

Post 8 – Water Quality

The water quality of the river may appear to be bad, but looks can be deceiving. After 10 years of testing, we conclude that the river at this location has good water quality. Several times throughout the school year we test for phosphates and nitrates (possible pollutions), temperature, dissolved oxygen, pH and turbidity. Erosion at the river is a concern and causes an increase in turbidity (or the lack of clarity of the water). Please see our data table and graphs on the trail sign. As you look around you can see diversity of organisms living both in and out of the water. This is a sign that this is quality habitat, especially because some “water bugs”, invertebrates, such as mayflies will only live in healthy water. They are called indicator species.

Post 9 – Geology and Fossils

As you look around you see sagebrush and desert plants. What you may not know is the region used to be completely covered with water. The mountain peaks behind you were little islands. Then the water froze during the ice age. It eventually dried up thousands of years ago. If you observe closely while touring the area you will find traces of ancient life, such as possible fossils of Ichthyosaurs, *Shonisaurus popular* which is a big fish lizard! The biggest fish lizard found around here was 26 feet long! There also were Giant Sloths in the area. For example, in 1882, a Giant Sloth fossil was found that stood 6 feet tall. During mining, small mammals similar to the modern squirrel were also found. If you're able to glimpse the ancient rock, you might be able to see the layers from the past.

Post 10 – Historical Road

Several yards ahead on the trail lay the remnants of an unknown historical road built

by either pioneers or farmers before 1870. It follows the river, so it would have given the travelers access to water and good hunting. We know that it was claimed by Jose Romero and George Zelmets in the early 1800s. No taxes were ever paid so it became state property in 1870. State archives records show that the road was never mapped, so it wasn't built by the railroad or the state. This road is now overgrown and partially eroded, but it's easy to see that wagons once rolled along these rocky banks.

Post 11 – Mining Pollution

It's a nasty legacy of Nevada's rich mining history: Mercury can be found in the bottom sediments in some areas of the river. There is no mercury at this location, because the mills were all downstream, starting at Empire City, about a mile from here. A 50 mile stretch from the Comstock foothills to the Stillwater Wildlife Refuge was declared a Superfund site by the EPA in 1990. Since then, the agency has spent more than 8 million dollars in research and cleanup. During the Comstock mining era, elementary mercury was used to separate gold and silver from the ore. 7,500 tons of mercury, mostly imported from California is believed to have been left behind. The river is still safe to swim in. The trout are also safe to eat, because they are stocked every year and do not live through the warm months. Also, the trout have not had enough time to accumulate mercury. Fish and other animals can build up mercury in their bodies through a process called biological magnification. Mercury moves up through the food chain, which started deep in the mud. Most scientists believe the native fish are also safe to eat, unless you eat several every week.

Post # 12 - Desert

At this post one can have a view of Nevada's desert ecosystem. You will notice a large amount of shrubs like: sagebrush, black brush, shad scale, Mormon-tea and greasewood. These are just some of the plants that have adapted to the high desert climate of Nevada. In a high desert the temperatures range from freezing in the winter and hot dry in the summer. Nevada is part of the Great Basin desert, which is a large valley with a series of mountainous ranges that run vertically across the state. From this post to the west of the river you will have a breathtaking view of the Sierra Nevada Mountains. Also, if you look north down the river you will see desert hills.

Thank you for traveling the CHS Biology Trail! We hope you have enjoyed the experience. We ask that you “tread lightly”, stay on main trails, take what you brought and even some extra trash. We would like to thank the following people for their support in making this trail a success: Mark Kimbrough, Jeremiah Heidert and Boy Scout troop #16, SignPro, Mr. Perry (EVMs), CC Parks & Recreation and State Archives. Furthermore, we thank Caitlin Cosens and Mr. Lopategui's Graphic design class for our Logo. For more information or comments please call Ms. Koop, biology teacher at Carson High School, 283-1930. 4/2012

CHS Biology Trail
“Biology at the River”



CHS Biology Trail

Interpretive Trail Guide

*Designed, Built and Written by
Carson High School Biology
Students, with the help of
Boy Scout Troop #16*

Welcome to the Ambrose Interpretive Trail! **The trail starts southwest of the sign, head toward the river and veer to the left before going down into the oxbow. Please stay on the marked path and be aware of the critters, especially Rattlesnakes.** There are many birds, animals and plants found in the rich and diverse environment here at the Carson River. This trail was designed to give our citizens and tourists access to this beautiful ecosystem while still protecting and preserving those who live here. While traversing the trail you will stumble upon evidence of wildlife such as animal tracks, feces, bird calls and nests. So, **begin your adventure and enjoy!**

Post#1 - Riparian and Oxbow

You are venturing in riparian habitat. Riparian is defined as an ecological landscape that is generally associated with rivers, streams, ponds and lakes. They are vital areas to wildlife. To the left and beyond the vegetation, there is an oxbow and a rocky beach on the Carson River. An oxbow is a landform that is created when a river divides and meets up again downstream. Oxbows can change over time due to drought and flooding.

Post#2 - Birds

Sitting by the banks of the river is like walking through a music box store; there are so many different bird calls going on that it's hard to know where to start. Maybe you can't even hear any birds, so let's start with that: *how to bird watch*. Most importantly, BE QUIET. You don't want to scare away any of these beautiful, yet skittish birds. Approach a comfortable observation area; use your ears to enjoy the sounds, and your eyes to scan the area for

any birds taking flight from the tops of trees, or slight movements by the base of the rivers. Many small birds camouflage there easily so they can scrounge for food, but not be food themselves. It's a good thing geese are so big and not as easily made prey; it's hard to miss this oversized, strange sounding bird. Killdeer are also common on the shore line. You may also see Nevada's state bird, the mountain blue bird, perched on the very tops of trees.

Post#3 - Botany

Botany is the study of all plants in general, but let's take a closer look. In our area, Red willows, Fremont cottonwoods, sagebrush, and rabbit brush are common plants. Facing the Carson River, you will see bushes, these are willows. Willows are found on the banks of the river. These are the red stemmed plants that seem to create a red border along the river. Depending on what time of year you are visiting the area, you may see many small puffs of cotton floating in the air and on the water. These seeds (made from pollen & an egg) come from the blossoming cotton wood trees. These trees are hard to miss with their wide trunks and tall branches. Probably the most common (and most annoying if you have allergies) plants in Nevada are sagebrush, the state flower, and rabbit brush. Just because they both end in "brush" doesn't mean they're the same plant. A few of the many differences between the two plants are sagebrush has small, silvery white, wedge shaped leaves, and rabbit brush has hairy white branches with yellow flowers. Despite the many plants and their beauty, there is an invasive plant problem in this area of the river. If you look around, you can see these noxious plants, Hoary Cress, Tall White Top and various thistles. Invasive

plants are not from our country, they usually come here from Eurasia. They out compete the native plants because they do well in our climate and they do not have any predators here.

Post #4 – Hydrology

Hydrology is the study of water. The Carson River runs 184 miles from Alpine County, California to the Carson Sink in Churchill County. The river is made up of an East and West Fork. The river is unique because it never reaches an ocean, but evaporates on farms and wetlands. The annual water flow ranges between 100-500 cubic feet per second (cfs). The flood of 1997, which is considered a 100-200 year flood, had a peak flow crest at 15.36 feet. It overflowed its banks and made its way onto the golf course across the river. The flood caused substantial damages to homes, businesses and agriculture.

Post #5 – Respect

Respect is one of the most important things to keep in mind when you are at the Carson River. You need to remember that you are in wildlife territory and you need to respect the organisms that live here. You can respect the animals and their homes by using trash cans located up by the parking lot, staying on marked trails and watching where you walk. When you and/or your pets do not stay on the main trail, it can lead to erosion which can destroy animals' homes or go into the river.

Post #6 – Wildlife

At this post one can view many different kinds of wildlife. To the north of this post is the river, and you may often see Canada geese, beavers and fish. The hills to the east are home to mule deer, wild horses, coyotes, and several types of rabbits; such as,

cottontail, snowshoe, and jackrabbits. Living in the trees surrounding the river are red tail hawks, owls, magpies, robins and woodpeckers. There are many signs of evidence to look for at this post and as you walk the trail. For instance, there are many large nests to be found in nearby trees. By looking around, you can look for the magpies that inhabit many of the nests. Also, there are animal tracks and scat to be found everywhere on the trail.

Post #7 – Beavers and Bats

Many beavers live in the river. They have made major changes to this habitat. The wire mesh around the cottonwood trees are there so the beavers do not destroy all of them. Although you can rarely see the beavers, there is evidence that they are here. There are many dams along the river, where the beavers have tried to flood the habitat around them. Beavers are most active in the spring and summer seasons. If you're lucky you can see the beavers adding to their dams with new sticks, branches or logs. You can also see remains of old bat boxes; we plan to replace them next year. Bats are an important piece of this ecosystem.