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## Tributary 5: Stakeholder Perspectives

Is this a problem? Is this an opportunity? Might it be both? These are questions we humans wrestle with regularly when we consider the world around us. Some issues are easily defined as a problem, such as a lack of clean drinking water, access to nutritious food, or bullying. Others, such as the construction of a dam or even breakwaters, are more complex, with a mix of associated problems and opportunities. Sometimes we can't even agree that a problem exists. You saw this as you read through the articles about the dam in the last chapter. This makes the next layer, developing solutions to the problems, even more fraught. It also keeps life very interesting as we try to find the best path to a solution through conflicting needs and values. And somehow, we need to teach all this to our students—the decision-makers of the future.

As people, our perspectives are driven by our experiences in the world, and how we interpret them. Pause for a moment, wipe your mind clean and then look at something outside. Don't name, label, or interpret. Just pay attention to what is happening *outside* of you, independent of you, without processing it through your own mind. How long does it take before your mind starts generating a variety of thoughts and opinions about what you are observing? It likely starts immediately! You've had this happen countless times already. Stepping outside our own busy minds is really difficult, and feels nearly impossible, and yet . . . keep doing it so you can see more clearly.

Our experiences and how we interpret them spring from the value and belief systems we learn within our culture and hold as truths. We navigate the world through these lenses. The European colonists who first came to the United States brought with them very different ideas of interacting with the land and waters than those customs, traditions and mindsets held by the native peoples. This led to a terrible and destructive conflict, and consequently, the loss of people who held valuable knowledge (Traditional

Ecological Knowledge, TEK) and singular cultural mores. Moreover, the culture of the new dominant group, which was very much focused on taming the wilderness rather than coexisting with it, has persisted into today resulting in numerous environmental crises.

Bias, which I just expressed in the last sentence of the previous paragraph, is the word used to describe how our beliefs and values color and influence our understanding and our decisions. Bias can lead us to dismiss compelling and credible evidence that might be right in front of us. Therefore, it is important that we consider the perspectives of stakeholders and the thinking that underpins them to better develop lasting solutions to complex environmental challenges. Our understanding of stakeholder perspectives is strengthened when we understand our own value systems first. And for our students, self-awareness about the influences on one's decision-making is a fundamental social emotional learning skill.

There is yet one more factor to take into account when considering stakeholders, and that is, the amount of power and influence they wield. The perspectives of some stakeholders carry considerably more weight than the perspectives of others. You will likely spark some lively discussions with your students about this criteria. Lastly, some stakeholders, like wild nature itself, are stakeholders whose needs may be overlooked, unless they are voiced by those who advocate for them. Let's put some of these ideas together as we revisit the Conowingo dam, and its impacts on migratory fish.

### Stakeholder Definitions

**Stakeholders:** The individuals or groups who are impacted by the issue.

**Positions:** Where the different stakeholders "stand" on the issue; what individuals think should be done to resolve the issue.

**Beliefs:** Ideas held by individuals that are believed to be true, even though they may not be based upon facts.

**Values:** The ideas which help an individual decide what is important and worthy. Everyone has personal values which are based on past experiences and acculturation. Money, status, beauty, family, friendships, religion, environment, and health, are just some of the many things to which people assign value.

**Needs:** Visualize Abraham Maslow's pyramid here!

#### Assignment 5a. What Do You Value, and Why?

This assignment is for your eyes only, or for the eyes of someone close. We won't ask you to share these with us. You can if you want to, however. Make a list of your personal values. I think the best way to do this is to quickly write the first five that come to mind. Later, you can edit them and add more. Next, briefly describe how each influences your decision-making on a typical day. Lastly, think about how you learned them. What cultural influences and experiences contributed to and shaped the values you hold?

#### Assignment 5b. The Value of Fish

Let's revisit our assessment of Exelon's spending on migratory fish. In the previous section, we assessed the value of these fish by only looking at their economic value. Can you identify other values we can ascribe to these fish? Let's examine this question of whether Exelon should spend this much money per fish by looking at other values. You can use the following list to guide your thinking. Please note, however, that this is not a comprehensive list. You will probably think of many additional values that shape people's' day-to-day decision-making.

**Intrinsic value** - A subject or an object has value simply because it exists.

**Extrinsic value** - A subject or an object is assigned a value by a third party.

**Aesthetic value** - A subject or an object is considered beautiful.

**Utilitarian value** - A subject or an object is useful to people in some way.

**Economic value** - A subject or an object has a monetary value attached to it.

**Ecological value** - A subject or an object performs essential function in an ecosystem.

**Cultural value** - A subject or an object is significant for spiritual, religious or other reasons.

### What's Your Source?

As teachers we are trained to question sources, but students growing up in the digital era can always use an extra reminder to be skeptical. Below are some points to consider with your students.

We live in an age of information, which can be a huge benefit to us as we work to solve issues we face. At the same time, much of the information available is from sources that aren't always accurate or true. Worse yet, the algorithms used for online searches can lead users to only see a limited and targeted fraction of available information. All this means it can be difficult wading through the information to find the most balanced and reliable information.

A way to determine quality sources is to ask, "What's your source?" If the source is a peer-reviewed scientific journal, reputable newspaper, or magazine, then confidence in that source would be higher than a Facebook headline or Wikipedia article. Information in journals, reputable newspapers, and magazines is typically reviewed for accuracy, whereas many other sources are not. Sometimes there is accurate information on Facebook and Wikipedia that comes from valid sources, but you need to drill down to determine the original source of the information. Just because it is on the internet does not make it valid, a point you may need to repeat to your students often!

Get in the habit of politely asking, “What’s your source?” when discussing issues with other people. When you hear someone state what sounds like facts, asking about their source might reveal that the “facts” might just be beliefs.

## Migratory Fish Stakeholder Positions

The process of identifying stakeholders and their positions is a critical part of the process of taking action. When you work with students, they will need to identify and talk to the people involved, to find out how they are impacted by the problem and how they might be affected by the different solutions that are proposed. Developing perspective-taking skills is critical to your students’ social emotional development. Let’s review the dam construction timeline and impacts.

### **Conowingo Dam- Migratory Fish**

American Eels, American Shad, herring, and other fish native to the Chesapeake Bay Watershed had free range to travel between the Susquehanna River tributaries and the sea until 1928. At that point, a 100 foot wall of concrete blocked the fish trying to move upriver. Giant spinning turbines and wildly fluctuating water pressure disoriented and injured fish traveling downstream. Over time, the populations of American Eel and American Shad, both migratory fish species, declined.

As **catadromous** fish, American Eels live most of their lives in freshwater a considerable distance inland, and move to saltwater to spawn. American Shad are **anadromous**, moving from saltwater, where they live most of their adult lives, to freshwater to spawn. Unlike many salmon species that die after spawning, shad can complete this breeding journey from saltwater to freshwater multiple times. A third species, Eastern Elliptio, a freshwater mussel that filters the water flowing into the bay, has a symbiotic relationship with the American Eel, and has also been impacted by the dam. When the water temperature is warm enough, the mussels release a matrix containing “glochidia,” a larval form, into the water. The glochidia stick to the eels’ fins

and gills when they swim through the net-like matrix. The glochidia develop as they are transported upstream by migrating eels, and then fall off to continue their lives in freshwater stream bottoms. The mussels are dependent on the eels to distribute their larvae. When the eel population declined, the mussels also declined.

While the American Eel is considered globally endangered by the International Union of Concerned Scientists (IUCN), the United States Fish and Wildlife Service (USFWS) has not listed them as federally endangered. Two-thirds of the eel harvest in the US takes place in the Chesapeake Bay and eel populations there are at an all-time low. (Blankenship, 2015). They have declined 50% between 1994 and 2004. (Dever, 2009). Elvers, which are juvenile eels moving upriver into increasingly smaller tributaries, can't use the fish lifts designed to move other fish species above the dam. The USFWS in Maryland relocated 15,000 elvers and 150 adult eels in tributaries above the Conowingo dam in 2009 to see if that will help stabilize the population (2009). There have been additional restoration initiatives, including the installation of an eel ladder, which funnels the migrating elvers into a collection container. After the captured eels are counted and measured, they are transported to upstream locations by truck. The catch in 2016 was the lowest since the eel ladder was installed in 2008, with 2,684 elvers collected (Reilly & Minkinen, 2016, p. 12). The highest number of elvers collected at the site in the same window of time was 293,141, in 2013 (p.12, 2016).

It is far too soon to tell if the restoration initiatives are stabilizing the eel and mussel populations, or are not having the intended effects. What seems clear, however, is that the dam had an unintended significant impact on the ability of multiple species to live out their life cycles.

American Shad are also in decline. Shad harvests in Maryland fell from a peak of 7 million pounds in 1890 to just 24,000 pounds in 1980. The fish lift built in 1991 appeared successful initially, but the population continues to decrease. A handful of biologists have concluded that less than 3 percent of spawning American Shad are able to get

past all the dams blocking three East Coast rivers, including the Susquehanna River. (Wheeler, 2013).

The dam is not the only stressor on the fish populations. Shad and eels have also been overharvested. Overfishing, along with factors such as non-native predators being introduced and dams preventing migration, have all contributed to their current low numbers.

The questions for stakeholders include: What should be done about the decline in migratory fish populations along the Susquehanna River? Who should fix the problem, and how?

Assignment 5c. Who Are the Stakeholders. What Are Their Perspectives?

Read the following articles and identify the stakeholders who have a hand in influencing and making decisions related to fish populations. Fill out a stakeholder position chart found in **Teacher Resources**. When doing this, peel back the layers of words to get to the heart of what might be underlying their position, what values they might be expressing. While you are going through this process, consider whether or not people are the only stakeholders. Are other species also stakeholders? If they are not stakeholders, could that position itself be a form of bias via an anthropocentric view of the world? Lastly, look at where the power and influence lies. Do some stakeholders have a greater influence on solutions than others? How does the power balance shape the final outcome?

**Article 1:** *Judge to hear arguments over fish passage at Conowingo Dam*

*Exelon challenges biologists' recommendations for upgrades and offers an alternate plan*

[http://www.bayjournal.com/article/judge\\_to\\_hear\\_arguments\\_over\\_fish\\_passage\\_at\\_conowingo\\_dam1](http://www.bayjournal.com/article/judge_to_hear_arguments_over_fish_passage_at_conowingo_dam1)



**Article 2:** *Scientists find shockingly good news about eels in PA river. Not only were stocked eels faring well in Buffalo Creek, but there is hope for restoration of Eastern Elliptio mussel population.*

[http://www.bayjournal.com/article/scientists\\_find\\_shockingly\\_good\\_news\\_about\\_eels\\_in\\_pa\\_river](http://www.bayjournal.com/article/scientists_find_shockingly_good_news_about_eels_in_pa_river)

## Identifying an Environmental Issue

By this point in the course, you have likely identified an environmental issue you would like to investigate. While we used a dam as a focal point for looking at two problems from multiple perspectives—migration blocks and sedimentation—you likely have discovered something else, perhaps something more subtle that you would like to investigate. Whatever you decide to investigate more fully, please make sure that your research will lead to findings that will advance our understanding and teaching of freshwater health.

### Assignment 5d. Identify an Issue

Please gather the following pieces of information from which you will choose a river or stream issue to investigate:

- The issue list you began in Tributary 2.
- The problems identified when you completed the stream corridor problem assessment in Tributary 3.
- The findings from the stream health assessment completed in Tributary 3.
- The questions you wrote in your journal while sitting by a stream. What are the issues to which they point?

Read through each of these to see if there are any themes in common, any issues you find particularly interesting. Any intersections of issues would warrant further study. Please choose one. Please keep in mind the process through which you arrive at an issue does not need to unfold in a linear, stepwise fashion. A question that has your

attention can lead you to an issue rather than the issue needing to be identified before you can develop a research question.

My River or Stream Issue:

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#### Assignment 5e. Literature Review

Briefly conduct background research to find out what is known about the issue, and what has already been done to address or resolve the issue. Record what you find in your journal.

#### Assignment 5f. Identify the Stakeholders for the Selected Issue

Identify the major stakeholders for the issue you selected. You may need to spend some time interviewing them if articles are not readily available for the issue you selected. Use a stakeholder position chart to map out their positions, values and level of influence, as best as you can. You can always return later on to fill in more information as you discover it. When finished, take time to refresh your mind with a visit to your local stream.

## Stream Visit

Estimated time for this stream visit: 1 hour

*What you'll need: Journal, regular and color pencils, something to sit on.*

### Contemplate: Sit Spot Visit 5. Beholding

Once you are settled in at your place, find a subject to behold. Here is what we mean when we ask you to behold: Look at the subject with sustained attention and complete openness. Really, really look. Not intensely, but leisurely, thoroughly. Try to enter your subject's reality, its truth, as best as you can. What do you notice? What might life be like for this subject? Stay with it, continuing to look. To behold.

When you are finished, write a few thoughts about those beholding moments in your journal. Record the very first thoughts that pop into your mind.

### Investigate: Nonhuman Stakeholders

Who are the nonhuman stakeholders present at your sit spot? What do they need?

### Reflect: Nonhuman Stakeholders

Now that you have perhaps beheld one of the stakeholders at your sit spot, might you consider its position differently? Explain your thinking in your journal using a few sentences.

Hold on tight to what you have discovered and considered. Then, when you are ready, consider the following:

By sitting silently by the water and activating your senses to make keen observations, you have begun the process of knowing a stream or river.

How else can we get to know a place?

Another species?

A person?

Just like other people have much happening beneath the surfaces they present to the world, so do streams, rivers and other ecosystems. Much is happening on and beneath the surface. Sensory ways of knowing a place can be extended and expanded by getting to know a place from another perspective, a scientific one, using scientific protocols. Thinking about our emotional connections to a place adds another perspective. Combining these multiple ways of knowing provides a multifaceted and nuanced approach for learning about waterways (and other ecosystems), and how our actions affect them. It is our hope that after you complete this teacher course you will feel confident sharing these techniques with your students, who will, after working through the same learning sequence, develop action projects that result in solutions to

benefit their communities. And in the process, think about how it is that we come to know.

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**Two suggestions for further reading:**

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Island Press.

## Interlude 5

Undulating lines of yellow light  
whip across the river's surface and splash onto the sky.

The moving river becomes the clouds.

The restless clouds

dissolve

to flood the river.

Water

Light

Merge, separate.

This intricate immutable dance transcends time.

*—K. Chambliss*

