

BRIDGER BOWL SUSTAINABILITY

PSCI 492



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Table of Contents

| | |
|---|----|
| <i>Summary</i> | 2 |
| <i>Department Sustainability Initiatives</i> | 3 |
| <i>Reusable Bottles</i> | 7 |
| <i>Compost Coaches</i> | 8 |
| <i>Interpretive Signage Project Inspiration</i> | 9 |
| <i>First Draft of Kid Animal Signs</i> | 11 |
| <i>Animal Tracks Rubbing Plates</i> | 12 |
| <i>Mock-Ups of Kid Animal Signs</i> | 13 |
| <i>Draft of Watershed/Snowpack Sign</i> | 19 |
| <i>Draft of Alpine Vista Sign</i> | 20 |
| <i>Interpretive Sign Proposal</i> | 21 |

Summary

I started my independent study by researching sustainability initiatives that Bridger Bowl was implementing and comparing it to other ski resorts sustainability initiatives. To gain a better understanding of sustainability at Bridger Bowl, I looked over Bonnie's comprehensive list of Bridger Bowl sustainability initiatives. I also looked over the last three years of the National Ski Area Association Climate Challenge reports to learn more about Bridger Bowl and other ski resorts sustainability efforts. From this research I created a list of departmental sustainability initiatives that Bridger Bowl could implement. I presented this list to the department heads at Bridger Bowl to try and get them thinking about sustainability within their departments.

From my research I identified a project that I wanted to work on during my semester with Bonnie. My project was centered around community outreach through interpretative signage. The theme for the sign project was to acknowledge Bridger Bowls place within the larger ecosystem. Bonnie and I worked to make two sets of signs. One focused towards kids, and one focused towards the public. The kid signs will be 10-15 animals that can be found at Bridger Bowl and will potentially be hung in trees. These signs will be smaller and will hopefully be used by the Snowsports department and families as a talking point or as a scavenger hunt to find all the animal signs.

Our other signs that are for the public will focus on the ecology, geology, and history of Bridger Bowl. We currently have two bigger signs underway and hope to continue to add more signs each year. We are working with Gallatin Watershed Council (GWC), Stacey Townshend, and Katie Christiansen on a sign that focuses on the role of snowpack within our watershed. The goal of this sign is to help bridge a connection between the use of snow for recreation and the role snow plays in our watershed. This sign will hopefully be a part of a larger sign project that GWC is working on. The second interpretive sign is a panorama of the mountain ranges that can be seen from the top of Alpine lift with prominent features labeled.

Along with the interpretative sign project, I was able to help Bonnie work on selling reusable water bottles next season and create a volunteer opportunity at Bridger Bowl. Throughout the semester, I learned a lot about how sustainability departments function within a larger organization. My time at Bridger Bowl taught me the value of reaching out to other people and organization for help with projects. I found that working with multiple people on a project created a sense of community.

Department Sustainability Initiatives

Food and Beverages

- Increase and improve signage to educate guests about how to sort organics, recyclables, and waste properly
- Free Aire refrigeration economizer
 - Planning to install in new JBL still?
 - Can we retrofit Saddle and Deer?
- ✓¹Phase out plastic straws; paper/compostable straw upon request
 - Sip lids
- Beverages at discounted price with reusable cup/mug
 - ✓Cup cupboard at DPC
 - Collapsible cups (sale at food and beverage)
- ✓Replacement of non-essential single use products with reusable products
 - Focus on putting less garbage in people's hands – how can we expand this?
- Employee run waste sorting system
 - Tray drop off
- “Trash Talkers” who coach guests on how to recycle/compost and sort their trash properly
 - Possibly have volunteers for this – receive community volunteer credits
- Expansion of recycling and composting programs
 - ✓We are doing well, but could we do better?
 - Any ideas for improvements?
- Terracycle program – are there specific products in retail shop we could use it for?
- Use a food dehydrator to convert 70% of food waste into soil amendment
 - In kitchens that generate more food waste, maybe JBL - a dehydrator could reduce volume of waste going on to composting
- Increase the price of single-use bottles to encourage use of reusable bottles and keep costs lower on reusable fills.

Guest Service/Marketing/Events

- Education and stewardship programs
 - SKE-COLOGY, Birding on Skis, Ski with a Ranger, Trees and Skis, Summer programs/events (Alta)
 - Ace's Wild Adventure: a sustainability and ecology-focused program geared toward kids (A-Basin)
 - School programs or camps on the mountain in the off season
 - Drink Mountain Tap and Slow the Flow program (Snowbird)
 - Integrate water snow melt testing with school program
- ✓Environmental and sustainability educational signs around mountain and in buildings. Doing it but make it bigger, more visible
- Stone paper trail maps
- Trail map collection bins for reuse
- Trail maps include partner logos and sustainable slope badges
- Host a Sustainability Educational/Fundraiser Event
 - Save Our Snow Celebration paired with a Demo Day (A Basin)
 - Earth Day
 - B Inspired

¹ ✓ indicate that Bridger Bowl has done this initiative, but that it could be improved

- Mountain community clean-up day
- Partnership to create individual carbon off setting program (guests click box to pay to offset carbon value of their ski day, add on to that days or seasons sale)
- Regular social media posts promoting sustainability
- Promote steps guests can take to reduce their impact
- On the resorts website have links to the sustainability webpage from other webpages to help show support
- Sustainability video series on website
 - for BB: Explaining composting, wastewater vertical flow treatment wetland, energy saving methods
 - Meet staff members (community)
- Launch a branded Environmental Campaign
 - A-Basin's Sustainability Team Slogan: "We have the power to save the powder!"
 - Forever Project
 - Play Forever
 - Blue thinks Green
- Have sustainability focused prizes at events
 - Reusable bags
 - Collapsible cups

Snow Sports

- If we get educational signage on mountains, encourage instructors to bring kids to the signs
- Train instructors about the ecology on the mountain to then teach kids and adults

Administration/HR

- Environmental donations
 - Buy a pass. Plant a tree. Play forever.
 - Play It Forward Wednesdays
 - Snow Huggers Club (donate to an environmental organization/non-profit supporting climate change and get one-time discounts and deals at the resort) (A-Basin)
 - Employees and guests can donate to an environmental fund, with the resort matching 100% of donations
- Ask guest if they would like to round up their purchase to donate to specified environmental cause (extra payment designation and collection in cart or at register).
 - Separate 501c3 foundation to manage donations to environmental organizations
- Track community volunteer hours by department
- Departments collaborate on purchase orders to reduce the number of delivery truck visits

IT

- Program to automatically shut down base area computers every night (Grand Targhee)
- Donate/recycle all e-waste

Lift Ops

- Assess lifts for energy saving possibilities
- Assess lift recycling bins for possible improvement

Facilities

- ✓ Implement off-season procedures designed to limit electricity use from buildings not in use (Document procedure)
- ✓ Occupied/unoccupied settings, motion and light harvesting sensors, and multi-stage motors for water and air heating units
- CleanBurn Technologies furnace

- Walk-in coolers and freezers with high efficiency electronically commutated (EC)
- Energy efficiency audit
- See if any doors on mountain should be replaced to help with insulation
- ✓Energy efficient boiler
- ✓Energy star appliances
- ✓Installation of additional water bottle filling stations
- Smart Meters
 - Not possible yet
 - First phase in Missoula
- ✓Upgrade lighting to LED
 - Bridger is currently working on this
- EV charging stations
 - Bridger is currently debating where to put them
- ✓New building controls and real-time monitoring systems
 - Already doing a good job at this
 - Any new products that have come to market that we can implement?

Rental/Retail

- Terracycle program
- Buyers in the retail and rental shops create a letter to vendors stressing the importance of sustainability in their purchasing decisions
 - We are looking for a collaboration between purchasing, accounting, and sustainability on a vendor letter stressing the importance of sustainability in their purchasing decisions
- Retail store implemented a “no single-use bags” policy and offer guests reusable shopping bags
 - Purchase reusable cloth bags with Bridger bowl sustainability logo for sale (or a give-a-way item)
- Increase the price of single-use bottles to encourage reusable bottles

Vehicle/Slope Maintenance

- ✓Recycle
 - Doing a good job at this, but have a list below of what other resorts have recycled
 - MBI cartridge AD9 Core, miscellaneous auto parts [air filters, parts, oxygen sensors, disc pads, etc.], flat panel monitors and miscellaneous electronic equipment, brake cleaners, V-gloves for electrical work
- Replacement of older, less efficient snow making equipment
 - Viper land guns
 - SMI Super Puma fan gun
 - HKD Impulse tower snow guns
 - SnowMatic system monitors and controls the system (snow making)
- Replacement of groomers and snowmobiles (Bridger Bowl has all Tier 3 Groomers)
 - Tier 4 diesel
 - Pisten Bully 600 E+ snowcats (“green groomers”)
 - Taiga electric snowmobile
- SNOWRIGHT system (improving snowmaking and grooming efficiency) (Wachusett)
- Purchase 33-passenger hybrid shuttle buses
- Installation of a new networking monitoring/automation equipment for the Water Treatment and Snowmaking operations assist staff in running departments more efficiently by managing water usage systems remotely

- Purchased B-20 fuel rather than B-10 biodiesel fuel
- ✓Continue working with Forest Service on how to best manage land and summer trail work

Ski Patrol

- No ski patrol specific initiatives mentioned

General

- Implementation of sustainability plans for each department
- Implement transportation Initiatives
 - monthly ski-giveaway sweepstakes for those who arrive on the bus or in cars carrying three or more guests.
 - Hand out coupons for free hot cocoa for guest & employees as they unload the bus or are carpooling
- Encourage employee carpooling
- ✓Ride Amigos App
- Shut off lights for an hour on March 30th to observe Earth Hour
- Work towards zero waste events
 - ✓Bridger did one Zero Waste wedding and forest service meeting
- ✓Support local and nation climate change advocacy efforts
- Sourcing solar energy from a Colorado-based project to run snowmaking and some lifts (A-basin)
 - Not currently available in Montana, but keep watch on it
- Carbon-offsets partnerships with local projects and new renewable energy projects
 - Offset gasoline, diesel, and propane use
 - ✓Bridger offsets through Native Energy and Montana Grasslands
- Use of eco-friendly cleaning products
- ✓Support the Citizen's Climate Lobby and their effort to introduce a Carbon Tax
- ✓Attend government meetings and community advisor committees

Reusable Bottles



I took this photo at Snowbird to show Bonnie an example of a ski resort that is selling reusable bottles and promoting sustainability.

ANTI-BOTTLES

vapur 2022 PRICE SHEET
hydration

1.5L/50 oz
WHSL: \$6.99
CASE PACK: 12 PCS

SHADES

TRANSLUCENT BLUE 10272

1L/34 oz
WHSL: \$5.99
CASE PACK: 12 PCS

SOLIDS

BURGUNDY 10279, ADMIRAL BLUE 30058, WHITEOUT 30054

ECLIPSE

BLUE STEEL 30073, GRAYNI OAK 30075

GRADIENT

MALIBU TEAL 30004

ELEMENT

GREY 10208, WATER 10140, BLACKOUT 10271, NIGHTBLUE 10214

.7L/23 oz
WHSL: \$4.99
CASE PACK: 12 PCS

SOLIDS

ADMIRAL BLUE 30008, MARGOLD 30044, WHITEOUT 30042, MAGENTA 30000, BLACK 30046

ECLIPSE

SEA GLASS 30071, BLACKOUT 30077

GRADIENT

LAVENDER 10282, MALIBU TEAL 10277

ELEMENT

WATER 10157, FIRE 10159, NIGHT BLUE 10211, CLIVE 10009

.5L/18 oz
WHSL: \$4.49
CASE PACK: 12 PCS

SHADES

CYAN BLUE 10195, COOL GREY 10201

.4L/14 oz
WHSL: \$3.49
CASE PACK: 12 PCS

KIDS

SKATEBOARDS 30128, DINOSAURS 30127, HEARTS 30129, BUTTERFLY 30131

AFTERHOURS

WANDERVINO
PORTABLE WINE KIT
WHSL: \$7.99
CASE PACK: 6 PCS

WINE
750 ml CARRIER
WHSL: \$4.99
CASE PACK: 6 PCS

RED 40022

FLASK
300 ml
WHSL: \$2.99
CASE PACK: 6 PCS

TEAL 40024, MIDNIGHT BLUE 30133, GREY 40026

This is the product line of reusable bottles that Bonnie proposed in the budget for Bridger Bowl to sell next season (the budget item was approved).

Compost Coaches

My research on sustainability efforts that other ski resorts were taking led me to discover the “Trash Talkers” initiative. This gave me the idea to create a volunteer opportunity at Bridger Bowl for “Compost Coaches.” Bridger Bowl expanded their use of compostable materials this past season and proper waste sorting is an important aspect of using compostable materials. We did not have the budget to try and completely reimagine the waste sorting stations on the mountains, but we could ask for volunteers to help us educate the public on proper waste sorting.



Interpretive Signage Project Inspiration

ALTA SINCE 1938

SKI STAY

SKE-COLOGY

Learn about Alta's mountain ecology on skis.

Road: Open | Parking: Available

RECREATIONAL LEARNING ON SKIS.

Hidden throughout the trees off the Sunnyside and Albion lift runs, this hide-and-seek type program is a great way to get your kids interested in the mountain environment while skiing. As a way to give back to our community through education, we have set out ten signs to be found by our younger skiers. The excitement of discovery and exploration is what keeps this program alive. Ske-cology takes education outside the classroom's four walls and turns the great outdoors into a multi-subject, educational and fun experience at Alta.

Alta's Ske-Cology program that I discovered during my initial research and largely inspired my semester project.



How Solar Works

BRIDGER BOWL SOLAR SYSTEM STATS

System capacity: 50 kW
Annual energy production: 68,505 kWh

ENVIRONMENTAL BENEFITS (over 25 year lifespan)

- ✓ Avoid emissions equivalent to 2,961,519 miles driven
- ✓ Avoid emissions equivalent to 1,324,182 lbs of coal burned
- ✓ Avoid emissions equivalent to 422 tons of waste sent to the landfill
- ✓ Equivalent to carbon sequestered by planting 20,028 trees

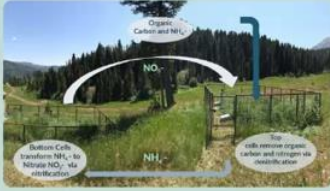
Solar electric systems use sunlight to produce electricity. Here's how:

1. Using the photovoltaic effect, sunlight activates the panels and produces electricity.
2. Electricity passes through an inverter and is converted to power that is usable within the building.
3. The power produced by the inverter is consumed by the building's appliances.
4. Any extra energy is transferred to the utility grid and credited to the system owner.

Solar designed and installed by **ONSITE ENERGY** SOLAR ELECTRIC SERVICES

This renewable generation project received funding through the NorthWestern Energy Efficiency Plus (E+) Renewable Energy Program. The program is established with Universal System Benefits Program funds collected from all NorthWestern Energy customers in Montana.

BRIDGER BOWL VERTICAL FLOW WATER TREATMENT WETLANDS



Organic Carbon and NH_4^+

NO_3^-

NH_4^+

Nitrification Cells transform NH_4^+ to Nitrate NO_3^- via nitrification

Denitrification Cells receive organic carbon and nitrogen via nitrification


This pilot project between Bridger Bowl, MSU Civil Engineering Department and Montana Department of Environmental Quality began in 2012, to test the use of constructed wetlands water treatment technology and native plants in the high elevation Montana environment.

The MSU team provided the design and technical oversight, Rocky Mountain Engineers provided the construction plans and hydraulic calculations, and Bridger provided the system construction and equipment.

Special thanks to Bob Allen - Bridger Bowl and Otto Stein - MSU for their leadership in the development of this wetlands

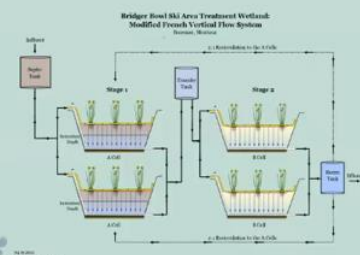
This is now a fully functioning system, treating 10,000 gallons of effluent a day to a high level of water quality before discharge into a subsurface drain field.

The Montana DEQ has adopted the technology; the construction and operation of the system, design standards, operational guidelines and best practices for system startup, paving the way for other treatment wetland applications in the region.



COST EFFECTIVE
COLD CLIMATE
NATURAL TREATMENT

Finalist:
NSA
Innovation in Sustainability
Award 2020



Bridger Bowl Ski Area Treatment Wetlands:
Modified French Vertical Flow System
Bridger Bowl

Images of some of the existing sustainability signage at Bridger Bowl.



I took this photo at Big Sky so we could show the facilities department how the signs could be placed on existing infrastructure so they would not be in the way of any grooming.

First Draft of Kid Animal Signs



SHORT-TAILED WEASEL (ERMINE)

Mustela erminea

The Short-tailed weasel sports a winter coat of white, with a black tip on its tail. Ermine live in burrows, rockpiles or in hollow trees. Well adapted for Montana winters, they specialize in hunting voles under the snow.



PORCUPINE

Erethizon dorsatum

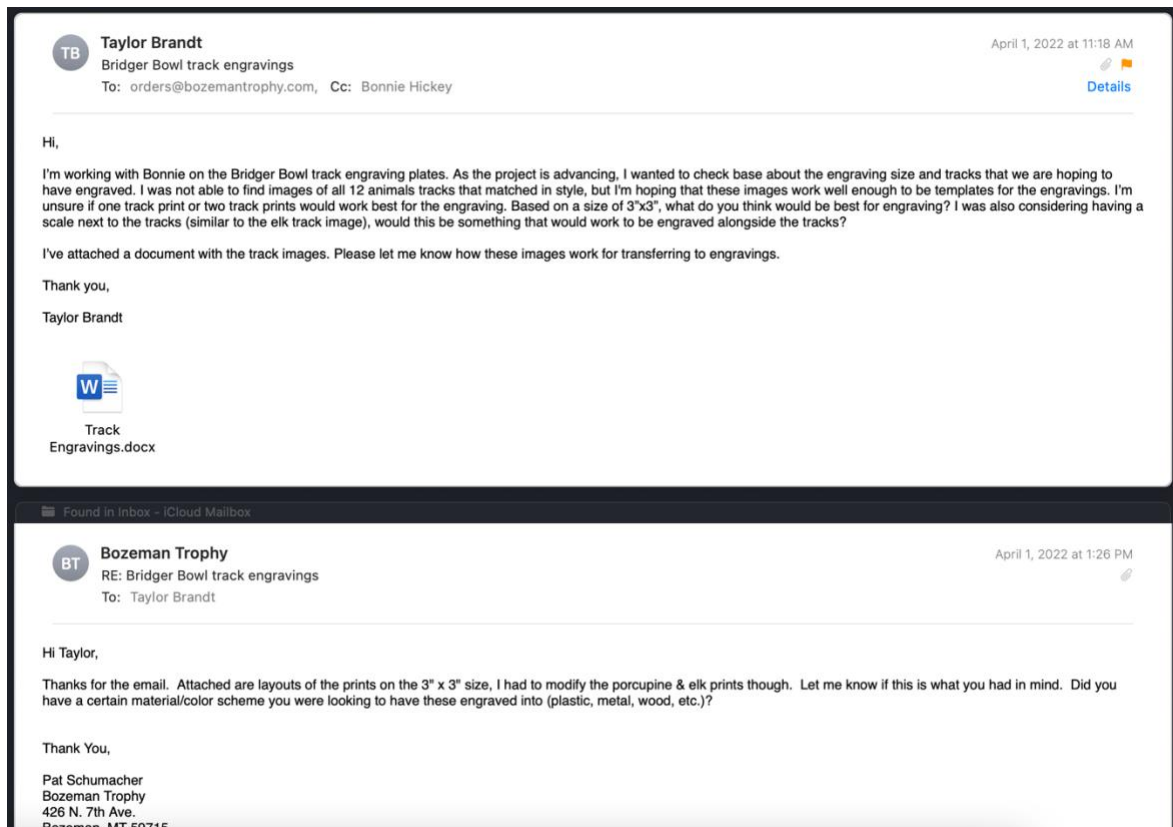
Porcupines have three layers of hair. Under fur that is closest to their body and keeps them warm. Soft guard hairs that cover most of their body and make them look big. Quills that are specialized hairs that cover their whole body besides their belly and are razor sharp. Porcupines cannot shoot their quills, but the quills are attached very loosely and all it takes is a light touch for the quills to stick to a predator. Porcupines have curved claws that allowed them to climb tree and may stay up in trees for several days in a row. They are nocturnal and have poor vision but have excellent hearing and sense of smell. They're one of the largest rodents in North America. In Montana, porcupines are found just about anywhere that there are coniferous trees to feed on. In the winter, porcupine develop a thick under fur and spend most of their time in their den and come out regularly to feed.

The Kid Animal Signs were my main focus throughout the semester. I researched information on the animals and wrote up some blurs about each animal for the signs. I later worked on finding images that were the proper size/quality to be printed on the signs and that we could get permission to use.

Animal Tracks Rubbing Plates



Mock-up of animal tracks for rubbing plates



Part of email exchange with Bozeman Trophy

Mock-Ups of Kid Animal Signs



MOUNTAIN GOAT

Oreamnos americanus

Mountain goats are commonly found on the Bridger ridge. Their hooves have hard outer edges with soft centers that allow them to navigate steep, rocky, and snow-covered terrain. In the winter, they have long hairy white coats that form a beard under their chin.

Placeholder
for Tracks
3" x 3"



RED FOX

Vulpes vulpes

Red foxes have black legs and a white-tipped tail. Red is their most common body color, but they can also be black, silver or a cross between red and silver. They are born deaf but develop excellent hearing that helps them catch prey beneath snow.

Placeholder
for Tracks
3" x 3"



COYOTE

Canis latrans

Coyotes are known for their high-pitched yodeling and yips. They are bigger than red foxes, but smaller than wolves. Most coyotes are grayish brown with a white underbody and have a bushy tail with a black tip. They have a wide habitat range, but prefer prairies, open woodlands, and brushy or boulder areas.

Placeholder
for Tracks
3" x 3"



BLACK BEAR

Ursus americanus

Black bears hibernate during the winter so you most likely won't see one while skiing at Bridger Bowl. Keep an eye out for them in summer, even in trees since they are excellent climbers. Not all black bears are black, they can also have fur that is brown, blond, or cinnamon. In Montana, a black bear's diet can consist of rodents, insects, elk calves, trout, pine nuts, grasses, and other plants.

Placeholder
for Tracks
3" x 3"



MOOSE

Alces alces shirasi

The moose that inhabit Montana are the smallest subspecies of moose in North America. Their long legs allow them to maneuver through deep snow. When the snow melts, they spend most of their time near or in water. It's best to not approach moose because they can be unpredictable and charge when provoked.

Placeholder
for Tracks
3" x 3"



LEAST CHIPMUNK

Tamias minimus

The least chipmunk is the smallest member of the squirrel family. They are distinguished by their small size, long tail, and lateral stripes. They hibernate, but also store food and likely wake frequently during the winter. They can be spotted by their quick darting movements and how they carry their tail vertically.

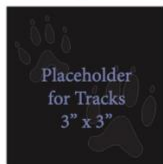
Placeholder
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SHORT-TAILED WEASEL (ERMINE)

Mustela erminea

The short-tailed weasel sports a winter coat of white with a black tip on its tail. Ermine live in burrows, rockpiles and hollow trees. Well adapted for Montana winters, they specialize in hunting voles under the snow.

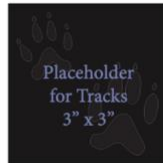


We are still waiting to get photo permission for an image for the porcupine sign

PORCUPINE

Erethizon dorsatum

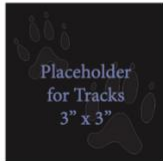
In Montana, porcupines are found just about anywhere there are coniferous trees to feed on. In the winter, they develop a thick under fur and spend most of their time in their dens. Porcupines cannot shoot their quills, but they are attached loosely, and a light touch can cause the quills to stick to a predator.



BOBCAT

Lynx rufus

The bobcat is named after their short and bobbed-like tail. They are about twice as big as a house cat and are fierce predators. Their diet consists of rabbits, hares, voles, mice, red squirrels, wrens, sparrows, grouse, and, if they are skilled enough, deer and adult pronghorn. Bobcats like to hang out in rocky areas and conifer forests.





ELK

Cervus canadensis

Elk range in color from dark brown in the winter to tan in the summer. Their head, neck, belly, and legs tend to be darker than the rest of their body. Elk are ruminant animals which means they will regurgitate their food and re-chew it to help with digestion. This is known as chewing cud.

Placeholder
for Tracks
3" x 3"



MULE DEER

Odocoileus hemionus

Mule deer are known for their large ears. They normally have brown coats with a white colored rump. Mule deer are herbivores and like to browse on Douglas fir and Ponderosa pine. They do not run but instead have a distinctive bounding leap. One leap can carry them distances up to 8 yards.

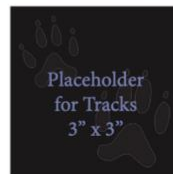
Placeholder
for Tracks
3" x 3"



YELLOW-BELLIED MARMOT

Marmota flaviventris

The yellow-bellied marmot is almost always found near rocks. They can hibernate for up to 8 months and emerge during early spring. They may go back to sleep in June due to dry conditions and lack of green vegetation and reappear in late summer. They can also be referred to as "whistle pigs" due to their distinctive loud whistle.



The design of these mock-ups was done by Michael Gill.



Taylor Brandt

Notes of mock up

To: Michael Gill, Cc: Bonnie Hickey

April 1, 2022 at 4:42 PM



[Details](#)

Hi Michael,

Bonnie and I just met and went over the mock up of the Kid signs. We noticed a few changes we wanted to make to the text. I made notes on the pdf you sent with corrected text. Let me know if my comments on the pdf work for you to see and replace the text. We were also wondering if there was a photo of an ermine in the winter that we could use. I left a note about that and a possible source for other images that we will need to talk to Erin about.

We wanted to make sure that the signs have enough white space for the bolts to be drilled in when hanging the signs up. A border of 1" on the top and bottom should ensure that we have enough room to hang the signs. We are checking with Bozeman Trophy about the engravings but would like the tracks to be 3"x3", so just a little more room than what you have now. We were imagining having the image scaled down in size a bit to help accomplish these new size dimension.

We would love to see another mock up of the signs and think we are very close to being able to get them printed.

Thank you so much for working with us!

Let me know if you have any questions or concerns.

Taylor



High Res
2021-2...py.pdf



Michael Gill

Re: Notes of mock up

To: Taylor Brandt, Cc: Bonnie Hickey, Erin O'connor

April 2, 2022 at 3:48 PM



[Details](#)



Siri Found a Contact

Michael Gill
mgill@bridgeterbowl.com

[Add](#) ✕

Hey Taylor,

Thank you so much for the edited pdf, that worked great. I have changed the top and bottom margins to 1". Made the track space to a 3" x 3" and made text corrections and adjusted layout for new sizes. I used the weasel image because that was the only hi res image on that site. I will wait to see what Erin comes up with for needed images and then go from there. Attached is a new proof.

One email exchange with Michael Gill

Draft of Watershed/Snowpack Sign



This is the draft of a sign that is a part of GWC’s signage project, and we are working to make a sign that is like this one, but specific to Bridger Bowl.



This is an example of how the sign will be changed to be for Bridger Bowl. This is from the above illustration, but has more snow added to it.

KC Katie Christiansen
Hydrology Sign follow up
To: Bonnie Hickey, Taylor Brandt, Cc: Stacy Townsend, Brooke Helstrom
April 8, 2022 at 12:23 PM
[Details](#)

Hi Bonnie and Taylor,

Great to get to talk again. Stacy, Brooke, and I have all had the chance to put our heads together on the question of a budget for the updates on the Hydrology Sign as we discussed yesterday morning, and I wanted to write to share that info.

One note first is that we decided that I will be taking over the role of project management on this as we move forward, including completing any new content development (e.g. writing new sections), in partnership with your team. Brooke will still very much be involved as we proceed, including providing content review on behalf of the GWC team, but is graciously handing the baton over to me on these tasks of project management/communications and new content development. The following budget reflects this update.

We are providing our budget as a range in order to only bill you for the work that we do, as some of the updates are still TBD (e.g. are we going to write a new section in place of the "Supply a City" text, or is it best to take it out entirely). We like to work efficiently, but most importantly want this sign to be exactly what it needs to be for Bridger Bowl. Hence, the range to give us space to make it right without the risk of overcharging. I hope that will work for your board's review of the project.

The proposed changes we discussed include:

- updating the map location to show BB, including BB's logo
- swapping the "Water Droplet's Journey" text with "Where it all begins" to highlight snow as a major theme
- swap the muskrat image out for a fish, and write new text about recreation to accompany the new image
- take out the park imagery and replace with the cow painting, adding a blurb about agriculture
- removing the text in the "Supplying a City" box, or rewriting it to focus more on ecology and/or recreation as they both relate to runoff and drinking water.
- make the Bridgers appear more snowy

To the last item—digitally updating the Bridger image—we wanted to offer for your consideration the possibility of me painting a totally new image of the Bridgers that shows the eastern slope to really place Bridger Bowl in the scene. We know this is going to be a centrally-placed sign on your property and want to offer truly customizing the scene to help viewers place themselves on the landscape and better connect the concepts presented on the sign with Bridger Bowl specifically.

In terms of how that would work, to digitally edit the existing image to make it more snowy will require Stacy's time, and instead we wanted to offer putting that money into a totally custom illustration for you (that will then also be available to use as we proceed with future signs at Bridger Bowl over the coming years).

To address all the above updates *without a custom painting*, our total cost range is: \$3,205 - \$3,690.

If you wanted to do a custom Bridger Range painting that displays the east slope and Bridger Bowl specifically, I would charge \$500 for that illustration. It would cut time off of Stacy's work, which is to say the actual cost difference would be less than \$500. If you'd like to pursue this option and need to present a number to your board, you can say the very upper end of the range would be \$3,690 + \$500 = \$4,190 (but again this feels higher than we would actually ever bill considering the way the work would be redivided).

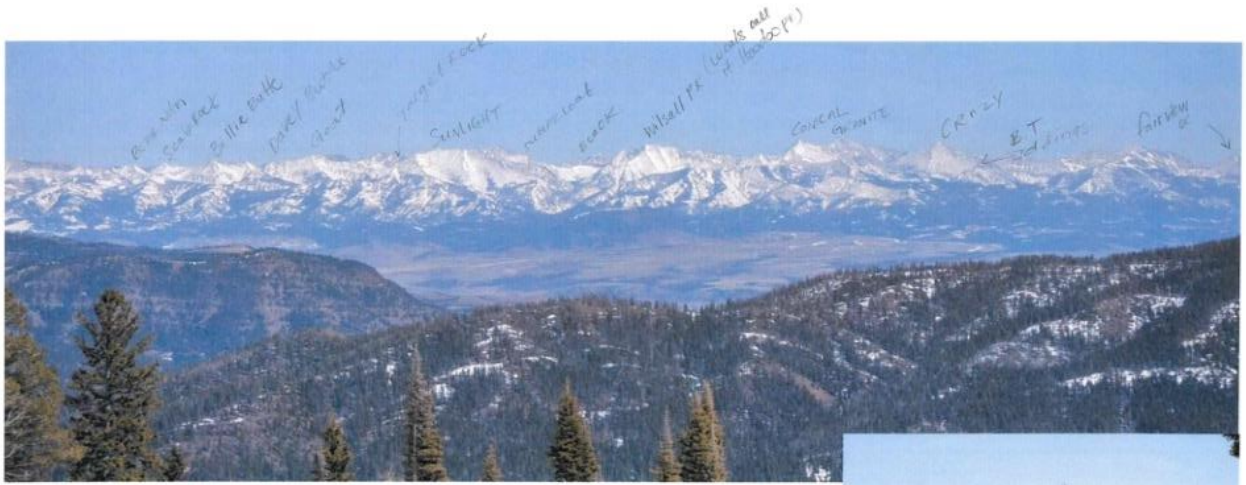
I hope this information is straightforward and presentable to your board. I don't mean to muddy the waters with the custom illustration suggestion, but we see an opportunity to make this a really special piece for Bridger Bowl and wanted to give this another chance for consideration.

Please reach out to any of us with questions or thoughts, and my apologies in advance if my replies are delayed during my upcoming travels.

Thanks all,
Katie

This is an email from Katie Christiansen discussing the changes that will be made to the sign draft above.

Draft of Alpine Vista Sign



placeholder History of area
Indigenous and Jim Bridger



Placeholder – Crazy Mountain range
description



Interpretive Sign Proposal



Bridger Bowl Ski Area Sustainability Educational Signs Project Proposal April 18, 2022

The Gallatin Valley has seen tremendous growth in recent years, and this has brought many new users to Bridger Bowl. Beyond the trail signs and safety signage that appears on the mountain, there is room and scope to include additional interpretive signage. These signs can be used to create a meaningful connection between our guests and our environment. By engaging guests in this way, we hope to illicit an appreciation for the environment and community that makes Bridger Bowl special.

PROJECT DESCRIPTION The overall vision includes two types of signs.

1) Smaller interactive children's signs that can be placed alongside trails and tree trails where they can be discovered by children while skiing or hiking with their family or while in lessons. These signs will have imagery of animals that live at Bridger along with a short description and a plastic plate with the animal's track engraved which can be felt or used to make a rubbing. These signs are being designed in house.



MOUNTAIN GOAT

Oreamnos americanus

Mountain goats are commonly found on the Bridger ridge. Their hooves have hard outer edges with soft centers that allow them to navigate steep, rocky, and snow-covered terrain. In the winter, they have long hairy white coats that form a beard under their chin.

Placeholder
for Tracks
3" x 3"

2) Interpretive signs for the general public.

Example 1) A depiction of the panorama seen from the top of Alpine lift with prominent landscape features labeled. Sign designed in house.

Example 2) Additional signs would utilize the illustrations and design talents of Townsend Collective, a local business developing interpretive signage for Story Mill Park as well as other regional organizations. A project we are working with them on is the watershed sign pictured

below. This sign provides an opportunity to inform guests about the important role of mountain snowpack in the overall Gallatin Valley watershed.

This particular sign is part of a larger project between the City of Bozeman, Gallatin Watershed Council, and Townsend Collective, however they are graciously permitting us to subtly redesign the sign to make it more relevant to Bridger Bowl. The illustration of the mountains will have a more pronounced snowpack. Bridger Bowl’s logo and a “You Are Here” arrow will locate Bridger Bowl on the watershed map insert. We will replace the muskrat with a trout and the playground image with a steer and remove the description of the city water supply, to better establish the connection between the snow we ski on and agricultural and recreational activities in the off season.



By utilizing and adapting narratives and illustrations from Townsend Collective’s extensive environmental awareness portfolio, we can create customized signage at a reduced cost.

REQUEST FOR FUNDING

Our request for support from the Bridger Bowl Foundation for this educational project is:

| | |
|--|--------------|
| (12) 14” x 14” children’s interpretive signs \$38 each | Total \$456 |
| (1) 25” x 48” Alpine Vista sign | Total \$215 |
| (1) 25” x 48” Watershed sign | Total \$3925 |

Total summer 2022 Interpretive signage funding needed is \$4596, although actual costs may come in lower than the estimates obtained.

Future signage funding would be requested separately on a 1 per summer basis with 2-3 more signs envisioned.

Thank you for considering this request.

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