

Fitting Environmental Education in Crowded Elementary School Classroom Schedules

Presented by:

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Who are you?

(Feel free to raise your hand for multiple categories)

Educators:

- K-12
- College/Tech School/Vocational School
- Community – Provenance/State funded
- Community – City funded

Current Students

Researchers

Resource Professionals

Here because I care about water!

Other

Who am I?

Learning, Environment, Action & Discovery (LEAD) Director – 2 yrs

- 15+ years of invasive species removal and native species promotion and protection.

AmeriCorps College Access Corps Coordinator

- New program through WWU's Huxley College of the Environment to teach about access to STEM and GreenSTEM higher ed & careers.

What did we do?

Tried to integrate 15 hours of new College Access Curriculum into local 5th classrooms who were attending North Cascades Institute's Mountain School for 2.5 days in the spring.

8 hours of new curriculum happened at mountain school and 7 hours happened in their classrooms.

I recruited 9 WWU students who were trained as College Access Coaches – one per classroom

What did I learn?

(For Washington State) Teachers only have time to teach lessons that pertain to standardized tests that happen spring of 5th grade.

Even if teachers believe in the value of new curriculum, most available teaching time is used for improving math skills.

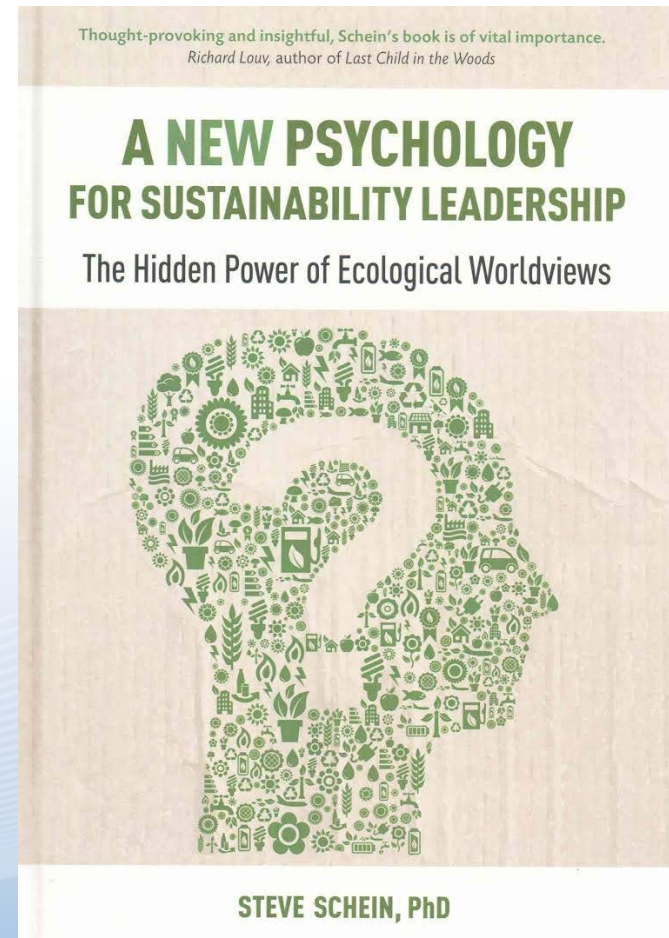
5th grade students learned the most about College Access through interactive activities and games.

An idea is born...

Ocean Wars: Northwest

A game to be used in multiple ways during recess, physical education and other free time.

Relied heavily on Steve Schein's 2015 publication...



Ocean Wars: Northwest

Native or Invasive Species Guessing Game

What is a Native Species?

Any species that lives in a place naturally without any help from people to start living there. Native species can be endemic (found only in one place) or indigenous (found in that place and others). Just because Native Species didn't need our help starting to live in a place doesn't mean that they don't need help now.

One of the biggest threats to native species are invasive species (see What is an Invasive Species? card). About 40% of native species are threatened or endangered because of invasive species.

How can you help native species?

- >> Learn to tell the difference between native and invasive species so you can report any sightings.
- >> Make sure that you and other adults only purchase native plants for your home and garden and remove as many invasive plants as possible.
- >> If you go boating, make sure to check for invasive species or things they can attach to on the boat hull, engine, fishing gear, car tires, your shoes and anything else that touched the water.

What is an Invasive Species?

Any species of plant, animal or fungus that did not start living in a place on its own (also called non-native); it was brought (introduced) by people. The ways that people usually move non-native species is by boat (see Ocean Vessels card), in shipping materials or containers, as pets and because they want to grow something different. They often do not realize that bringing non-native species can cause harm to the environment, jobs and health of plants, animals and people.

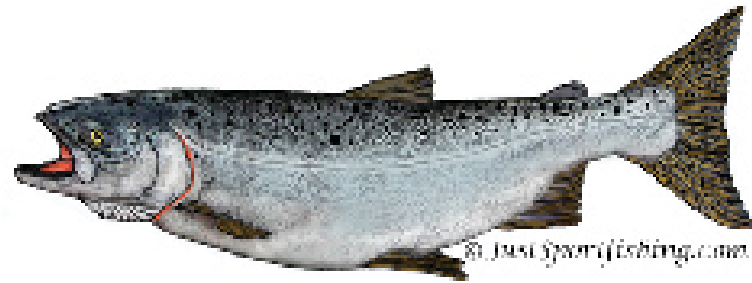
How do non-native species become invasive?

- >> If they don't have any enemies that eat them, their families can grow too quickly and take space away (home or habitat) from native species so they have nowhere to live.
- >> Some eat the same foods (or nutrients) but eat too much or too fast leaving nothing left for native species. Some even eat native species!
- >> Others bring sickness (disease) that harm native species' health and ability to grow their family, eat favorite foods or find a home.

Challenge Level 1:

Guess whether each species is Native or Invasive.

Ocean Wars - NW



They can be blue-green, red, or purple on their back and top of their head. They have black spots on their silvery sides and tail. They also have black on their mouth and tongue. They can be from 60-150 cm long and weigh from 4-45 kg. Their coloring changes when they leave the ocean to go to freshwater rivers to lay their eggs - known as spawning.

Challenge Level 1:

On the back, there is more information that the students can read and begin learning for Challenge Level 2.

Native Species

Chinook “King” Salmon

Scientific Name: *Oncorhynchus tshawytscha*

Type: Fish

Native Home: Oceans from California to Alaska but grows its family in large **freshwater** rivers.

About: They are the biggest salmon and are a **keystone** species in the Northwest. This means they are very important to the **food web** because they feed many other local native species: Orca whales, bears, seals and large **birds of prey** (including the Bald Eagle - America’s National Bird). They are also an important source of food and income since people fish for them as a job.

Problems: They are **endangered** species in California and the Columbia River Basin. They are **threatened** in other places because of over-fishing, dirty water and changes to their homes because of people. People have built dams, moved rivers and cut down trees. This makes big rivers more shallow, with more floating dirt and **higher water temperature** - all which kill salmon before they can grow their families.

Challenge Level 2:

Guess their common name, type and native home.

Challenge Level 3:

Guess more about the species and what problems they have or are.

Invasive Species

Asian Clam

Scientific Name: *Corbicula fluminea*

Type: Mollusk-Bivalve

Native Home: Japan, China and Korea.

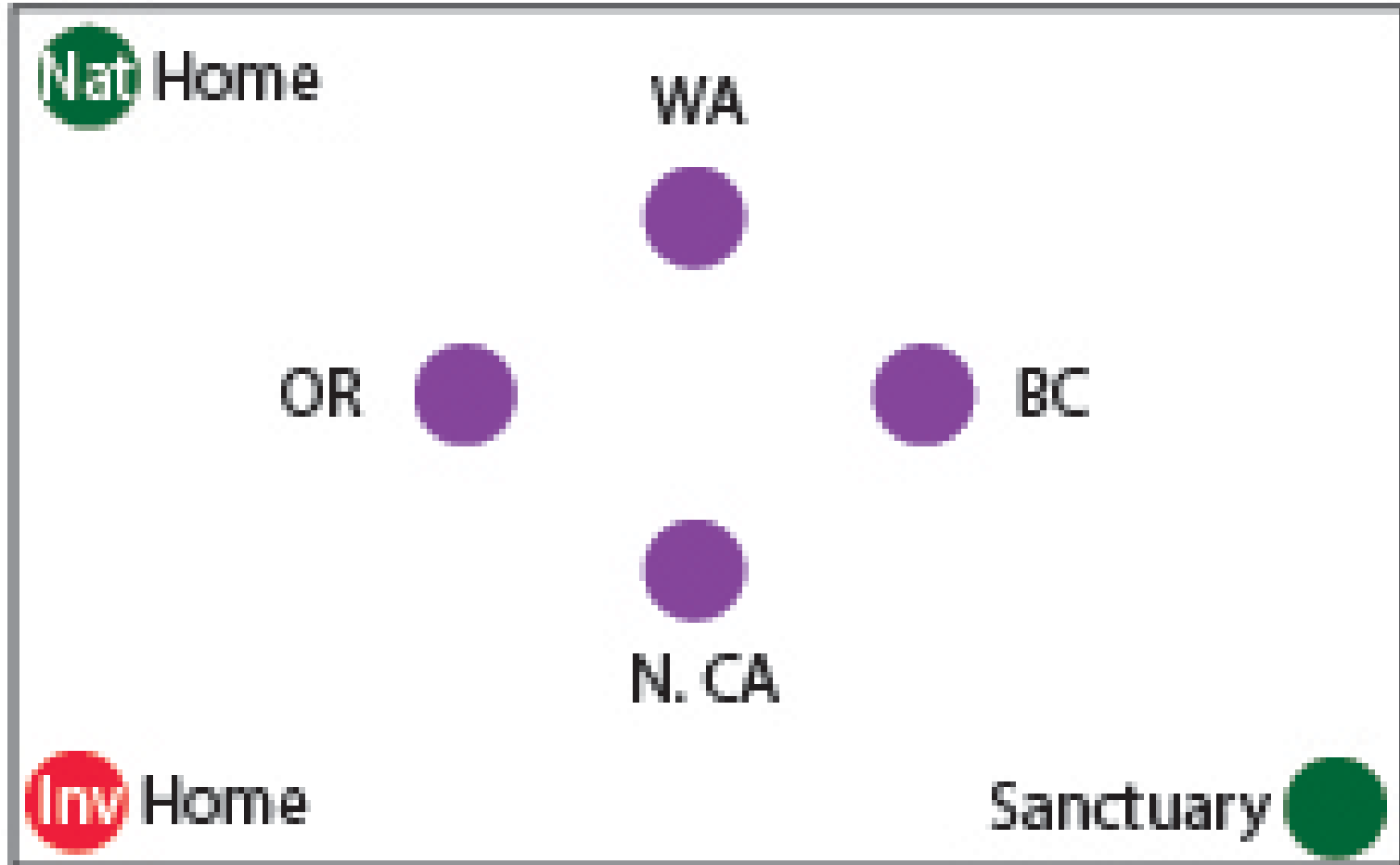
Habitat Invaded: Large rivers all over North America and San Francisco Bay.

Problems: Even though they are small they **reproduce** very quickly. Each clam has up to 2,000 babies a day and can have more than 100,000 in its lifetime. The babies only take 1 to 4 years to become adults. Because they grow so fast, they fight with native species for food and space. Electrical and **nuclear** power companies use water to cool their engines. They use pipes to bring the water in from rivers, streams and **reservoirs**. Asian clams are known as **biofoulers** because they grow inside the pipes and block the water. It has cost millions of dollars to get the clams out of the pipes. They can also block drinking water pipes.

Resources Stolen:

Space Food Money Health

Invasive vs. Native Role-Play Game



Invasive vs. Native Role-Playing Game

Invasive Species Team:

- **Ocean Vessel(s)**
- **Attaching Invasive Species**



- **Swimming Invasive Species**

Native Species Team:

- **Naturalist Boat(s)**
- **Attaching Native Species**
- **Swimming Native Species**



Resources

- **Space** – means room to live, grow and reproduce.
- **Food** – means having enough to eat and feed their children.
- **Money** – means not costing too much money to control (invasive take too much money to control).
- **Health** – means not being sick because of dirty water or disease.

Let's Play!

- Choose to participate in the games or watch.
- Can stay inside or go outside.
- I'll distribute game cards for you to share.
- Sorry they are not more complete.
- Any questions about getting set to play the games? We'll have a wrap up and then time for questions and comments.

Wrap Up

- What worked best for winning?
- What hurt the losing team?
- If this were a real ocean, what would have happened?
- Is that a good thing or bad thing?
- As a human, what do you think you could have done to help the native species?

Going Forward...

- Finish the cards & perfect the games.
- Test them with actual students and teachers
- Maybe do a crowdfunding campaign to make my concept a reality.
- Other games: Ocean Wars NE, SE, SW? Turf Wars, Air Wars?

Questions?

- Feedback?
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Thank you!!