

2025

Phenology Calendar

*Artwork And Writing by Owl
Class of 2029*



Foreword

Every year students at OWL explore the community around them through our Fall Fieldwork program. Each grade is tasked with digging deeper into one of the many questions that can help to drive and motivate students' curiosity towards their impact on the environment around themselves. For the seventh graders this question is "What makes a community thrive or suffer?" Throughout the year the students investigate this question through a multidisciplinary adventure that follows them through art and science!

In the fall, students spent a night at Osprey Wilds Environmental Learning Center where they learned about the many different plant and animal species that thrive in our state. The students also learned about the systems that maintain the sensitive equilibrium between abiotic and biotic factors. At Belwin Conservancy students continued to explore these systems deeper by exploring the Minnesota prairies, deciduous forests, and coniferous forests equipped with thermometers, photometers, anemometers, sketchbooks, and their curious minds! All of this to discover what makes ecological communities thrive or suffer.

When they returned to OWL, the students in Kent Miller's art class learned how to create scientific drawings of animals where students chose a specific Minnesota species to illustrate and created amazing works included in this calendar!

Back in science class students worked together to research the impact on the seasonal activities, or phenology, of their species. In the end the students synthesized their learning by writing about the impact of climate change on their species' phenology.

This calendar is a showcase of the students' knowledge of the impact of climate change on their local ecological communities that they discovered through outdoor exploration, artistic interpretation, scientific research, and writing.

I feel so grateful to have adopted this amazing project from Megan Hall, and I think the students did a stellar job, both in their work in Kent's art class as well as the research they did in mine.

Akira Mally
7th grade Science Teacher



A Word from Kent Miller (Art Teacher at OWL) on his Experience Teaching the Minnesota Species Project



[To start this project] we practiced [the look, holddraw method] a few times with our observational sketchbooks and then that allowed the students to have a baseline of skill to draw with accuracy the species of choice.

The main revision process was time. I gave an extreme amount of class time for students to create their drawing. How can time be a revision technique? Well, it is all about creating the mood or tone in the classroom with the students. It is important to give students the space to create and feel unencumbered by external factors, like time. As a teacher I had to trade getting through more content with doing this project with quality. So it was not a specific revision process but rather it was the space for a student to see that they wanted improvements done on the project they were creating and had the space, time, to do it.

I chose to offer different types of mediums as a way to allow for the student to feel more comfortable with their own creating process. Giving the student space to make their own choices about what medium is a way to get students creating at their highest level. When students have the autonomy to make their own choices and it directly influences their own project it increases the quality of the art project. I have seen that numerous times in my teaching career. When I have specific requirements it often reduces student creativity and increases a technical experience in visual art.

When it all comes down to it, as an art teacher I am often trading one aspect of the project for another. Like a little slider bar, when I increase freedom over here it automatically decreases something else. I just have to be aware of what things are being traded for and be okay with it. Like in the case of the MN Species Project I traded quality of project and time.

I am so very excited about the results of the MN Species Art Project and very proud of the work that students put into it.

Special Thanks to..

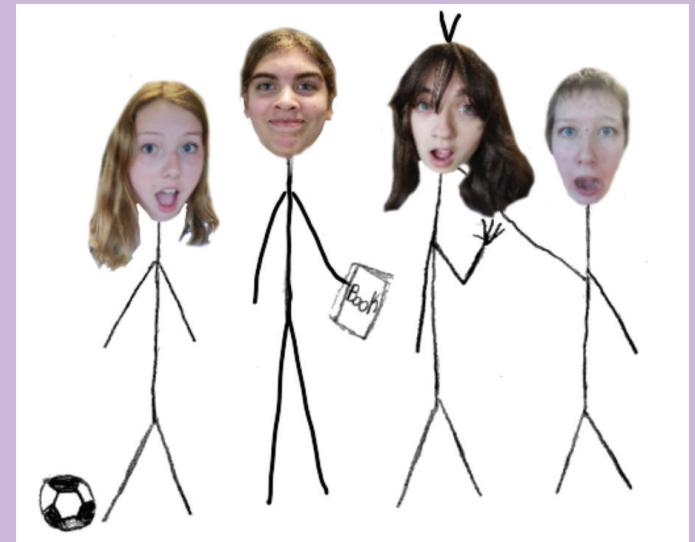
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Publication Team

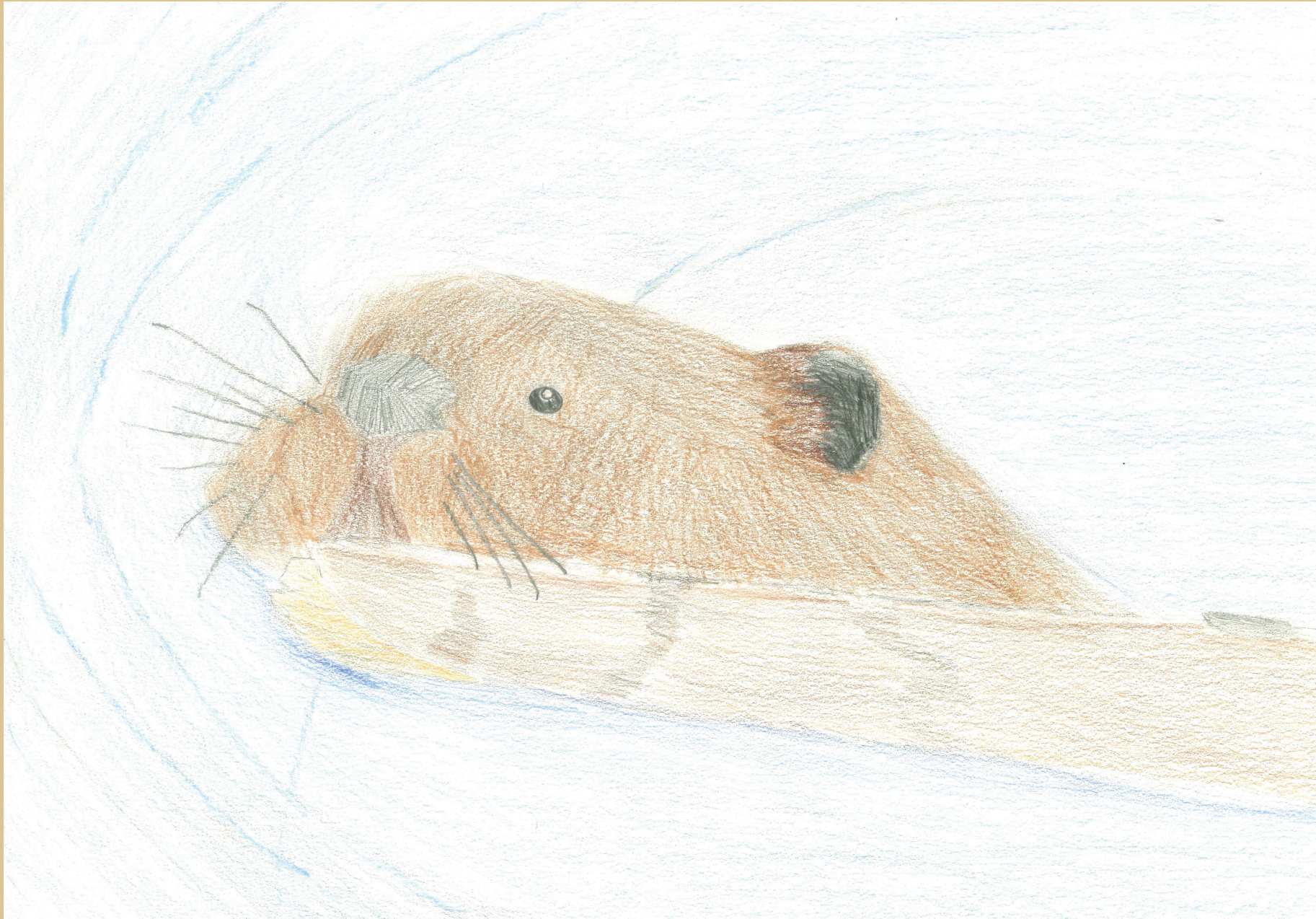
Luci Hulson



Bald Eagle
Chloe Annis-Bercier

JANUARY

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Beaver
Luca LaFerla

FEBRUARY

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Cecropia Moth
Atlas Schultz

MARCH

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Chipmunk
Lily Koering

APRIL

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Gray-Headed Cone Flower
Vivian Spende

MAY

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Whitelined Sphinx Hummingbird Moth
Luisa Schmidt

JUNE

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Trumpeter Swan
Ehna Sommerville

JULY

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Flying Squirrel
Henry Helle-Morrissey

AUGUST

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Pileated Woodpecker
Hannah Loomis

SEPTEMBER

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Silver Haired Bat
Penny Lloyd

OCTOBER

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Ruffed Grouse
Asa Hannert-Dawson

NOVEMBER

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Northern Cardinal
Clare Exley

DECEMBER

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Eagles
Haliaeetus leucocephalus
Chloe Annis-Bercer and Will Scott

Eagles are important signals of a healthy environment. As top predators, eagles help maintain balance in ecosystems. Their presence signals that an area has clean air and water. Protecting eagles and their habitat is very important for climate change. Eagles habitats are being destroyed by climate change due to a rise in temperature. But not just their habitat, but also food sources and their chances of survival. Changes in weather and temperature can affect the availability of their prey. It's harder for eagles to find food. Rising sea levels and weather events can also cause damage or destroy nesting sites. Therefore, in the future the population of eagles might decrease due to climate change.

Beaver
Castor
Luca Laferla and Alex Miller

Beavers aren't in danger from climate change at all, as they can live in all sorts of temperatures and their main source of danger being predators and hunting. Beavers are actually one of the few animals that help with climate change. As they build dams, they create ponds and widen rivers. Beavers dams deepens the streams where the deeper you go, the colder the water gets, basically cooling the water which helps a large amount of animals. It's proven in a recent study that beavers dams cooled streams by more than 4 degrees Fahrenheit. It's not just temperature that beavers help with. By flooding areas with dams, beavers can wet the soil which helps a lot with wildfires to protect plants and stop the fire from spreading. In conclusion, beavers aren't directly affected by climate change very much, but they do actually help other animals survive during heat waves and hot temperatures, and even make a difference in global climate change.

Cecropia Moth
Hyalophora cecropia
Atlas Schultz and Leo Cheney

Cecropia moths are indirectly affected by climate change. The timing of the seasons as well as when plants begin to grow leaves has shifted because of changing temperatures. This makes it difficult for Cecropia moth caterpillars to find food, therefore depleting their population. Another danger they face is habitat loss, which is also connected to climate change. In conclusion, Cecropia moths are under threat from habitat and food loss caused by global warming and climate change.

**Chipmunk
Tamias**

Lily Koering and Talulah Karl

Climate change has a negative impact on chipmunks, especially alpine chipmunks. The alpine chipmunk lives in cold places, but now they're moving up the mountains. Eventually, they will have no place to live because it's too warm. All chipmunks hibernate and if it gets too warm, then they won't be able to hibernate. Now, they are even losing genetic diversity, which could lead to extinction. At the moment, they seem to be doing fine, but research shows that in the near future they will be facing new risks.

**Gray-headed Coneflower
Ratibida pinnata**

Vivian Spende and Misk Sewidan

The gray-headed coneflower are a species of wildflower native to central & Eastern North American territories. Although not federally listed as an endangered species, they are still threatened by climate change. They are usually grown on highways and spaces that are prone to wildfires. These climates provide a dangerous environment for the flowers and have been slowly decreasing their growth rates.

**Hummingbird Moth
Macroglossum stellatarum**

Luisa Schmidt and Abby Street

The white-lined sphinx hummingbird moth is being affected by climate change, though because of their ability to switch quickly between food sources, they are not being too heavily impacted. However, in the future, the warming climate may cause the moth's migration patterns to change, bringing them out of some areas and into others, damaging the local ecosystem. Warmer temperatures also change the timing of plants flowering, making them out of synch with the moth's life cycle. These plants also depend on hummingbird moths (along with other insects), to pollinate them. With all these impacts, white-lined sphinx moths might soon be declining, or moving to other areas, negatively affecting many ecosystems.

Trumpeter Swan
Cygnus buccinator

Ehna Sommerville and Edison Kozlowski

The Trumpeter swan could be negatively affected by climate change, as they are considered to be a moderately vulnerable species. The Trumpeter swan will be heavily affected if the temperature keeps warming at the rate it is currently. Shallow wetlands are essential to Trumpeter swan nesting but they are drying up. The Trumpeter swan was already an endangered species, so with their nesting area drying up it could be very bad for their species. As temperatures are rising, swans habitats are drying, leading to fewer Trumpeter swans.

Flying Squirrels
Pteromyini

Henry Helle-Morrissey, Nico Gonzalez, and Si Dee Paw

Climate change is affecting flying squirrels negatively. In North America, the southern flying squirrel habitat has moved up north as a result of climate change warming the area. Also, flying squirrels' hibernation patterns are getting thrown off because of climate change, and females are leaving their burrows earlier and earlier each spring. Wildfires are also a big problem, because with the warming climate, wildfires are becoming much more frequent and much more dangerous. Wildfires are the biggest threat to flying squirrels because it destroys their habitat, the coniferous forest.

Pileated Woodpecker
Dryocopus pileatus

Hannah Loomis, Aeris Hendricks, and Jasper Balian

Climate change is threatening Pileated Woodpeckers' habitats. Pileated Woodpecker's habitats include woodlands and forests. They rely on trees for food and homes, spending most of their days clinging to trees. They have made adaptations for their arboreal lifestyles and are now mostly dependent on their habitat. Unfortunately, with the rise of climate change, these habitats are predicted to take a turn for the worst, with a decline in trees, increase in forest fires and forest mortality events. As climate change gets more severe, Pileated Woodpeckers are losing their homes. Since woodpeckers have an important role in pest control, this will lead to not only less woodpeckers in Minnesota, but also more insects.

Silver haired bat
Lasionycteris noctivagans
Penny Lloyd and Jacob Allen

Climate change is causing the reproduction rates of bats to decline. Throughout the past decade, reproduction rates of bats have rapidly decreased. The main reason for this is the ongoing decline of the insect populations, which are primary food sources for bats. Reasons for this decline include habitat and biodiversity loss, use of pesticides, and harmful species. According to a study conducted by Dr. Power of Bristol University (UK) “long-living animals that have slow reproduction rates.” (quote directly from the article). Bats are more likely to be affected by climate change, as they rely on the climate for reproduction. These are causing bats to become a more endangered species, as more than half of the population of bats in the United States is listed as endangered and or is likely to become endangered.

Ruffed Grouse
Bonasa umbellus
Asa Hannert-Dawson and Lajlim Kick

Climate change is positively impacting the Ruffed Grouse. Like most birds, grouse thrive when the temperature is warmer because there is more food for them to eat. However, during the winter, grouse have to eat twigs. The grouse’s diet is primarily insects and berries, plus acorns in the fall, but none of those are available in cold weather. Warmer winters means earlier spring, so they will have access to the food for more of the year.

Northern Cardinal
Cardinalis cardinalis
Clare Exley and Lauren Harris

Northern Cardinals are not considered threatened or endangered but they are subject to a variety of hazards. Due to more farms being built and people managing their lawns, Cardinals are exposed to insecticides or other chemicals which can be harmful. They can also have collisions with windows and be attacked by outdoor cats. As spring and summer time gets warmer it is getting harder for birds of all types to raise their nestlings. The probability of birds being able to raise one nestling has dropped by 46% when temperatures are unusually high. Because of climate change and warmer temperatures we may see fewer cardinals in the future.



JANUARY



FEBRUARY



MARCH



APRIL



MAY



JUNE



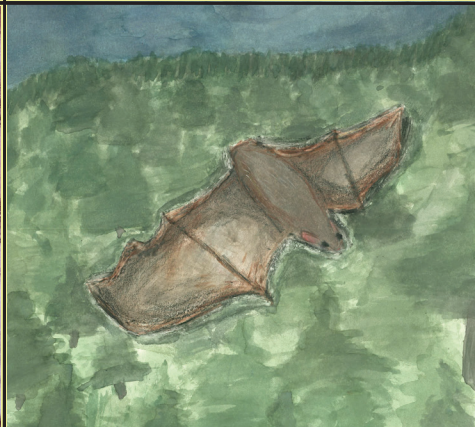
JULY



AUGUST



SEPTEMBER



OCTOBER



NOVEMBER



DECEMBER