

## Human Impact on the Environment: Ancient and Modern

by Sabrina Carlson

The 5th and 6th grade class of Mrs. Chapman and Mr. Ross at Flagstaff Junior academy had been studying the ways humans have altered the natural world, either accidentally or with the intention to “control nature,” from ancient times until now. They have also been learning about the role of plants in an ecosystem. This was a perfect time to learn about invasive weeds! How they get here, how they spread, and what to do about them!



*Our First Bag of Weeds!*

On September 28, I made a classroom visit for a preparatory lesson. After a conversation about what makes a weed invasive (instead of merely non-native), how invasives spread, and looking at pictures of a few common weeds that we might see in northern Arizona, we headed outside to play a game in which the students got to act out the roles of native and invasive plants on a large playing field “game board.”

Armed with their newfound knowledge of invasive species the 45 students of this vibrant class headed out on the Arizona Trail’s Passage 32 from Elden Pueblo and headed north. After 1 1/2-mile of hiking the students noticed that we weren’t seeing very many invasives next to the trail. They hypothesized that lots of AZT hikers must know to pull up these noxious weeds! We divided up into four groups, each lead by an adult, to wander away from the main trail for a hundred yards or so. We quickly found dalmation toad flax, mullein, and quinopodium enough to fill 10 large garbage bags with weeds!

My group had a lively discussion about what to do with the mullein. The scientists call it an invasive. But the Dine’ (Navajo) people consider it sacred and ceremonial. After sharing their ideas, our group voted to only pull half of the mullein we found. That way, they reasoned, we would leave some for the people who will use it but we won’t let the population get too big.

As we worked pulling weeds, there was one small plant they kept finding. They all wanted to know what it was. I didn’t recognize it as a weed so we left it where it was. Later as we were doing a silent observational drawing, one of the students made a discovery! He noticed, through careful observation, that the leaf shape, placement and color was exactly the same as a lovely native wildflower we had been admiring all day! It was a scarlet gilia that hadn’t bloomed yet. Scientific observation for the win! All of the students were excited and the young man who had made the discovery was very proud of his efforts.

We were able to tie all of our invasive weed work back to how humans have impacted our environment, as we are frequently the reason species end up where they shouldn’t be in the first place. Sometimes on accident, and sometimes because we are trying to do something good...but it backfires.



*Scientific Leaf Drawing*

After lunch we took turns hefting the heavy bags of weeds back to the trailhead. Two docents from the Elden Pueblo Ruin were waiting for us. After speaking with the program designers for Elden Pueblo about what we were studying, they happily offered to create an entirely customized program for our group.

The docents showed the students the old road bed that used to serve as the only route into Flagstaff. Even though it has been decommissioned since 1924, very little vegetation recovery has occurred. They shared ideas about why this might be; from the soil being too hard and damaged, to their suspicion that some people might still use the road for wood cutting even though it is closed.

We then moved on to see two sections of forest. One was heavily overgrown with scraggly trees suffering from a dwarf mistletoe infection. Forests this badly overgrown are the direct result of the human fire suppression efforts of Flagstaff's early settlement days. We then visited a healthy section of forest with lots of space between trees, grass in the understory, and more than one species of native tree present. This area had been burned heavily by the Side Fire about 12 years ago and has since recovered beautifully. We were able to discuss fire policy, how past policy impacts current fire danger, and even snuck in a little mental math!

See if you can solve this equation: If the natural fire frequency is 2-5 years but a fire suppressed are only sees fire every 10-12 years, about how many healthy fires has a "managed" forest missed after 200 years?

This was truly a delightful and action packed day filled with lots of learning both planned and spontaneous! Plus, we now have 45 new trail users who can spot and remove common noxious weeds!



*Feeling Accomplished!*

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