods. It also has an important function for the lives of plants and animals and the relationship between people and the river.

Natural (3)



Restored, but looks natural (2)



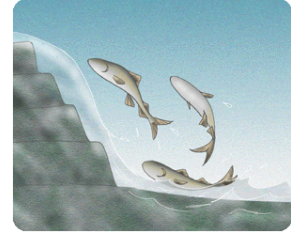
Restored with much concrete (1)



## 1. Natural state

- Can fish go upstream?

Are there any obstacles? Are there fish ladders?



If there are weirs or man-made structures in the river, fish or another aquatic animals cannot go upstream freely. Observe man-made structures that obstruct the movement of aquatic animals.

Fish can go upstream (3)



There are some devices such as fish ladders (2)



How can I go upstream?



Fish cannot go upstream due to obstacles (1)





## 2. Rich in plants and animals

Observe whether there are many living things in the river and its surroundings and whether it is biologically diverse. The following are four separate indicators to investigate.

- Are plants growing on the sides of the river and along the riverbank?
- Are there birds? \*For “habitats,” see the columns on the following pages.
- Are there fish?
- Are there living things on the bottom of the river?

Question \ Scale	3	2	1	Reasons for your choice
- Are plants growing on the riverside and riverbank?	Abundant variety of plants	Plants are here and there	No plants	
- Are there birds?	Many water birds and bird habitats	Not many birds or habitats	No birds or habitats	
- Are there fish?	Many fish and fish habitats	Not many fish or habitats	No fish or habitats	
- Are there living things on the bottom of the river?	Sand and stones are slightly covered with algae. Insects can be found.	The surfaces of stones are slimy in the presence of many algae.	The bottom of the river looks dark, and no algae or insects can be found.	







## What is a habitat for living things?



- What is a habitat?  
It is a home for living things, and a place to live.
- What is the habitat for?  
What do you do in your home?  
We eat meals, sleep, and have fun.



Where in the river do fish eat meals and rest?

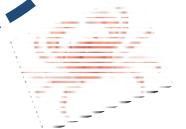


How about birds in the river?

How about small organisms in the riverbed?



**A habitat is an important place for living things.**

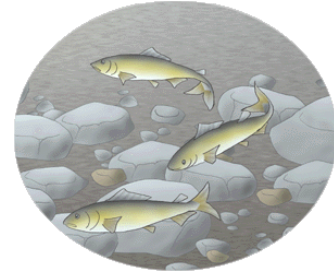




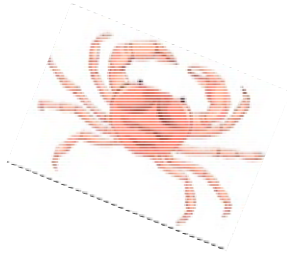
## Let's find habitats!

- Where are fish habitats?

Behind stones where fish can find foods, such as algae and insects In the water plants where they can hide



- Where is a habitat for small organisms in the riverbed?



On the underside of pebbles and in water plants

Let's turn the pebbles in the riverbed upside down. Do you find small insects?

- Where are bird habitats?

In the river where they can find foods, such as insects, fish, and water plants

In water plants and grass or on trees where they can sleep or make nests



## 2. Rich in plants and animals

- **Plants along the riverside**

**Are plants growing along the riverside?**



Investigate the plants on the side of the river. Rich plants provide a place for many animals to live. Observe the condition of the plants along the riverside and the riverbank at the investigation site.

### Abundant variety of plants (3)



### Plants are here and there (2)



### No plants (1)

