P Fish
H
S Hatchery

Project Overview

The agriculture and economy of the Grand Valley rely heavily on the Colorado River, as do the organisms that inhabit it. However, as drought worsens in the Grand Valley, both of these entities are threatened. The PHS Fish Hatchery project hopes to provide a solution to these issues. This project aims to establish a fish hatchery on the school grounds that supports the endangered fish of the Colorado River. This project will start by supporting the Razorback Sucker, which is an endangered fresh water sucker fish found in rivers and lakes in the southwestern United States and has inhabited the Colorado River for the last 4 million years. By aiding the endangered fish populations, water use in the Grand Valley, as we currently enjoy it, will continue to be protected under the Endangered Species Act. This is very important for food production and the overall local economy. In short, as the populations of endangered species of fish increase in the Colorado River, the more water that will be able to be diverted for the purposes of irrigating the agricultural land that is a strong base of the economy of the Grand Valley and the upper Colorado River Basin. The fact that stretch of the Colorado River that runs through the DeBeque Canyon and the town of Palisade is an important breeding ground for a large number of the endangered species that call the Colorado River their home, allows for ample water to flow and not be diverted by entities up river from these areas. In addition to the economic and environmental benefits, this project will also provide students with learning opportunities and hands on experience with maintaining the fry. Overall the PHS Fish Hatchery is an incredible opportunity to help the community and will benefit the environment during this critical 15-year drought.

[Image of a Razorback Sucker]

Hatchery Facility

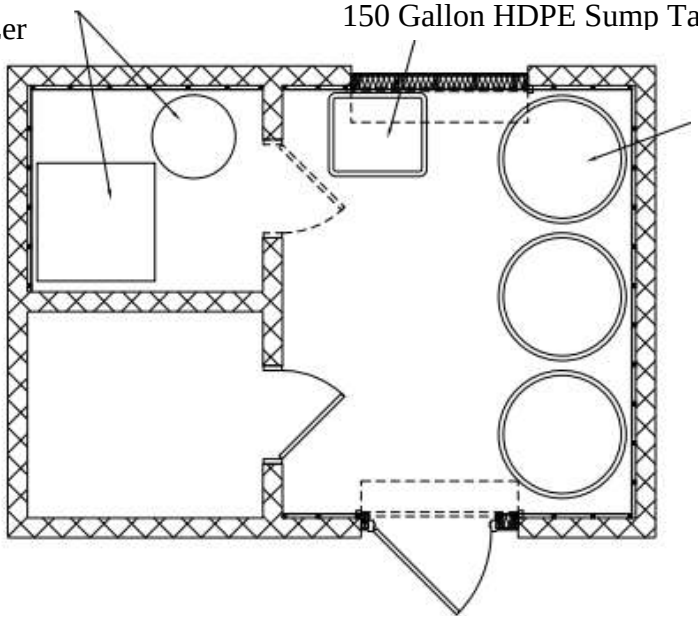
The US Fish & Wildlife Service will provide the hatchery fish tanks, the filtration system, the fish, fish feed and feeding systems, and any other components that are needed for the tank system. Palisade High School will provide a building to house the fish tanks, as well as students to work the fully equipped high school campus hatchery. There is already a building present that will be modified to accommodate the fry. The experience would be from fry to early adult-hood, then release into the Colorado River, which is directly behind Palisade High School.

Hatchery Needs:

- Keyed entry door/security door/well insulated
- Fire alarm
- Heating and cooling device to maintain 70^{o} F
- Insulation, walls & ceiling
- Dehumidifier
- Year round water supply
- State inspection on electrical & plumbing

[The current storage building that will be converted for the project]

Integrated Filtration System including dual filter bag, low head pump, air compressor, and sterilizer



[Floorplan with filtration and tanks]

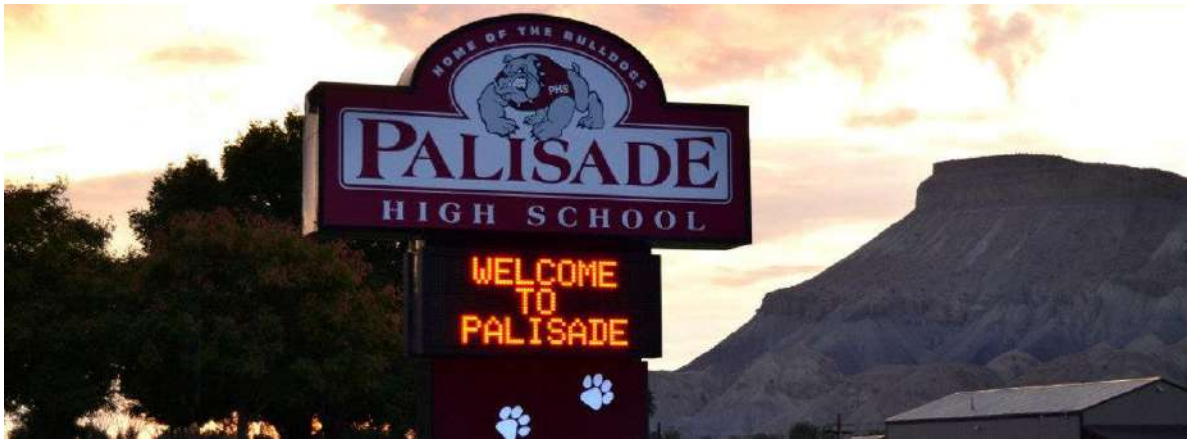
Benefits

Palisade High School students who take classes that interact with the PHS Fish Hatchery project would receive high school academic credit in classes such as River Dynamics, Chemistry, Biology, Environmental Science, Math and Literacy to name a few. The educational benefits would be far reaching and would allow our graduates a unique way to stand out on the pathway to college. We also see this as a facility that could bring students from Taylor Elementary, Mt. Garfield Middle School and other schools around Western Colorado to visit and learn about the important niche that these endangered species provide in our delicate desert ecosystem. Perhaps these visiting schools would be inspired to construct an indoor fish hatchery of the same caliber and impact even more students that live in the midst of the Colorado River.

As a farming community, Palisade would benefit from this project. Palisade is well known for raising all types of fruits and vegetables with apple, cherry, peach, pear and plum trees being planted as early as the 1890's. The agriculture in Palisade is successful due to the unique climate and the presence of the Colorado River, which provides irrigation water to the farmlands. Therefore, supporting the endangered fish of the Colorado River through the PHS Fish Hatchery project allows Palisade more access to this critical irrigation water, supporting the community as a whole.

The Department of Fish and Wildlife will benefit from having an ongoing method for raising endangered fish that can cause water resources to be restricted when fish habitats are threatened. This is a key reason why the U.S. Fish and Wildlife Service is willing to provide PHS Fish Hatchery with help and materials.

The PHS Hatchery experience will also provide our Colorado community with a source of pride as we create a trailblazing opportunity. Our example of cooperation across lines of boundaries such as our local school district, water boards, and government entities could set an important example to benefit other communities looking to create change.



Costs

We have a building on campus that we can convert to be used for the hatchery. We have school district approval to do this conversion. What we are trying to do now is raise funds for the building conversion. Although it won't be a traditional classroom, we have to meet fire safety requirements for a student learning room. The building will be more like a science lab but it still has to be brought up to current fire code and HVAC standards.

We have an original bid of $82,910 from PNCI Construction for the cost of the building conversion. Recently, a District #51 electrician, Brian Scherping, worked through the summer to create a bid that was much more affordable. His bid came in at $25,000. This bid includes the use of PHS construction tech students to help with the building upgrades. Currently, we have nearly $75,000 of "in kind" donations towards the project. This includes the building that already exists, the work by numerous people that has been put in to get this project off the ground and the commitment of the USFWS to purchase the aquaculture system that will house the fish. In short, we are looking for funding. We have community to support to help with many aspects of the minor details of the conversion but are hoping to find a grant or donation to help with the larger part of the expense of this innovate and widely beneficial PHS Fish Hatchery project.

Three of our PHS Seniors have raised $1500 by selling peaches and donating scholarship award money earned, to help find funding for this project and are hoping to raise more. The PHS Fish Hatchery is easy to support once people understand how beneficial the project truly is. We are hoping you might help direct us toward some ideas for funding.

[Isabelle Haderlie and Kaleb Hawkins selling peaches at PHS back to school registration]

Team Members

Patrick Steele – PHS Science Teacher / Project Director

(patrick.steele@d51schools.org) (Cell: 970-361-5415)

Dan Bollinger – PHS Principal

(daniel.bollinger@d51schools.org)

Mike Gross – USFSW Fish Culturist & hatchery liaison

(michael_gross@fws.gov)

Isabelle Haderlie – PHS Graduate member

Kaleb Hawkins – PHS Graduate member

Levi Van Pelt – PHS Student member

James Soria – PHS Student member

Dyllon Hoaglund – PHS Student member

Brian Scherping – D51 Master Electrician / Hatchery Project Supervisor

(brian.scherping@d51schools.org)

Laurie Haderlie – PHS Parent / Hatchery Project Advisor

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David Miller – PHS Parent / Hatchery Project Advisor

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PHS Fish Hatchery Academic Profile and Plan

In the last couple of years, School District #51 and Palisade High School have adopted a new learning model frequently referred to as Performance Based Learning. In that model, now known as the Middle Years Programme (MYP) at PHS, teachers focus not only on content knowledge, but also on concepts, local and global issues, and interdisciplinary connections. This approach to teaching and learning also stresses the importance of students taking ownership for their learning and developing problem-solving skills through creativity and collaboration. Because the International Baccalaureate's Middle Years Programme is encourages students to make practical connections between their studies and the real world, PHS aims to give students many opportunities to better understand and share in their responsibility for their community. We believe that students learn best when their learning experiences have context and connections to their lives and their world.

We see the use of the PHS Fish Hatchery as an academic tool that will have a profound effect on the education of our students in the following ways:

- The development of students' social, thinking, research, communication and self-management skills, they grow into more self-directed and confident learners, able to apply their academic knowledge and skills in unfamiliar contexts
- The hatchery project helps the PHS learning community stand behind mottos like, "Education for a better world" and "Think Globally, Act Locally"
- The use of aquaculture systems in the classroom is innately interdisciplinary; not only with a variety of disciplines in science and math, but throughout all school subjects.
- Examples of the direct use of the hatchery as a learning tool by specific disciplines:
    - Science – data analysis, life cycle of fish, engineering of aquaculture systems, scientific method in problem solving, water quality, habitat education, the river as an ecosystem
    - Math – data analysis, probability and statistics, number sense, measurement, mathematical patterns
    - English – scientific writing, persuasive writing, creative writing, poetry
    - Social Studies – GIS mapping (Geographical Information Systems), social implications of healthy ecosystems, upper and lower Colorado River Basin fish distribution maps
    - Business & Economics – economic implications of fish recovery programs, financial gains of indoor aquaculture food systems,
    - Construction Education – apprenticeship type learning during the construction upgrades and construction experience with the building of a storage shed
    - Art – creative fish art, scientific sketching, visual promotion of endangered fish
    - Career internship – work through non-school days as a fish culturist and hatchery manager

In Kind Donations

Project: Palisade Observatory Remodel for Fish Hatchery

Address: Palisade High School 3679 G Road Palisade, CO 81526

Date: 11/25/2018

Estimator: Patrick Steele

Project Duration: N/A

Company	Description		Total:
School District #51	Outdoor Classroom Storage Building		$60,000.00
U.S. Fish & Wildlife Service	Aquaculture System		$7,600.00
U.S. Fish & Wildlife Service	Aquaculture system set-up labor, work going into hatchery project		$1,200.00
School District #51	Time Committed & Work done on Hatchery Project		$2,500.00
Palisade High School Students	internal framing for building upgrades, building of utility shed, apprentices of Brian Scherping		$2,000.00
GS Robson - Architecture Inc.	hatchery building upgrade blue prints		$1,500.00
		Total:	$74,800.00

2018 - 2019

Construction Bid

Project: Palisade Observatory Remodel for Fish Hatchery
Address: Palisade High School
3679 G Road Palisade, CO 81526

Date: 8/24/2018
Estimator: Brian Scherpping
Project Duration: 2.5 - 3 months

Company	Description	Total
Builders First Source	construction materials for building remodel	$3,186.00
SMG Electrical Services	electrical line & panel materials and labor	$8,781.00
Comfort Air	HVAC system installation and materials	$5,400.00
Wapiti Plumbing & Heating	labor and materials for aquaculture system hook-up	$1,760.00
Palisade High School	utility shed, unforeseen construction costs, maintenance fund	$5,873.00
	Total:	$25,000.00