



Range of Light Group
Toiyabe Chapter, Sierra Club
Counties of Inyo and Mono, California
P.O. Box 1973, Mammoth Lakes, CA, 93546
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March 16, 2020

Tammy Randall-Parker, Forest Supervisor
c/o Janelle Walker, Project Leader
Mammoth Ranger District
PO Box 148
Mammoth Lakes, CA 93546

Submitted via email: Janelle.walker@usda.gov

RE: USFS NOPA Snowmaking and Woolly's Adventure Summit Projects

Dear Forest Supervisor Randall-Parker:

The Range of Light Group (ROLG) is part of the Toiyabe Chapter of the Sierra Club and consists of over 400 Sierra Club members in Inyo and Mono Counties. We treasure our public lands, forests, and wildlife. On behalf of the Sierra Club's Range of Light Group Executive Committee, I'd like to express our thoughts on expanded snowmaking by Mammoth Mountain Ski Area (MMSA) and their plans to add new activities at Woolly's Adventure Summit. These are two projects with different levels of impacts and benefits to the public. Details and supporting data in the Notice of Proposed Action (NOPA) lack information that would highlight the impacts and benefits and make it clear if the impacts to the environment are worth the sacrifice. An overarching question is what business ventures best serve the general public and belong on public land?

We recognize the value of Mammoth Mountain to the local economy and the wonderful recreational opportunities it offers the public. Unfortunately our weather and our world are changing rapidly because of climate change. It is because of climate change that MMSA is pursuing these projects. Snowmaking is a necessary stopgap measure as MMSA transitions to summer recreation. Yet, snowmaking and Woolly's expansion only contribute to the problem. We should all be working toward net zero emissions and all new projects should be part of the solution instead of the problem.

Missing Alternative: Moving/Removing Woolly's

We would like to point out that there are alternatives other than "no action" for the expansion of Woolly's that should be considered in contrast to the benefits to the public. The Sierra Club supports recreation on public lands as long as it doesn't impact wild land preservation or wildlife habitat. The Sierra Club also believes economic cost/benefit analysis should be one of the components in the decision-making process affecting public lands. The proposed Woolly's expansion would affect unspoiled forest terrain. Is this expansion justified? How many more tourists will come to Mammoth because of the new activities to Woolly's? How many people does it serve? Is Woolly's profitable now? How much would the added activities help compensate for lost revenue for winter recreation?



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There is little infrastructure at Woolly's now and it takes up only one-third of the area close to the road within the special use permit (SUP). The rest of the forest is largely unspoiled. The office trailers at the entrance are portable trailers. The parking lot is dirt. The sledding area could be re-contoured. Instead of adding more permanent features like a lodge, an expanded paved parking lot carved out of the hillside, excavating more of the hillside to expand and reorient the slide, adding roller coaster track, adding a people loading station for the mountain coasters, putting more noisy motors in the forest, and using the entire SUP area, Woolly's could be removed.

Woolly's Adventure Summit could be moved or removed instead of expanded. State Route 203 could be a boundary: human activities on the south side, wildlife on the north side on the way up to the Main Lodge. One of the management approaches listed on page 56 of the 2019 Inyo National Forest Land Management Plan is to "Decommission recreation facilities when use no longer supports the activity, there is decreased use by the public, or the maintenance demands of the facility exceed the use of the facility."

Alternative: Scale Down Woolly's—no coasters

The Sierra Club supports recreation on public lands. However, recreation covers a broad spectrum of activities. Hiking, climbing, mountain biking, camping, and fishing are good fits in a natural setting because of they require little or no infrastructure. However, the coasters and ropes courses require a lot of infrastructure. Infrastructure mars the beauty of the natural surroundings, that so many people, visitors and residents value. While coasters are fun activities they do little to connect people to the natural surroundings. The speed and need to concentrate on hanging on prevents a rider from even taking in the view, let alone notice a chipmunk or hear a bird. The proposed coasters at Woolly's are rides. The majority of visitors come from Southern California where there are many amusement parks with roller coaster rides. Coasters do not have to be here.

The Ridge Rider at Heavenly Lake Tahoe has a footprint and changes the natural feel of the forest. The infrastructure includes track, bridges, overpasses at the loops, protective caging/fencing, a loading station, and a checkpoint station.¹ The Heavenly Epic Discovery FEIS/FEIR for an alpine coaster says the rails would usually be 3-6 feet above the ground and up to 15-20 feet above the ground in places. A 20-25 foot wide corridor would need to be cleared of vegetation for the track. The zip coaster has even more wires and lines running through the forest.² A 12-20 foot swath of vegetation needs to be cleared for it. Just how many trees will need to be removed to put in this infrastructure at Woolly's, a third or half? It is understood that the MMSA SUP area is a sacrifice area where human activities take precedence. However, the coasters would bring a busy and unnatural feel to the forest.

The mountain coaster track would run north-south through Woolly's Adventure Summit from the north-west corner of the permit area down to the parking lot. The elevation high point of the coaster

¹ <https://www.youtube.com/watch?v=lvfbdeLkNm4>

² <https://www.youtube.com/watch?v=exZ2ctyXV8k>



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is where the slope of the dome becomes steeper and might be difficult for wildlife to go up and around. The coaster track might cut off wildlife that moves through the forest now above the existing Woolly's tubing area. This would be easier to see if the NOPA provided topographic map with the SUP area superimposed. Tracks in the snow show that Chickorys live in the forest there and that bobcat and coyote pass through in winter. In spring, summer, and fall deer and bear probably pass through too. Well-placed wildlife cameras might show what wildlife uses the area. Will wildlife step through or over the track? Will there be a place for wildlife to pass under raised track? Will there be night lighting there?

The coaster tracks will also cut off a cross-country ski loop that starts at the Earthquake Fault parking lot, goes on the south side of Earthquake Dome, connects with the snowmobile Route C, passes through Woolly's on the road above the tubing area back to the parking lot. The first part of that route is a historic blue diamond Nordic ski route. As an alternative to adding the coaster activities to Woolly's, the blue diamond Nordic route could be extended to Woolly's in winter and turned into walking trails connected to the town in summer.

The mountain coaster might be an activity with little repeat business. People ski, bike, and climb repetitively to get better at it. Coasting requires little effort or skill and is something one does once for the experience or on occasion when their friends or grandchildren come to visit. The coasters are single-threaded activities and have a limited throughput of how many people can do them in a day. If it takes 5 minutes per person to coast to the bottom, that would be 12 people/hour or 96 people in an 8-hour day. It is unlikely people will be lined up to reach that potential. It will not come close to bringing in repeat business and revenue as skiing and mountain biking.

Expanded Snowmaking: What's the water Usage in Drought Years?

The EA states that on average only 100 af of water is needed to cover these 29 additional runs and that it would be a 43% increase in how much water is currently used for the ski season. It would be helpful if the EA presented data to support this claim. One hundred af/yr is not a significant amount of water, but is it a realistic projection, especially in drought years? Since the EA doesn't state how many acres have been covered by snowmaking in recent years so it is hard to determine how much of an increase in water the additional 206 acres will require. Covering 29 more runs with snow seems like a significant increase over the number of runs above the Main Lodge that are equipped with snowmaking equipment now. The Heavenly Mountain Resort 2017 Capital Improvements Project states that about 4 acre feet of water is consumed per acre to cover rocks, obstacles, and hazards with 5 feet of snow at the start of the season. For 206 acres, that would be 824 af of water.

Many of the proposed runs to be covered with man-made snow will be at lower elevations and will require more water to maintain them with multiple, repeated applications than those at higher elevations on the north face. Snowmaking equipment at the lower elevations means the runs could be kept opened the full duration of the season and do not have to close prematurely in spring. That also increases the amount of water to be used. Has this been factored in? How much water was used in the 5-year drought to make snow? That might be more representative of future water usage.



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Brad Rassler's article³ mentions that experts estimate that 10-15% of the water sprayed sublimates and never hits the ground. In addition to that, a measurable amount of the snow on the ground evaporates from wind and sun. The article states that it could add another 10-15% of water loss. This can be calculated with data from the weather stations on Mammoth Mountain and worked into the model. However, the EA points out that modeling will come after this decision is made. The need for snowmaking should increase as temperatures rise with climate change. The 2001 Breibart hydrology study of the Dry Creek watershed⁴ states the evaporative loss could be 50% in a dry year and 35% in a wet year. In an age of declining precipitation and precious water resources snowmaking may need to give way to higher priorities e.g. natural resources and domestic use. It is not be an issue now, but it will be as climate change worsens.

Monitoring Groundwater Usage

The Sierra Club is very concerned about protecting our natural resources and biodiversity. Unsustainable groundwater pumping impacts surface vegetation, local springs, and wildlife. The 2012-2015 droughts stressed the trees in the Dry Creek basin. For the next two years following the drought, trees died from bark beetle infestations. This increased the risk of wildfire.

Based on the Breibart study both the surface runoff and the groundwater flow from the north face of Mammoth Mountain, down the Dry Creek drainage and onto the flats around Deer Mountain. The surface snow on the flats percolates down into the ground and contributes to the aquifer too. The Burak 2015 thesis⁵ states that Dry Creek contributes to Big Springs, when in 2001, the connection wasn't clear. Depending upon the amount of water pumped, extractions from the Dry Creek basin could impact Big Springs to some unknown degree.

MMSA operates five wells on USFS land that tap the Dry Creek aquifer. Three of those wells are used for snowmaking. With this project MMSA is asking to put in two more wells. The USFS isn't subject to the California's Groundwater Sustainability Act nor is the Dry Creek basin a priority basin or even on the state's radar. However, the USFS has control over the groundwater in the Dry Creek basin and it is in the USFS' best interests to voluntarily manage it sustainably to preserve the aquifer and to maintain a healthy forest cover.

A rigorous groundwater inventory and monitoring program should be implemented with adaptive management, if it isn't already. There should be a plan in place that places caps on the amount of water that MMSA can extract in dry years and that sets trigger points for when pumping should stop. This type of data would provide a baseline of water use before water use increases with the expansion of the Main Lodge facilities. With the Base Land Exchange, MMSA will be able to tap into

³ <https://sustainableplay.com/snowblown-in-the-sierra-nevada/>

⁴ https://www.bren.ucsb.edu/research/2001Group_Projects/Final_Docs/mammoth_final.pdf

⁵ https://scholarworks.unr.edu/bitstream/handle/11714/2600/Burak_unr_0139M_11874.pdf?sequence=1



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the Dry Creek aquifer independently. A report should be published annually on groundwater levels and recharge modeling.

The EA states that additional groundwater pumping will be needed during drought years. If the EA underestimates the projected amounts of water to be used for snowmaking, then it underestimates the impacts to groundwater levels and connected springs. There should be full disclosure in the EA about how many and which wells have already dried up on Mammoth Mountain due to snowmaking. The EA argues it would put enough snow on the surface during a drought year to create a normal year of run-off and recharge. True, but leaving all of it in the ground might be even better. The EA estimates that the recharge rate would be 80%. This means 20% of what would be extracted would be lost. With a prolonged drought, there would be a continuous depletion of groundwater. Plus the amount would be extracted from the Dry Creek drainage but spread around the mountain in both the Mammoth Creek drainage and the Dry Creek drainage. It wouldn't all return to the Dry Creek drainage. Rain on snow events will seep in less.

The Breibart study explains that twenty years ago (2001), MCWD and MMSA both want to tap the Dry Creek aquifer: MCWD wanted 2,000 af and MMSA wanted 685 af. The study calculated how much groundwater could be sustainably extracted. Using the 1992 drought year data, the study calculated the recharge fell between 2,800 af and 10,500 af and recommended that only 2,000 af be withdrawn during drought years. Based on that study, there is plenty of groundwater for MMSA to be able to increase their pumping. However, if the MCWD needs to tap the Dry Creek aquifer in the future, there wouldn't be enough groundwater to meet both their needs in drought years. By monitoring the groundwater levels now and collecting data on the impacts of MMSA's snowmaking and domestic water usage on the aquifer, the USFS would be better prepared to manage the aquifer in the future.

We recommend the USFS perform periodic water quality tests on all the wells on its property and at Big Springs to monitor how much salt used on the runs is seeping into the groundwater. A USGS study of the tributaries to the San Joaquin River and springs in the Devils Postpile states that MMSA applies an average of 120,000 lbs/yr of salt to the ski area. That USGS study identified salt in the Upper Dry Creek groundwater along with emerging contaminants e.g. caffeine, sunscreen chemicals, DEET⁶. Using water from the ponds year in and out increases the salinity of the ponds. With increased recycling of groundwater pumping-snowmelt-recharge, would these chemicals become more concentrated?

Greenhouse Gas Creep

Reducing the world's carbon footprint is a very high priority for the Sierra Club. Global warming threatens the biodiversity of this planet. To address this issue, California has set goals to be carbon neutral by 2045 (EO B-55-18-2018) and to reduce carbon emissions 40% below 1990 levels by 2030 (SB32 2006). MMSA needs to help "Save the Snow" and should help meet the state's goal.

⁶ <https://pubs.usgs.gov/sir/2017/5048/sir20175048.pdf>



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The EA states that GHG emissions during construction and long-term would be negligible, but it does not state how many tonnes of carbon these projects will add to the atmosphere. A 43% increase in snowmaking will not be an insignificant increase in electricity. The argument that this project would add a small amount of GHGs relative to what the whole ongoing business emits is an excuse used to continue doing business as usual while intensifying use and cumulative impacts. Construction will use equipment that runs on diesel and long-term operations will use electricity that has a 54% fossil fuel mix⁷. How is ignoring this increase in fossil fuels helping? It is irresponsible to continuously increase them, no matter how small the project is. Climate change is affecting the world now and we have only ten years to keep the impact within livable levels.

We appreciate that MMSA will use better technology that will use less electricity to make snow. Yet, the water still needs to be pumped uphill and the air still needs to be compressed for snowmaking. The zip and mountain coasters, their riders and the tubes for sledding will need to be pulled up hill consuming electricity. Will the existing snowmaking equipment/snow guns be upgraded as well with more efficient air compressing pumps?

The EA doesn't provide much detail about the lodge that is planned for Woolly's Adventure Summit. Will it be all-electric? Will it have solar panels? Will it be LEED certified?

MMSA uses a tremendous amount of electricity (5-6 MW) to run the ski lifts. This project will only add to that huge power load. MMSA could buy green power from SCE, it could buy carbon offsets, it could buy geothermal power from Ormat and/or it could install solar or micro wind turbines and make power. This and every project is an opportunity for MMSA to showcase how to achieve a net zero carbon footprint. What is MMSA's plan to meet California's goals?

While we understand MMSA is trying to find creative ways to maintain or grow its visitor revenues as it adapts to climate change, we urge MMSA to help fight climate change as well. Every decision should be made with that in mind. Every effort should be made to get to a net zero carbon footprint.

Sincerely,

Lynn Boulton, Chair
Range of Light Group, Toiyabe Chapter
Sierra Club

⁷ Per the 2017 Content Label, SCE uses 32% eligible renewable energy and 54% comes from fossil fuels



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Looking into the forest where the ropes courses would be just above the tubing area.