

Jason St. Sauver produces *Alien Attack: Weeds in our Wetland*

Subsequent to the September 27 workshop, U.S. Fish and Wildlife Service Bear River Migratory Bird Refuge staff met with Kathy Stopher and the Box Elder County teacher workshop steering committee to design learning stations at the Refuge for the Spring 2012 student field trips. The teacher steering committee designed a 40-minute activity and Jason St. Sauver produced the lesson plan, *Wetland Wonders. Alien Attack: Weeds in our Wetlands.*



Jason St. Sauver give instructions how to play the quick game “Alien Attack: Weeds in our Wetlands”



Wetland Wonders

Alien Attack: Weeds in our Wetlands

Grade Level. Fourth Grade

Setting. Bear River Migratory Bird Refuge

Time Involved. 35-40 minutes

Key Vocabulary. weed, alien, native, non-native, invasive, steward (stewardship)

Utah 4th Grade Connections Science Core.

Standard 5: Students will understand the physical characteristics of Utah’s wetlands, forests, and deserts; and identify common organisms for each environment.

Objective 2: Describe and identify Utah native and non-native invasive plants and discuss the threats of invasive weeds to our wetland habitats. Use Activity for students to visualize this threat and add stewardship portion of removing invasive species from the area giving students opportunities to realize what they can do to help.

Summary: Wetland Wonders. Alien Attack: Weeds in our Wetlands

Students will learn to identify wetland plants and the difference between native and non-native/invasive examples. The students will also understand why invasive plants are a threat to Utah healthy wetlands and finish with a mission to help reduce this threat.

Objectives: Students will

- Identify at least 2 native wetland plant species
- Identify at least 3 invasive plant species
- Understand why invasive species are a threat to healthy wetlands
- Become a steward of stopping the spread of invasive species

Materials

- Outdoor playing area (preferably near a wetland)
- Sun/Water/Air (plant necessity) cards
- Invasive “Name Tags”
- Invasive species ID pictures
- Heavy duty garbage bags
- gloves

Background.

Invasive plant species are spreading nation-wide. Several species (*Phragmites*, cheatgrass, salt cedar) are threatening Utah wetlands and grasslands by outcompeting native species and providing poor habitat and water quality for Utah wildlife species and humans alike.

Warm Up / Intro.

Gather the students in a circle. They are now all plants living on the edges of a wetland – just like the cattails they can see growing on the wetland next to them. Review quickly why wetlands are so important – habitat (food, water, shelter, space) and helping to keep good water quality for wildlife AND us. Then, tell them, wetlands are under attack...from aliens! Alien Weeds! Explain to them that alien doesn't always mean an extraterrestrial, but can also mean anything that is not local and doesn't belong. Nuisance plants – weeds – from other areas or countries – are getting in to our wetlands and taking over. And not just plants – bullfrogs and carp here on the Refuge, too! What can you do? Identify, remove and don't spread!

Grab the plant ID cards or live specimens to demonstrate these alien attackers and the native plants that DO belong and define the following words:

Native: a plant that belongs here in Utah and provides good habitat for wildlife

Non-native or alien: a plant that doesn't belong. Perhaps it was brought over many years ago from Asia or Europe and planted for its beauty or for agriculture.

Invasive: a non-native plant that out-competes and takes over habitat from the native plants. Usually NOT good habitat for birds and other wildlife.

Show some examples! Native plants:

cattail – growing in wetland nearby, tall and grass-like with hot dog shaped seeds on top. Excellent nesting from birds and food for muskrats.

Bulrush - also growing in wetland nearby, tall and grass-like with rounded stem and small “trail mix” type seeds on the top. Also excellent nesting habitat and food for ducks and geese.

Invasive plants:

Phragmites (booo!) It doesn't belong in the U.S. Planted to stop erosion. This tall plant with feathery seeded top is also growing in the wetland nearby. It grows so tall and thick – and so fast – that the native cattails and bulrushes can't compete.

cheatgrass – grows so thick it covers the ground in some places in the west so nothing else can grow. It is poor habitat and food.



Activity. Time for the Game! (*teachers rehearsed the game on March 22*)

This quick game of ***Alien Attack: Weeds in our Wetlands*** will demonstrate visually just how plants like *Phragmites*, in a very short time, can take over a wetland. Every student is a NATIVE wetland plant like cattails and bulrushes. They are for the sake of the game – allowed to move and not be rooted in the ground. In the center of the circle are 25 plastic cards labeled AIR/SUN/WATER – the three things all plants must have to live.

Step 1. On the count of three, with NO shoving, each student plant will grab ONE and only one AIR/SUN/WATER card and then step back to the edge of the circle. Everyone survived! There are plenty of resources for each plant.

Step 2. Collect all the AIR/SUN/WATER cards (use a helper or two) and spread them back out in the middle of the circle.



Native plants need Air, Sun, and Water

Step 3. Choose 3 volunteers to become Invasive Alien Weeds! Take 3 of the *Phragmites* “name tags” and place them around the necks of the volunteers. Explain to all that these invasive plants start growing early – so they will get a 3 second head start. Also, these weeds try to out-compete our native plants so they can take 3 AIR/SUN/WATER cards while the native plant students can still take only 1. On the count of three, again with NO shoving, let the plants grab their necessities. You should end up with several students that do not get a card. Have all student plants that didn’t get a card put on a *Phragmites* “name tag.” Now the students will be able to see that *Phragmites* is spreading and some of our native plants won’t make it.

Step 4. Play one more instance of the game, just like before, but this time you know have many more Alien Weeds – each grabbing 3 cards. Again – many native plant students will not be able to get an AIR/SUN/WATER card and by the end of this instance – you should have over half of your “wetland” circle as *Phragmites* and very few cattails and bulrushes left...if any. Explain how this demonstrates how important it is to keep invasive plants out of our wetlands, refuges and backyards. Not only does it affect plants, but all the other animals that may need the native plants for food and shelter.

Stewardship and Wrap-up: Be a wetland hero!

For the final 5-10 minutes of the lesson, tell the students what they can do to help. Know your plants and be able to identify natives vs. invasives. Find the patch of already identified *Phragmites* or cheatgrass near the station. Hand out gloves and have students pull as much as they can – CAREFUL not to spread any seeds or plant parts. Finish by brushing off pants, shoes and boots and returning gloves – so no one spreads these plants to their own schools or backyards. (At the end of the day – the garbage bags will be shown to all students so they can see what a difference they made. And at the end of the year – before and after photos will be sent of the areas cleared of invasives to thank all the students for being *Wetland heros!*)

Literature Resources

Montana State Univ. Dept. of Land Resources and Environmental Sciences & Statewide Noxious Weed Awareness & Education Campaign, What’s In Your World?, 2007.

Classroom Extensions

Have students check their own schoolyard habitat for invasive plants – or use as a homework assignment to watch for invasive species in the students’ backyards and parks.

Classroom Assessment

Weed focus *Phragmites*, cheatgrass, dyer’s woad.



Teacher Workshop at the Refuge March 22, 2012

Thirty-five 4th-Grade teachers from Box Elder (32) and Cache (3) counties participated in the March 22 workshop at the Refuge. Teachers represented 14 Box Elder and 2 Cache county schools. The teacher lesson plans, *Alien Attack: Weeds in our Wetlands*, *Discovery Walk*, *Build A Watershed*, and *H2OhMy* were refined and teachers were trained at the actualized learning stations. Teachers took advantage of the opportunities to practice teaching at the learning stations in the manner they will teach their students during the Spring Refuge field trips.

Workshop Outcomes

- 35 Participants (32 Box Elder and 3 Cache county 4th Grade Teachers)
- 16 schools
- *“Wetland Wonders! Alien Attack: Weeds in our Wetlands”* lesson plan refinement
- Teachers learned and practiced 4 work station activities for Spring student field trips
 - *Alien Attack: Weeds in our Wetlands*
 - *Discovery Walk*
 - *Build A Watershed*
 - *H2OhMy*



Jason coordinated the agenda for a workshop to prepare teachers for the Spring field trips. The focus of the workshop is weed and macro-invertebrate education, and using the activity to teach both. Teachers worked through lunch finalizing their programs.

The workshop began with registration and refreshments at 8:30 a.m. Kathi Stopher provided a Project Status report and Katie McVey provided logistics for the day's activities.

Jason St. Sauver provided teacher handouts in a comprehensive-organized three-ring binder that represented the *Mountain Wilds, Wetland Wonders* Refuge program.



Carla Hoopes reviewed the invasive plant resource materials provided in September, making certain that new teachers received the same. She introduced the presenters: Joel Merritt, Cache County Weed Supervisor; Bill Gilson, Box Elder County Weed Supervisor; and Randy Berger, Utah Division of Wildlife Resources Wildlife Biologist and *Phragmites* Coordinator.

Invasive Plant Review: Joel Merritt, Bill Gilson, Randy Berger



Bill Gilson, Box Elder County



Joel Merritt, Cache County



Randy Berger, Utah DWR

Bill presented a shoe covered with cheatgrass and explained how cheatgrass was introduced and its relevance to fire and community economies. Bill finished his presentation by calling teachers to action to identify newly invading species like rush skeletonweed. Bill distributed Utah's Noxious Weed Field Guides to each teacher. Fourteen 2012 Utah Weed Calendars were also distributed to teachers. Eighteen additional Calendars were ordered and shipped by Castleland RC&D to the Refuge courtesy of Dow AgroSciences.

Joel presented dyer's woad education programs and discussed how teachers can engage with the community in programs such as *Bag of Woad*. Ideas were shared to engage students in weed board essay contests and a coloring book for the Refuge. Joel provided brochures on dyer's woad and outreach program guides for each teacher.

Randy presented Refuge and watershed *Phragmites* issues. He discussed various management strategies and prevention tactics to keep *Phragmites* from spreading. Jason provided clippings of *Phragmites* and cheatgrass plants from the Refuge. Carla provided dyer's woad and cheatgrass mounts for identification. Noxious weed and biological control pamphlets and books, NRCS weed fact sheets, and teacher resources filled the back tables. Jason and Carla facilitated a brainstorming discussion about community involvement and noted teacher interest in potential future engagements.

Potential Future Projects to Engage Students in the Community

- coloring book for the Refuge – including real specimens for identification
 - Joel has samples of a Utah weed coloring book
- county weed board essay contests
- connect with county (Box Elder and Cache) weed supervisors to engage kids
- Scout conservation projects on the Refuge
- Summer science clubs
- junior duck stamp

Jason St. Sauver teaches teachers how to teach *Alien Attack: Weeds in Our Wetlands*

Jason guided teachers onto the Refuge grounds to demonstrate how *Alien Attack: Weeds in Our Wetlands* game is played. Teachers became students as Jason worked them through the game rules and characteristics of native plants (bull rush and cattail) and invasive plants (cheatgrass and *Phragmites*). The game design demonstrates a plant's basic ecological needs: soil, sun, and water. Jason explained the game resources: laminated plant identification cards that identify native or invasive plant species. Teachers (or students) begin as native plants in a pristine setting with adequate soil, sun and water.



Native plants walk slowly and pick up one resource at a time: water, air, or soil

After the first round, invasive plants are introduced into the ecosystem.



Invasive plants move as fast as they can and pick up all the resources they can carry. Teachers learned the rules and had an opportunity to play the game. Jason coached a 4th-Grade teacher as she single-handedly taught the game, a valuable episodic experience before Spring field trips.



To make a point, Jason asked the teachers to round up all of the invasive plants (game players) which were formerly native plants (natives who did not survive became invasive plants to keep them in the game – no one gets left out). The tight grouping of invasive plants in the center of photo illustrates how quickly Phragmites or an invasive plant can grow and spread.

Katie McVey teaches stations: *Build a Watershed* and *Discovery Walk*

Following the working lunch when teachers worked through individual program issues and resources, teachers split into two groups. New teachers to macro-invertebrates had the opportunity to learn from Kathi Stopher in the learning center. Teachers who were comfortable with macro-invertebrates went with Katie McVey to the River Trailer ***Build a Watershed*** and ***Discovery Walk*** stations.

Wetland Wonders! H2OhMy



Kathi Stopher applied classroom resources and teaching methods to describe objectives, skill sets, tools, and the *H2OhMy!* lesson plan. Teachers learned how to teach their students to collect water samples and test turbidity. Once turbidity level is known, predictions can be made about macro-invertebrates that may be found. Teachers learned how to work with students to use a dichotomous key and identify wiggly things. Once the classroom portion was complete, teachers went with Kathi to the Refuge collection site with D-nets, buckets, tubs, temperature gauges, hand lens, flexible tweezers, and the dichotomous key. The station was set up as it will be set up for the student field trips in Spring. Teachers collected water samples, tested turbidity, selected wiggly things in their water for Petri dishes, and classified macro-invertebrates using the dichotomous key. Kathi covered safety precautions for Spring student field trips.



Logistics, safety and supervision issues were formalized and teachers returned to the learning center where teachers who had attended the other stations were completing wrap up and evaluations. Evaluations were 80% highly positive. Lessons learned will be used to improve future training. The workshop adjourned at 3:30 p.m.

Participants: Deborah Compton, Ethelann Clark, Vicky Litchford, Aumanie Bass, Alice Ball, Josselen Hull, Jan Rampton, Hailey Harper (for Susan Thompson), Shaylyn Ekins, Darl H. Frin, Cathy Wilkey, Kallie Rawlinson, Wendy Dunham, Jeremy P. Webb, Shea Sederholm, Mick Warburton, Barbara Davis, Kristina Brown, Rebecca Henrie, Aunstine Roybal, Verleen Hardman, Beth Stamey, Robin Bailey, Michael Pedersen, Gina Baird, Shauna Payne, Ashlee

Nelson, Jared Wright, Lester R. Talbot, Cindy A. Payne, Linda Cullimore, Christine L. L. Roybal, Rebecca Bowers, Nicole Cecil, David A. Gilbert, and Michael Rollins.

Spring field trips occurred April 10 to May 10 with 35 classes on the agenda. Carla attended the May 7, 2012 field trip to obtain video footage to document how the students respond to the teacher's program. Kathi and Katie coordinated obtaining permissions on the Service's "Agreement for Use of Likeness in Service Products" from teachers, and provided forms for their students/parents who were filmed on May 7.



Nine-hundred and forty-seven students were transported to the mountain wilds of Hardware Ranch in Fall 2011. Students returned to the Bear River refuge for wetland wonders learning stations in Spring 2012. The field trips success lies with 34 teachers who studied hard to learn about macro-invertebrates and invasive plant issues. Teachers developed ideas and activities for field trips, rehearsed them at a second workshop, and taught them in learning stations, which they designed. Refuge educators Katie McVey and Jason St. Sauver refined the teachers' designs and produced resources for the outdoor learning station activities. Refuge volunteers contributed to nature walks to identify native and non-native wildlife and plant populations. Local invasive species experts from county and state agencies delivered information resources and presentations to help teachers fully understand the issues on the Refuge and in the community.

Two workshops and two field trips were implemented on schedule and on budget. We accomplished more than we set out to accomplish, adding an additional workshop where teachers practiced the activities at the new learning stations on the Refuge. Teachers from 14 schools self-sufficiently ran the learning stations like experts on the field-trip days in April and May when 947 students migrated to the Refuge for a full day of science and service learning.

The two-workshop and two-field trip approach provided a fun and engaging experience for teachers and students. The project activities met teacher goals to provide opportunities for their students to be a catalyst for change. Teacher response indicated a valuable experience, one they want to continue and expand on in the next year's workshops pending funding. The teachers' hopes are to add to *Mountain Wilds, Wetland Wonders* a climate change research project design in which students collect and analyze data of wildlife and plant populations from year to year, class by class.