May 9, 2019

Regional Forester USFS
Att: Stanislaus NF OSV usage/designation project
1323 Club Drive
Vallejo, CA 94592

Re: Stanislaus NF OSV usage/designation objection

Dear Mr. Moore:

Please accept this correspondence as the Objection of the Off-Road Business Association ("ORBA") and the California-Nevada Snowmobile Association ("CNSA") with regard to the above Stanislaus National Forests ("SNF") OSV usage and designation proposal issued by Jason Kuiken, Forest Supervisor dated March 22, 2019. The Organizations are filing this objection challenging: 1. Conflicts of management decisions with best available science on both compacted and uncompacted snow; 2. Management standards proposed for the PCT footprint and adjacent areas; 3. The growing conflicts in decision making between the Stanislaus and adjacent forests on basic issues such as snow depths; and 4. The use of dates to trigger OSV travel without addressing minimum snowfall amounts.

The Organizations have also included extensive additional research around the behavior of various types of snow under a range of forces that was not available to us at earlier stages of this effort and we have consolidated this research into four general categories. These four categories are snow compacted by man; 2. Snow compacted by natural forces; 3. Uncompacted snow subjected to high pressure vehicles; and 4. Uncompacted snow subjected to low pressure vehicles. We hope this new information is helpful.

1a. Research regarding manmade groomed snow behavior from decades of Army Corp of Engineers.

Since the submission of the comments regarding the original version of the Stanislaus OSV plan, the Organizations have continued to investigate the scientific analysis that has been previously conducted regarding the application of force to snow in both an uncompacted and compacted nature. While this process has been long and costly to undertake, this research has also been highly fruitful as it yielded a large body of work from the Army Corp of Engineers regarding activities they have been conducting in the Antarctic

continent since the 1940's.[1] It is significant to note that while the research methodology and management standards have dramatically evolved over the life of this research, the basic conclusions have remained highly consistent over time, mainly that snow is a highly effective buffer of force. Unfortunately, snowmobiles were found early in research process to not meet the purpose and need of the project due to their inability to carry large amounts of cargo, inability to start in exceptionally low temperatures, and that sleds were generally unstable. [2] As a result, this research can provide a lot of general information of varying relevance but cannot directly answer the questions around winter travel of OSVs.

The value and credibility of much of the Army Corp work and information to the US Government cannot be overstated as much of the information was deemed to be "CLASSIFIED" when it was developed in the 1940s and 1950's[3] and the classification of this research continued into the 1980's. Clearly if there were concerns about the basic accuracy or integrity of the information such a determination would not be warranted. Much of the research and activity on the Antarctic Continent has been the subject of similar or higher levels of conflict and scrutiny as USFS OSV planning efforts have been, again speaking to the veracity of any of the conclusions reached. It is also important to note that while this research has been occurring for more than 75 years, there has been little question or controversy around the scientific method used to reach the conclusions regarding groomed snow or the conclusions regarding the ability of groomed snow to absorb force. After being declassified, much of this information has been subjected to additional rounds of publication and review.

Prior to addressing the conclusions of this research, the Organizations believe it is critically important for USFS managers to understand the strict management guidelines in place for any activity on the Antarctica Continent and to recognize that any actions in Antarctica are managed to a "zero impacts" standard for activity. This is far stricter when compared to the multiple use management requirements that are the management goals and objectives of the USFS. Pursuant to paragraph 1 of Article 3 of the 1959 Antarctic Treaty as amended[4] (Hereinafter referred to as "The Treaty") all actions on the Antarctic Continent are subject to the following management standard:

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[1] For a complete summary of the more than 75 years of research that has been performed by the Army Corps of Engineers please see Shaprio et al; *Snow Mechanics; A Review of the State of Knowledge and applications*; US Army Corps of Engineers CRREL Report 97-3 August 1997.

[2] *See*, Blaisdell et al; *First International Conference on Winter Vehicle Mobility*; US Army Corps of Engineers; Special Report 93-17 (July 1993) at pg. 91

[3] A partial copy of foundational research from 1948 and 1952 are attached as Exhibit "1". Complete copies of these works are available but have not been included with this objection as the conclusions are addressed in subsequent works identified in the objection with far greater detail.

[4] A complete copy of this treaty has been enclosed for your reference as Exhibit "2".

> "The protection of the Antarctic environment and dependent and associated ecosystems and the intrinsic value of Antarctica, including its wilderness and aesthetic values and its value as an area for the conduct of scientific research, in particular research essential to understanding the global environment, shall be fundamental considerations in the planning and conduct of all activities in the Antarctic Treaty area."

The remainder of Article 3 of the Treaty provides a detailed process to apply the zero-impact standard to the wide range of actions occurring on the Antarctic Continent. It is also significant to note that pursuant to Article 8 of the Treaty, all actions on the continent are fully subject to NEPA planning requirements to insure there are zero resource impacts to the Antarctic Continent. As a result, any actions that are taken on the Antarctic Continent are fully subject to NEPA requirements and are managed to a much stricter zero impacts standard than USFS efforts multiple use requirements for OSV.

In the following portions of this objection, the Organizations are not attempting to provide a complete review of the Army Corp of Engineers research, as such documentation would necessitate the use of a large capacity jump drive. Rather the Organizations are attempting to summarize the most up to date information in particular areas or subjects. Much of the Army Corp of Engineers research efforts centered around the operation of high-pressure vehicles on snow, such as large military transport planes and transport vans as the cost-effective movement of supplies and other resources needed for Antarctic research has been a significant hurdle for researchers. Army Corps research on the ability of compacted snow to provide a suitable landing surface for a wheeled C141 transport plane provided the following conclusions:

> "Present studies indicate that this type of processing is needed for only the top 25 cm of a cold, dry processed base course in order to land wheeled C141 and other similar large whether or not an additive such as sawdust is really needed for the base course. Depth processing the snow with a snow miller, in combination with water or heat injection (or dynamic compaction of the top layer), may be adequate."[5]

Subsequent research performed by the Army Corp concluded that snow compacted with the utilization of snow grooming equipment, which is almost identical to the equipment currently used on the Stanislaus and throughout the country for preparation of snowmobile trails, was the most cost-effective manner to prepare compacted snow. The subsequent research by the Army Corps provided significantly greater detail regarding

[5] *See,* Lee et al; *Improving snow roads and airstrips in Antarctica*; US Army Corps of Engineers Special Report 89-22 (July 1989) at pg. 17. A copy of this research is enclosed as Exhibit 3 to this objection.

the levels of force being applied to the snow as part of the landing of wheeled C-130 and C-141 aircraft on the prepared snow, which are as follows:

> "For a snow road or a snow runway to be feasible, a method of snow processing is needed such that the resulting snow pavement attains a strength that can support tire pressures in the range of 690kPA. Most cargo-carrying vehicles can easily be equipped to operate with tire pressures at or below 690 kPa and the C130 Hercules tire pressures normally ranges from 550 kPa to 690 kPa. Ideally, a snow strength that could support r1380 kPa would be desirable since that would allow the operation of essentially any conventional surface vehicle or cargo plane."[6]

The conclusions of this Army Corp research regarding the effectiveness of 25 cm of groomed snow to absorb the forces of landing a wheeled C130 or C141 were as follows:

> "This snow maintained a strength between 3000 and 7000 kPA throughout the course of our 12-week study. This strength is more than suitable for the support of heavy wheeled vehicles and aircraft that typically do not require more than 1000 kPa strength." [7]

There appears to have been no criticism of the Army Corps 1997 research and this unanimity of research community around these conclusions was exemplified by the fact the conclusions of this research were again the basis of further analysis and review in 2017. It is significant to note that the conclusions of the earlier works were not questioned in any manner and there was no discussion of concerns around the original conclusions after more more than 10 years of landing of high-pressure aircraft and use of high pressure wheeled vehicles on the groomed snow surface. [8] It was accepted that 25 cm of snow provided that level of resource protection.

It is uncontested that OSV usage averages 5 kPa of force on the snow, even under worst case scenarios. Given the clear conclusions decades of Army Corps of Engineers research concluding that 25 cm of groomed snow can support 300 to 1,400 times the amount of force applied by a snowmobile for prolonged periods of time, the Organizations are opposed to any increase in depth requirements for commencement of grooming operations of snow on the basis of resource protection.

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[6] *See*, Lang et al; *Processing snow for high strength roads and runways*; Journal of Cold Regions Science and Technology 25 (1997) at pg. 18.

[7] *Supra* note 5 at pg. 29

[8] *See*, White et al; *Review of ice and snow runway pavements*; International Journal of Pavement Research and Technology 11 (2018) 311-320.

1b. Snow compaction via natural forces occurs throughout the world and results in material density similar to asphalt.

The Organizations are also aware that developing a complete understanding of snow compaction, both from natural processes and recreational activity, has been a significant factor in allowing OSV travel on roads and trails with lower amounts of snow on Forests adjacent to the Stanislaus. For reasons that are never identified, these conclusions and research simply are not addressed on the Stanislaus, which provides a blanket 12-inch standard for all usage and requires 24 inches for access to some areas. Usage of summer routes and roads allows for use earlier in the year, when snow is naturally compacted and resource risks are minimal due to the fact the usage is only allowed on designated roads and trails. These types of opportunities are important to the OSV community due to the fact riders may be new to the sport, breaking in new equipment or simply ensuring that their existing equipment is performing properly and can be used safely in deeper snow situations.

There is an exceptionally well-developed body of research regarding snow compaction from natural processes, a process which is commonly identified as snow sintering or snow metamorphosis. This large body of research is most directly targeting avalanche safety but also is directly involved with issues such as large construction projects on snow such as roads or mines, the monitoring of polar ice cap activity with satellites[9], flooding in high alpine communities and the advancements in the construction of ice breaking vessels. The Organizations assert that snow compaction is the same regardless of what natural force is compacted and the conclusions of research should be the same regardless of what continent the research is performed on.

In this portion of our objection, the Organizations are not seeking to provide a complete outline of this rapidly developing snow science body of research that has resulted from the avalanche research community generally. In order to provide a complete review of this evolving body of global knowledge the Organizations have enclosed a complete copy of the 2016 textbook entitled *"Snow and Ice Related Hazards, Risks and Disasters"* edited by Wilfried Haeberli as an Exhibit to the comments/protest previously submitted to your office regarding the Eldorado NF OSV and was previously provide to the Stanislaus NF in previous comments. We hope that resource remains available as it was obtained at significant cost. Collectively referred to as the "Haeberli Text" in this objection. Generally, Chapters 2 through 4 of the text provide an introduction to the

[9] *See*, Arthern et al; *In situ measurements of Antarctic snow compaction compared with predictions of models;* JOURNAL OF GEOPHYSICAL RESEARCH, VOL. 115, F03011, doi:10.1029/2009JF001306, 2010

compelling body of work that now supports snow sintering and metamorphosis and significant data that clearly can be relied on in defense of the varying snowfall totals based on surfaces under the snow and explaining why current management has been so successful. While this text has only become publicly available recently, this text appears to be the most complete peer reviewed body of work on this issue and represents a consolidation of an enormous number of articles from globally recognized leaders in snow science.

This global summary of snow science research starts with the recognition that:

> "Once deposited on the Earth's surface, snow and fin density increases through metamorphism, eventually approaching the density of ice. Metamorphism is a combination of both physical and thermal properties of snow." [10]

Snow scientists recognize that sintering alters snow significantly, which is summarized as follows:

> "New snow generally has the lowest densities with about 100 kg/m -3 and densities increase with aging snowpack due to metamorphism to about 350-400 kg/m -3 for dry old snow and up to 500 kg/m -3 for wet old snow." [11]

The researchers investigating snow compaction in relation to developed ski areas have also addressed this issue and found that fallen/existing snow is subjected to additional snow load on top of the compacted snow densities continue to increase. Why is the ongoing sintering or metamorphosis process an issue for the downhill ski community? The industry is trying to resolve the problem of skiers catching an edge on a ski run, which at best provides for a lower quality skiing experience for users and can also result in serious injury or death to skiers if an edge is caught at the wrong time or locations or occurs under competition conditions. The conclusions of this long-term snow compaction research for developed ski areas are outlined as follows:

> "Fresh fallen snow has a low density, <100 kg/m3. The snow is a mixture of solid snow crystals, liquid water and gaseous air. Over time it is compacted by wind. Snow crystals are sintered by daily temperature variations. The snow loses most of its gaseous and liquid content and,

[10] *See*, Haeberli at pg. 38.
[11] *See*, Haeberli et al at pg. 101.

because of this, snow densities rise to 100–500 kg/m3. After a long time, snow converts to firn (500–800 kg/m3) and, under the load of newer snow, it even transforms to ice (917 kgm3)."[12]

Given that best available science clearly concludes that the impacts of natural processes, such as wind, sun and gravity, can compact snow to a density of 5 to 9 times what the density of uncompacted snow, the Organizations submit that such a factor MUST be addressed in any scientific research that might be identified as the basis for management changes. The Organizations would also note that these natural factors of compaction have been accurately addressed in current snow depth requirements as there is no allegation of resource impacts being made in the Proposal despite OSV travel occurring on the Stanislaus NF for almost 50 years. While there may not have been a complete understanding of the scientific basis for these conclusions when OSV management standards were originally developed, clearly the managers understood the issue and achieved proper management standards.

The scientific conclusions that the natural compaction of fallen snow results in snow density levels of 500-917 kg/m3 is significant for other reasons as well. These conclusions become more compelling when this density is compared to many other common road and construction materials as many land managers are far more familiar with the highly rigid behavior of these materials when forces are applied to them. By comparison, the average weight and density of common building materials for roads and skyscrapers hundreds of stories tall is as follows:

Material	**Density kg/cubic meter**
Compacted Snow	500-917
Asphalt[13]	712
Cement	1,400
Lightweight Concrete [14]	1,700

The relationship of the density of compacted snow and asphalt cannot be overlooked as this comparison adds good context to the levels of protection from possible OSV impacts to resources that is provided by compacting snow. This information also provides scientific context and defensibility to explain why current

[12] See, Mossner et al; *Measurement of mechanical Properties of snow for the simulation of skiing*; Journal of Glaciology, Vol 59, No 218 2013 at pg. 2013. *See Also*, Fauvre et al; *Optimal Preparation of Alpine Ski Runs*; Proceedings of the 2004 International Snow Science Workshop, Jackson Hole, Wyoming; University of Montana; 2004.

[13] *See*, https://theconstructor.org/building/density-construction-materials/13531/ for values of asphalt and cement

[14] *See*, https://hypertextbook.com/facts/1999/KatrinaJones.shtml for density of lightweight concrete

management is effective in protecting resources. While land managers are very familiar with the performance of asphalt roads in avoiding contact with resources that might be under that roadway often their experiences with snow are very limited. Given that the average road appears to receive 2-3 inches of asphalt with 4-6 inches of base under it to support motor vehicle traffic that commonly approaches 80,000 lbs. for a commercial motor vehicle on the asphalt for decades, even a minimal amount of compacted snow is sufficient to provide resource protection at levels very similar to asphalt when forces of an OSV are applied.

The relationship between the weight of compacted snow and asphalt cannot be overlooked in determining what is sufficient snow and what levels of resource protection are provided by snow from the time it falls to the times when it is fully compacted. Given that a snowmobile only applies .5 lbs. per inch on the snow or 5 kPa, while natural processes result in pressures many hundreds of times that of an OSV clearly the significant factors identified above must be addressed in any research addressing additional impacts to compacted snow from OSV travel. Additionally, the similarity in weight of snow and asphalt gives rise to another question, mainly if resources can survive the hundreds of Kg of pressure on them that can result from a meter of snow being on them, why would the .5psi of pressure from an OSV be a concern? Often these resources are buried under several meters of compacted snow for extended periods of time and emerge from the burial in the spring without issue. Several meters of compacted snow can easily result in sustained pressures on any resource of tons of force for many months drawing concerns about snow compaction into further question.

While not as developed to the research and analysis levels referenced above, the Organizations believe the position of the downhill ski industry regarding the impacts of snow sintering or metamorphosis is also very important to this discussion as the downhill ski industry has developed extensive technologies to improve mechanical grooming of downhill ski runs to address the continued impacts of sintering after the initial grooming of ski runs.[15] These technologies are relevant to this discussion as downhill ski grooming and snowmobile trail grooming occur with the same pieces of equipment and there is no question that the sintering process continues after the grooming has completed. Asserting that sintering does not continue after grooming simply is not an option in the skiing or avalanche community, and the Organizations believe this compaction is equally relevant in the OSV world as a result of natural processes snow compacts into stronger and stronger layers and into layers that are far more compacted that could ever result from OSV traveling over

[15] For a representation of this technology please see https://www.prinoth.com/fileadmin/user_upload/pdf/prinoth_snowdepthmeasurement_EN_NA_01.pdf

the snow. The Organizations believe this compaction provides continued protection for resources even after the depth of snow from a storm has ended and has been compacted.

1c. Snow sintering/natural snow compaction has already been recognized as a natural process in best available science by the USFS.

As discussed above, there is a huge body of work now available that clearly identifies the impacts of natural processes such as gravitational, thermal and physical forces on snow over time and conclude that these factors can significantly improve the ability of the snow buffer between recreation and any resource to function. This type of protection is significant in allowing OSV usage on roads and trails with lower amounts of snow that is often the result of compaction. The Organizations would also note that the failure to address the natural forces resulting in snow compaction directly conflicts with best available science identified by land managers. The USFS, USFWS and BLM experts have concluded this by clearly stating as follows:

> "Snow compaction in the Southern Rocky Mountain region is frequently a result of natural process and not recreational usage;"[16]

Given that the natural process causing the compaction of snow has already been recognized as best available science on what is a natural process occurring throughout the world, the Organizations must question how research can be identified as best available science on any issue involving snow depth without addressing this factor in some manner. The Organizations submit that best available science brings new information and understanding to allow managers to explain why current management of OSV travel on the Stanislaus NF has been effective rather than providing the basis for change of this management.

Resolution of Objection #1

Best available science must be applied to allow for OSV usage on roads and trails recognized in summer travel management as significantly smaller amounts of groomed snow are sufficient for resource protection in these areas as these areas are important recreational corridors for usage of areas with deeper snow and will bring the Stanislaus into a consistent position with adjacent forest OSV decisions.

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[16] *See,* Interagency Lynx Biology Team. 2013. *Canada lynx conservation assessment and strategy.* 3rd edition. USDA Forest Service, USDI Fish and Wildlife Service, USDI Bureau of Land Management, and USDI National Park Service. Forest Service Publication R1-13-19, Missoula, MT. at pg. 26.

2a. Research addressing behavior of high-pressure vehicles in uncompacted snow from Army Corps of Engineers.

The Organizations would also like to address Army Corp research regarding the use of high-pressure vehicles on uncompacted snow. While the specific conclusions of this research are not relevant to these discussions regarding the use of low-pressure vehicles, the recognition of several basic facts are important to the discussion. Army Corp researchers concluded that comparatively high levels of force resulting from wheeled vehicle usage over small areas of uncompacted found that could be modeled for both hard snow and soft snow using the Capped Drucker-Page model.[17] Similar modeling could also be developed for exceptionally small amounts of force being applied to thin layers of snow.[18] Army Corp and other researchers also accepted the fact that expanding the foot print of the vehicle reduced the pressure applied to the snow. While the conclusions are clearly not dispositive to the OSV travel questions due to the exceptionally large and small scales the work was performed at, the fact that snow density can be modeled consistently is significant to recognize as USFS efforts have been applying such a model on the ground for years to avoid possible impacts to resources. Such modeling is clearly possible and scientifically valid as a management tool and would support the conclusions of the 35 or more years of OSV management on the Stanislaus, mainly that snow is a highly effective buffer between recreational activity and resources under the snow.

2b. Behavior of low-pressure vehicles in uncompacted snow.

The Organizations are intimately aware that the behavior of snow and the snow buffer between resources and recreational activity will vary greatly throughout the country due to variations in snow density and rates of natural compaction. Uncompacted Rocky Mountains snow is VERY light and dry and compacts to a dense form of snow while snowfall in California or the Northeast often falls as dense, heavy wet snow and is very similar to heavily compacted snow in other locations in the country. The variations in density over time and geographic location may impact the amount of snow necessary to adequately protect resources. This situation has provided a difficult question to land managers developing OSV plans, mainly what is sufficient snowfall for protection of resources?

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[17] *See,* Haehnel et al; *A Macroscale model for low density snow subjected to rapid loading*; Cold Regions Science and Technology 40(2004) 193-211. *See also,* Richmond et al; *A macroscopic view of snow deformation under a vehicle*; Army Corp of Engineers Special Report 81-17. July 1981.

[18] *See,* Huang et al; *Mechanical properties of snow using indentation tests; size effects*; Journal of Glaciology; vol 59 No 213 (2013)

While the specific answer to the question of minimum uncompacted snowfall at a location necessary for resource protection does not appear to have been scientifically concluded at this time, there is a large body of high-quality research that has been developed by those researching snow characteristics and recreational activities in relation to avalanche activity. Some of these works have addressed the levels of force that snow applies to resources under the snow and have measured the transmission of physical forces through snow with high levels of specificity and detail in order to more fully understand how avalanches are triggered. While this information is not dispositive on minimum snowfall, many of the conclusions are highly valuable in understanding the effects of natural forces on snow and how recreational activities relate to these natural forces. The conclusions of this research directly conflict with any conclusion of a minimum of 12 inches of snow is required to protect resources.

A compelling body of work has generally originated out of the University of Calgary and has been driven by Professor Bruce Jamieson who has researched the behavior of uncompacted snow in the development and actions of avalanches for more than 2 decades in the Canadian Rockies. The Organizations would like to direct USFS to a series of three studies Mr. Jamieson conducted with Scott Thumlert and several others, published in the *Journal of Cold Regions Science and Technologies,* which for purposes of this document will be referred to as the "Jamieson/Thumlert" studies. Copies of each of these research documents have been included with this objection for your convenience as Exhibit "5". The Jamieson/Thumlert studies were generally in light snow as the densities were 191 kg/m3, 203 kg/m3 and 219 kg/m3, respectively (averaged for the top 90 cm) and as a result are addressing snow densities that are simply unheard of on the Stanislaus NF but in later stages of the research, the scope was expanded in include more compacted/multilayer snow in the research process. In this research, snowmobiles climbing a hill under full throttle and skiers were traversing down the same hill were measured and factors such as snow displacement were incorporated into the analysis. This research concluded:

> "**the static stresses applied to the surface of a mountain snow cover are similar for a typical skier (2.6 kPa, from 85 kg skier, 0.32 m2 area) compared to a typical snowmobile (3.8 kPa, from 350 kg machine and rider, 0.9 m2 area).** The fact that the magnitude of stress added to the snow cover should be similar for skiers and snowmobiles was further evidenced in Fig. 5

which showed stress vs. effective depth. There is no substantial difference between the fitted curves for the skier and snowmobile data."[19]

A variety of testing processes were used over the three years started with skiers simply skiing over the test areas and advancing to skiers falling onto the testing areas and snowmobiles simply traveling over the area to snowmobiles jumping onto the test area or climbing uphill in the test area to simulate worst case scenario conditions. Video available for their research process here.[20] While the Jamieson/Thumlert studies provide ground breaking information into low pressure snowmobiles and skiers for application of force on snow, the scale or context of the work is difficult to apply for the creation of management decisions as the works are more targeted at how these minimal forces are related to avalanche triggering rather than application of force on flat ground. The concerns around the levels of force necessary to trigger avalanches is simply much lower levels of force than the levels of force that would result in resource impacts but this research provides additional context and understanding into the movement of force through various depths of uncompacted snow and how the effectiveness of snow as a buffer improves as the snow compacts naturally.

While the conclusions of the Jamieson/Thumlert series of works are valuable alone as it is precedent setting nature of the dynamic measurement of force on snow from OSV/skier travel, these works are complex and difficult to place in a context for comparison. Earlier works of Bruce Jamieson with Brown provide good context for comparison of the Jamieson/Thumlert conclusions, as these earlier works provide conclusions around generalized force from compacted snow on materials under the snow. This earlier research provides as follows:

"Figure 7 illustrates the response of weak layer shear strength to increasing overlying load due to continued snowfall. The weak layer deposited on 16 January had an initial shear strength of 195 Pa and strengthened over 9 days to 1532 Pa (Fig. 7a). **Overlying load increased by 196 Pa during the same interval. For the layer deposited on 21 February, Figure 7b shows shear strength and load increasing by 403 and 216 Pa, respectively over 5 days.**

For three separate time series measured shear strength is plotted against the overlying load (Fig. 8). At each observation snowfall had increased the load and strengthening in the weak layer was measured. **In all three cases strength is positively correlated with load (Fig. 8; Table**

[19] *See,* Thumlert/Jamieson et al; *Measurements of localized dynamic loading in a mountain snow cover;* Journal of Cold Regions Science and Technology; Vol 85 ed 94-101; 2013 at pg. 99 emphasis added.

[20] See, https://vimeo.com/20563669

2). The average loading rate and average strengthening rate varied for each time series resulting in different slopes of linear trend lines fit to the data."[21]

The data set for the above conclusions is provided in the following charts:

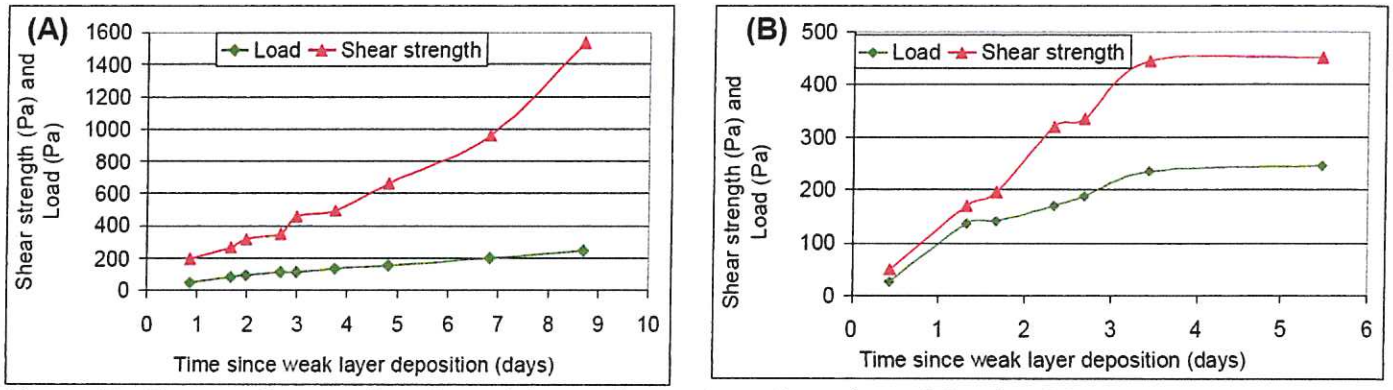

*Figure 7. Time series graphs of weak layer shear strength and overlying load for two separate weak layers: **(A)** layer deposited on 16 January 2006 was 10 mm thick, consisting of stellar crystals (1-2 mm) and decomposing fragments (1-2 mm), and had an initial (measured) and final (estimated) density of 56 and 188 kg/m^3 respectively, **(B)** layer deposited on 21 February 2006, with an initial and final measured density of 38 and 135 kg/m^3 respectively, was 45 mm thick at time of deposition and consisted of stellar crystals (1-3 mm). Markers represent an average of 12 measurements made at each observation.*

When the conclusions of the Jamieson/Thumlert works, mainly that skiers apply 2.6 kPa and snowmobiles apply on average 3.8kPa of force on the snow, is compared to the conclusions of the 2006 Brown/Jamieson research, mainly that natural snow compaction results in between 196 kPa and 216 kPa the conclusions are highly valuable and provide highly valuable conclusions in terms of scale of forces being applied. This research was also invaluable in understanding how snow is a more effective buffer as time and natural forces are applied to the uncompacted snow. When the force of an OSV or skier through minimal amounts of snow is compared to the force of the snow on the ground, the conclusion is that the snow provides almost 50 times more force on the ground than an OSV. While this is not dispositive for management, the fact that natural resources commonly survive application of forces averaging 50 times more than an OSV applies through minimal amounts of snow is highly valuable. This information is being provided to allow for a more detailed analysis and understanding of why current management has been effective in resource protection and why lesser amounts of snow may be permitted in certain circumstances, such as use of OSVs on developed roads and trails.

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[21] *See*, Brown & Jamieson; *Evolving Shear Strength, stability and snowpack properties in storm snow*; Proceedings of the International Snow Sciences Workshop 2006 Telluride Colorado at pg. 15. (Emphasis added.) A complete copy of this research has been included with these Objection as Exhibit "6"

Resolution objection Issue #1b

Adopt separate uncompacted snowfall depths for on and off trail usage that are supported by best available science conclusions that snow is a highly effective buffer of force and recognize that snow compacts naturally and this compaction results in greater resource protection than uncompacted snow in the planning process.

2. Conflict between OSV management standards on adjacent USFS management units.

The Organizations second objection involves the growing conflict of numerous OSV management standards being developed in plans being developed at functionally the same time when forests that are immediately adjacent to each other are compared to one another. It has been the Organizations experience that often-recreational users of public lands are not aware of the specific ownership of most locations they are using for recreation, especially when there are numerous administrative boundaries present in the same recreational areas. Users simply recreate rather than worry about if they are on USFS, BLM, State Forests or local lands. The conflicts that result from these boundaries has been a frequent basis of frustration for the public seeking to use public lands for a wide range of activities, ranging from basic recreation to the utilization of public lands for permitted business activities. It has been our experience that successful management of any area where there are multiple land management agencies involved is contingent upon consistent management standards across the management agencies which allows for meaningful education of the public regarding allowed and prohibited activities in the area and avoiding the appearance that management standards are arbitrary. Here the USFS is the sole manager of these areas and the USFS is creating a management challenge for themselves by adopting conflicting management standards for similar activities.

Our concerns about these types of basic management decision conflicts is compounded by the fact that most lands in the Stanislaus geographic region are under USFS management and we would be asking users to understand boundaries at a far more detailed geographic level than just management between agencies, which we already know is problematic. Here these conflicts would require users to understand boundaries of forests despite the fact the user's activity is not changing. The basic consistency of management standards will be critical: 1. Education of the users regarding when particular areas are open to particular usages; 2. to the enforcement of any standards; and 3. the defense the scientific basis of any of these decisions moving forward.

The known conflicts between OSV management decisions on adjacent forests currently in OSV planning would be exemplified by the fact:

1. Stanislaus NF excludes usages of an OSV below 3,500 ft [22] while the Eldorado NF excludes OSV usage below 4,000 ft.[23]

2. Stanislaus NF requires 12 inches of moderate to heavy uncompacted snow for off trail usage and 6 inches of any snow for use on a groomed route, while the Eldorado requires 12 inches for all usages.[24] Unfortunately when the standards on other forests such as the Lassen are compared the conflict expands as the Lassen requires 6 inches for use on a road and allows less with monitoring to avoid resource impacts and requires 12 inches of any type of snow for off trail usage.[25]

3. The Stanislaus NF proposes to manage areas based on dates on a calendar, which is inconsistent with all adjacent forests in the area.

Our concern is that while these may appear to be minimal ministerial issues at this point, these types of conflict make any decision appear horribly arbitrary should there be a legal challenge to these decisions but also will directly create user conflicts and confusions for users given the immediately adjacent nature of these forests. The Organizations can not surmise how these types of conflicts could be managed in areas like the LTBMU.

The Organizations would also note that the basic coordination of these types of standards has been identified by the USFS as a major goal of their 2016 Strategy for a Sustainable Trail System as reflected in Challenges number 5 and 6 identified in the Strategy. Challenge #5 is identified in the 2016 strategy as follows:

> **"Challenge:** The Forest Service faces barriers, both perceived and real, to effectively partnering and managing sustainable trail systems.
> **Aspiration:** Agency leaders, employees, and partners collectively understand the intent and latitude of laws, regulations, and policies. They use streamlined processes and innovative methods to collaboratively partner in stewarding a sustainable trail system.
> **Actions:**
> 5.1 **Remove Barriers:** Identify and overcome real and perceived barriers to effective partnering and to using nontraditional funding sources, including providing improved communication, additional guidance for discretion in decision-making, and related training.
>
> 5.2 **Provide Efficiency Tools:** Identify and develop institutional tools that actively support effective partnering—including technical guides, standardized templates, and readily available training materials.
>
> 5.3 **Apply Cross-Program Integration:** Identify opportunities to actively integrate between agency program areas to meet trail restoration and stewardship objectives.

[22] See, USFS Stanislaus NF OSV plan FEIS at pg. 206.
[23] See, USFS Eldorado NF OSV Plan FEIS at pg. 22.
[24] See, USFS Eldorado NF OSV plan ROD at pg. 4.
[25] See, USFS Lassen NF OSV ROD at pg. 2.

5.4 **Establish Community of Practice:** Collaboratively share successes, creative solutions, best practices, and tools through a trails community of practice and network of shared knowledge."[26]

Challenge #6 is identified in the 2016 strategy as follows:

> **"Challenge:** Trail information is incomplete, not consistently available or easily accessed, and does not fully meet the needs of the public or of Forest Service field personnel and managers.
> **Aspiration:** Trail information is current, available, useful, and used by many people.
> **Actions:**
> 6.1 **Integrate Shared Data Collection and Use:** With partners and trail users, champion an integrated approach to collect and share trail data and information that better serve the public, emphasizing open data, citizen science, and other contemporary approaches.
>
> 6.2 **Improve Data Tools:** Update and streamline agency trail databases, requirements, and management tools to efficiently meet public, partner, and agency trail information needs.
>
> 6.3 **Meet Data Standards:** Meet minimum standards of trail information on all Forest Service units, including accurate and readily available trail spatial data."[27]

The Organizations believe that the conflict between basic management standards for OSV travel across management boundaries that is now being proposed by the California forests and the goals and objectives of this national USFS effort are immediately apparent. Here the USFS has the opportunity to avoid creating conflicting management standards which will result in major barriers to the long-term management of these areas. This conflict simply must be avoided now rather than trying to be resolved at some point in the future.

Objection resolution #2

Undertake a complete review to ensure that basic standards are consistent across adjacent forests and based on best available science and are not creating barriers to the effective management of public lands and permitted activities.

3. Management of the PCT footprint and adjacent areas must comply with current federal law.

Objection issue three addresses usage of motorized vehicles on the Pacific Crest Trail ("PCT") and in areas adjacent to the PCT and the application of the NTSA in conjunction with FLPMA and other forest management statutes. The Organizations vigorously support the Lassen ROD recognition that visitation is very low and that the PCTA recommends against use of the trail in the winter time[28], rendering the idea of a corridor/crossing points or crossing points valueless to non-motorized usage on the ground. The Organizations would be opposed to any discussions that would reintroduce the concept of exclusionary corridor/crossing points in the

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[26] *See,* USDA Forest Service; *National Strategy for a Sustainable Trail System*; December 30, 2016 at pg. 9
[27] *See,* USDA Forest Service; *National Strategy for a Sustainable Trail System*; December 30, 2016 at pg. 10.
[28] *See,* USDA Forest Service, Lassen NF, Draft ROD March 2018 at pg. 7.

discussion. Rather than applying the clear direction of the current version of the NTSA, which clearly identifies the multiple use mandate being applicable to the trail, the Stanislaus planners start from the position that:

> "The Decision still prohibits OSV use on the PCT pursuant to the National Trails System Act of 1968."[29]

This naked assertion of closure is not supported in any way in the ROD or EIS and fails to apply the entirety of the NTSA provisions requiring usage of motorized vehicles in certain areas and closure in other areas. The Organizations are frustrated by this interpretation as the NTSA clearly spells out one of the foundational tenants of the USFS management, mainly the multiple use mandate, which for reasons that remain unclear is not recognized by the USFS. This objection requests that multiple use requirements for the PCT be recognized and the PCT be managed in accordance with multiple use requirements.

Prior to moving forward into discussion of the apparently conflicting provisions of the NTSA regarding usage, the Organizations believe a review of one of the foundational canons of statutory interpretation is needed as the PCT management is directly governed by the National Trails System Act. In 1850, the US Supreme Court stated the following foundational concept of statutory interpretation as follows:

> "In expounding a statute, we must not be guided by a single sentence or member of a sentence, but look to the provisions of the whole law, and to its object and policy."[30]

The US Supreme Court recently reaffirmed this basic tenant of statutory construction as follows:

> "Statutory construction ... is a holistic endeavor. A provision that may seem ambiguous in isolation is often clarified by the remainder of the statutory scheme—because the same terminology is used elsewhere in a context that makes its meaning clear, or because only one of the permissible meanings produces a substantive effect that is compatible with the rest of the law."[31]

The Organizations urge the USFS to look at the entirety of the NTSA, recognize the application of the multiple use mandates in the provisions governing these routes, and revise the Decision in a manner that reflects the

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[29] See USDA Forest Service, Stanislaus Draft ROD March 2019 at pgs. 9 and 14

[30] *See,* United States v. Boisdoré's Heirs, 49 U.S. (8 How.) 113, 122 (1850).

[31] *See,* Green v. Bock Laundry Machine Co., 490 U.S. 504, 528 (1990). For a more complete review of this issue please see, Congressional Research Services: *Statutory Interpretation: General Principals and Recent Trends*; September 24, 2014

entirety of the NTSA standards rather than seeking to apply one small portion of one provision of the NTSA in a manner that would render the rest of the NTSA irrelevant. This interpretation is a direct violation of the NTSA and basic canons of statutory interpretation that have been applied consistently for hundreds of years by US Courts.

The management of National Trail system Act routes has a long and evolving management history as the NTSA has gone through several significant amendments since adoption in 1968 and has also been impacted by the adoption of other land management legislation, such as FLPMA in 1976. FLPMA simply entirely altered the landscape of planning concepts for land management that resulted in conflicts between FLPMA concepts and the NTSA. The Organizations do not object to the fact that PL 90-543 passed in 1968 and created the NTSA did allow the concept of restrictions on usage of NTSA routes such as the Pacific Crest Trail, but would point to the fact that PL 90-543 was basically repealed and replaced in 1983 by PL 98-11, which provided far greater detail regarding the multiple use nature of the NTSA designated routes and areas adjacent to these routes. These dates are critical to understanding the conflict between the 1982 PCT plan and the 1983 amendments to the NTSA. This conflict results in extensive conflicts between the 1982 PCT Plan and existing federal law.

Designation of mandatory crossing points in open areas or exclusionary corridors conflicts with these amendments and planning for the management of the PCT at many levels. The Organizations have been surprised by the unnecessary complexity that has created by managers implementing the NTSA. We believe this result from managers desire to look at applying the NTSA at far to small a level and not recognizing Congress specifically discussed the multiple use principals governing these routes with some detail rather than merely stating the trail and adjacent areas are managed for multiple use. These are concepts that govern tens of thousands of miles of trail throughout the country under a diverse range of property ownership models and land management goals. Are there areas of the PCT that exclude motorized usages entirely? Of course, these are Congressionally designated Wilderness areas, and we would never ask to gain access to these areas. Are there areas outside the purview of the NTSA entirely? Of course, as portions of the PCT exist on private property, traverse significant townships and cross numerous major interstates. In open areas for OSV, any concept of corridor or mandatory cross points simply conflict with the current version of the NTSA. When multiple use concepts such as some areas being closed and other areas being open are applied at too fine a scale these concepts become problematic, regardless of the issues being addressed.

The Organizations are vigorously opposed to the possible loss of any open riding designations to create a crossing point on a trail open to motorized usage in an area that is otherwise an open riding area. While this section of the objection most directly addresses the Pacific Crest Trail, the Organizations believe these issues and principals are equally applicable to other trails identified in the Forest and Region. The Organizations are aware that such a non-motorized corridor/crossing point appears to comply with the mandates of the PCT Plan that was adopted in 1982. However, the PCT Plan is problematic as a planning tool as the 1982 PCT Plan heavily relied on the 1968 version of the NTSA for the standards in the PCT Plan. The 1982 PCT plan failed to recognize the impacts of the passage of the Federal Lands Policy and Management Act (FLPMA) of 1976, which clearly stated multiple usage of public lands was the standards to be managed too. While the passage of FLPMA in 1976 was significant, FLPMA never addressed the corridor/crossing point concept in the NTSA until the NTSA was amended in 1983 to reconcile the NTSA corridor/crossing point concept with FLPMA multiple use requirements. With this amendment Congress clearly and directly stated multiple use concepts were to govern lands adjacent to any NTSA designated trail. Why the 1982 PCT Plan was not amended to address direct conflicts with the 1983 Congressional amendments to the NTSA is unclear to the Organizations.

As previously noted, implementation of the 1982 PCT Plan on many issues is problematic at best with the subsequent adoption of FLPMA and Congressional actions entirely removing the corridor concept from FLPMA. In 1983 Congress passed a significant amendment to the NTSA to address management of adjacent areas around the PCT and to clarify the governance of multiple use principals of FLPMA to NTSA management. The 1983 Amendments to the NTSA removed the idea of managing adjacent lands to benefit the Congressionally designated trail and replaced this standard with the principal that the trail must be managed in conformity with multiple use designations created under FLPMA requirements and in such a manner to minimize conflicts and maximize values. Much of the comments and guidance around the NTSA amendments directly cite the PCT Plan as a partial reason for Congressional action, in addition to reconciling the conflict between the NTSA and FLPMA. The PCT Plan conflict with these statutory amendments was never resolved for reasons that remain unclear to the Organizations and as a result manager are now faced with a direct conflict between relevant management plans and federal law. Federal law simply must prevail on these issues and the relationship between the 1968 NTSA enactment, passage of FLPMA in 1976, adoption of the PCT plan in 1982 and the 1983 Congressional action reconciling the NTSA and FLPMA cannot be overlooked.

The Organizations must briefly address the management history of the Pacific Crest Trail, as the Organizations submit these principals are highly relevant to all non-motorized routes in multiple use areas and clearly

reflects the fact that Congress specifically stated multiple use goals and objectives for the trial rather than merely stating multiple use requirements govern these trails. Management of the Pacific Crest Trail is generally governed by the 1983 NTSA amendments which specifically addresses multiple usage concepts for areas adjacent to trails and how these multiple use mandates will relate to management of the Trail. The NTSA subsequent to the 1983 amendments provides in 16 USC §1246(A) as follows:

> "in selecting the rights-of-way full consideration shall be given to *minimizing the adverse effects upon the adjacent landowner or user and his operation*. *Development and management of each segment of the National Trails System shall be designed to harmonize with and complement any established multiple use plans for that specific area in order to insure continued maximum benefits from the land*."[32]

The provisions Congress inserted with the 1983 amendments to the NTSA are exceptionally clear and prohibit the concept of a corridor/crossing point around the PCT and remain in place as controlling federal law to this day. In several locations in the NTSA, proper recognition of multiple usage characteristics of any National Trail is specifically and clearly identified and motorized usages of the trail corridor/crossing point were clearly identified as acceptable. The 1983 amendments to the NTSA in 16 USC 1246 (j) provide as follows:

> "j)TYPES OF TRAIL USE ALLOWED. **Potential trail uses allowed on designated components of the national trails system may include, but are not limited to, the following: bicycling, cross-country skiing, day hiking, equestrian activities, jogging or similar fitness activities, trail biking, overnight and long-distance backpacking, snowmobiling, and surface water and underwater activities. Vehicles which may be permitted on certain trails may include, but need not be limited to, motorcycles, bicycles, four-wheel drive or all-terrain off-road vehicles.** In addition, trail access for handicapped individuals may be provided. The provisions of this subsection shall not supersede any other provisions of this chapter or other Federal laws, or any State or local laws."[33]

It is significant to note that the 16 USC 1246(j) remains in this form and controlling federal law on usage of NTSA routes to this day and that any time Congress has taken action Congressional actions have consistently

[32] *See*, 16 USC 1246 (a).
[33] *See*, 16 USC 1246 (j).

identified the desire to provide a multiple use experience on any route that is designated under the National Trails System Act.

The management of NTSA corridor/crossing points and routes has a long and sometime ambiguous management history when only Legislation is reviewed but significant clarity in Congressional intent for management of routes and corridor/crossing point/crossing points is provided with the review of Congressional reports provided around original passage of the NTSA in 1968. Multiple uses of corridor/crossing points and trails was originally addressed in House Report 1631 ("HRep 1631") issued in conjunction with the passage of the NTSA in 1968. HRep 1631 provides detailed guidance regarding the intent of the Legislation, and options that Congress declined to implement in the Legislation when it was passed. HRep 1631 provides a clear statement of the intent of Congress regarding multiple usages with passage of NTSA, which is as follows:

> "The aim of recreation trails is to satisfy a variety of recreation interests primarily at locations readily accessible to the population centers of the Nation."[34]

The Organizations note that satisfaction of a variety of recreation interests on public lands simply is not achieved with the implementation of any width corridor/crossing point around a usage or trail and relying on crossing points. Rather than providing satisfaction for all uses, implementation of mandatory corridor/crossing points in open OSV areas will result in unprecedented conflict between users and directly conflicts with the intent of Congress at the time the NTSA was passed. This intent has repeatedly been clarified with amendments to the NTSA since. HRep 1631 clearly and unequivocally states Congress declined to apply mandatory management corridor/crossing points of any width in the 1968 version of Legislation. HRep 1631 states:

> "Finally, where a narrow corridor/crossing point can provide the necessary continuity without seriously jeopardizing the overall character of the trail, the Secretary should give the economics of the situation due consideration, along with the aesthetic values, in order to reduce the acquisition costs involved."[35]

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[34] *See,* HRep 1631 at pg. 3873.
[35] *See,* HRep 1631 at pg. 3861.

Congress also clearly identified that exclusionary corridor/crossing points would significantly impair the ability of the agencies to implement the goals and objectives of the NTSA as follows:

> "By prohibiting the Secretary from denying them the right to use motorized vehicles across lands which they agree to allow to be used for trail purposes, it is hoped that many privately owned, primitive roadways can be converted to trail use for the benefit of the general public."[36]

HRep 1631 clearly addresses the intent of Congress, and the extensive nature of internal Congressional discussions regarding implementation of the NTSA provisions for the benefit of all recreational activities as follows:

> "however, they both attempted to deal with the problems arising from other needs along the trails. Rather than limiting such use of the scenic trails to "reasonable crossings", as provided by the Senate language, the conference committee adopted the House amendment which authorizes the appropriate Secretaries to promulgate reasonable regulations to govern the use of motorized vehicles on or across the national scenic trails under specified conditions."[37]

Implementation of corridor/crossing points is deeply concerning given the fact that if Congress has specifically looked at a management tool and specifically **declined** its application even in 1968. This type of direct material conflict is not mitigated with the passage of time especially when the clearly stated intent of Congress was to satisfy a variety of recreational interests with the passage of the NTSA and subsequently amended the NTSA to clearly state the multiple use nature of any NTSA route.

Subsequent to the passage of the NTSA in 1968, Congress further refined and clarified the management practices for public lands with the passage of Federal Land and Policy Management Act ("FLPMA") of 1976. While FLPMA did not specifically address the relationship of its provisions with the NTSA, FLPMA altered the entire landscape of federal lands management and the implementation of multiple use mandates for the agencies. Subsequent to the adoption of FLPMA, the NTSA was amended in 1983 to clarify that FLPMA and multiple use principals applied through landscape planning decisions controlled the management of not only the footprint of NTSA routes but also the corridor/crossing points around those routes with the passage of Public Law 98-11. The relationship between the passage of PL 98-11 in 1983 further clarifying Congressional

[36] *See,* HRep 1631 at pg. 3859.
[37] *See,* HRep 1631 at pg. 3873.

desires that the NTSA was to benefit a wide range of interests and the adoption of the 1982 Pacific Crest Trail plan by the USFS cannot be overlooked. The 1982 PCT plan moved forward with the concept of corridor/crossing points and crossing points, which Congress had specifically stated were not acceptable concepts for management of NTSA previously and were overruled by Congressional action less than one year later. The response of Congress was the 1983 NTSA amendments which are the single largest and most relevant legislative actions to the concept of management corridor/crossing points around NTSA routes.

The Organizations are aware that the wide-ranging history of the PCT and NTSA puts land managers in the horribly awkward position of implementing forest level management that on its face directly conflicts with a regional management plan. The Organizations believe some level of comfort in these decisions can be achieved by reviewing what other NTSA trail plans have done subsequent to the adoption of the 1983 NTSA amendment. It is significant to note that Continental Divide Trail plan has adopted a blanket recognition of relevant travel management of areas around the CDT in its management plan. The 2009 CDT Plan provisions are as follows:

> "Motor vehicle use by the general public is prohibited on the CDNST, unless that use is consistent with the applicable land management plan and..... (5) Is designated in accordance with 36 CFR Part 212, Subpart B, on National Forest System lands or is allowed on public lands and:
>
> (a) The vehicle class and width were allowed on that segment of the CDNST prior to November 10, 1978, and the use will not substantially interfere with the nature and purposes of the CDNST or
>
> (b) That segment of the CDNST was constructed as a road prior to November 10, 1978; or
>
> (6) In the case of over-snow vehicles, is allowed in accordance with 36 CFR Part 212, Subpart C, on National Forest System lands or is allowed on public lands and the use will not substantially interfere with the nature and purposes of the CDNST."[38]

The Organizations believe that adopting this type of a recommended crossing point standard rather than a mandatory crossing point standard in the Stanislaus winter travel management plan represents a viable solution to management of this issue, even if it does not entirely resolve this conflict, especially when any crossing points for OSVs in open riding areas on or along the PCT are made recommended or non-mandatory

[38] *See*, USFS, *Continental Divide National Scenic Trail Comprehensive Plan* 2009 at pg. 19.

in nature. The Organizations must clearly and vigorously state that any proposed exclusionary corridor/crossing point around the PCT on the Stanislaus NF, in name or function, would be a direct violation of the NTSA provisions mandating management of the trail area be in harmony with adjacent multiple uses of federal lands.

3b. Recommended crossing points in open areas is consistent with the Pacific Crest Trail plan and NTSA amendments and Winter Travel Management Concepts.

As noted in previous sections of this document, Congress has had the opportunity to utilize the concept of a mandatory corridor/crossing point for NTSA routes and specifically chose not to adopt such a concept. Rather than adopting the mandatory crossing point concept, Congress amended the NTSA less than one year after the PCT Plan was adopted, and clearly moved away from the corridor/crossing point concept with higher levels of clarity of the desire for multiple use of the trail and adjacent levels. The Organizations do not believe any credible argument can be made that implementing the limited number of mandatory OSV crossing points will not interfere with maximizing multiple use management of public lands adjacent to the PCT. It is the Organizations position that a large number of recommended crossing points would be highly valuable to the administration of public lands adjacent to the PCT and does not significantly interfere with those utilizing the Pacific Crest Trail in multiple use management areas. The Organizations further submit that attempting to significantly restriction the number of crossing points already on the trail will be functionally impossible on the ground, as the assumption must be made that by designation of mandatory crossing points will result in a long slender closure area around the PCT for OSV travel. The Organizations submit that such a closure would be difficult to sign and enforce on the ground, and almost no public support for that management, and is exactly the management situation that was sought to be avoided in the federal laws governing national trails. The recommended crossing point concept in open areas reduces these challenges when it is implemented without corridor/crossing points.

The PCT plan does address the concept of a crossing point for the PCT and does so in a permissive manner ("Should") rather than a mandatory manner ("must"). The PCT Plan specifically addresses the recommended manner for identification and management of points where multiple usage crosses the PCT as follows:

"Winter sports brochures should indicate designated snowmobile crossings on the Pacific Crest Trail where it is signed and marked for winter use."[39]

It is significant to note the PCT Plan does recommend crossing points for snowmobiles but does not require crossing points for OSV usage. The permissive nature of the PCT plan provides an opportunity for land managers to craft a creative resolution of the issue around PCT management and adjacent land management. Since the PCT plan allows for different classes or types of crossing points and the concept of a motorized crossing point is not defined in the PCT, managers could define a crossing point on a large scale in open winter riding areas, rather than a crossing point of feet a crossing point could be miles in width with recommended locations in these areas. Managers immediately a drawn to a narrowly defined concept of a crossing point but this concept is not required by the PCT Plan. Designation of crossing points several miles in length and corresponding with open riding area boundaries around the PCT would not contradict the PCT and would also avoid conflict with the NTSA amendments as there could be recommended locations for crossing the trail based on factors such as natural features, avalanche risk etc. The Organizations are aware this Alternative is unusual but are submitting this idea in the hope of identifying a cost effective and legal resolution of the issues now being provided to managers to resolve.

The Organizations submit that amendment of the PCT plan as part of the OSV plan would resolve this issue and education of users regarding this change to three types of crossing points could be easily done with trail signage at PCT trailheads. While such education might be time consuming and costly these burdens are significantly less than signing and educating the public regarding a possible corridor/crossing point around the entire trail. The Organizations are aware that even with this type of amendment, education of users remains a critical component of management. Trailhead posting would function in a manner that users would be familiar with as many municipalities rely on this management structure for implementation of local speed limits, which are only posted at municipal boundaries. The Organizations submit that such a management plan would be far easier to implement as there are a limited number of users of the PCT in the winter and such a posting could be at identified points were the PCT enters and exits open riding areas. The Organizations submit that this standard makes far more sense in the long run that trying to close a narrow corridor/crossing point around the PCT to OSV travel and then manage crossing points. Simply posting these corridor/crossing point type closures would entail thousands of signs and a significant amount of resources for ongoing enforcement efforts and would be VERY difficult to educate users regarding.

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[39] *See*, USDA Forest Service; *Comprehensive Management Plan for the Pacific Crest National Scenic Trail*; January 1982 at pg. 21.

3c. Cost benefit analysis must be a component of management of the PCT due to the exceptionally low levels of visitation to the entire trail.

The Organizations are aware of the management challenges and issues that are presented with the closure of a particular trail corridor/crossing point to OSV usage in a landscape area that is otherwise subject to an open riding area designation for OSV usage. Simply signing and educating the public about such a restriction would be exceptionally difficult and costly and could not be justified on a cost/benefit basis due to the low levels of visitation to many of these areas by non-motorized users.

The Organizations concerns regarding the cost/benefit of the two alternatives for management of the PCT in open motorized areas are not abstract but are based on a consistent concern of both the Executive Branch and Supreme Court and are further compounded by the fact that the Pacific Crest Trail Association recommends that the public not use the PCT in the winter due to safety concerns. The review of the costs of a project and associated benefits of that project has been a consistent point of emphasis for President Obama, with EO 13563 of 2011 and President Trump under EO 13771 of 2017. Additionally, the US Supreme Court has clearly identified the cost/benefit analysis as a major component of the administrative management process. The Supreme Court clearly states this as follows:

> "in an age of limited resources available to deal with grave environmental problems, where too much wasteful expenditure devoted to one problem may well mean considerably fewer resources available to deal effectively with other (perhaps more serious) problems."[40]

When the application of cost/benefit analysis principals are applied to the implementation of a corridor/crossing point around the Pacific Crest, the analysis of the idea becomes problematic due to the low levels of visitation of the PCT at the landscape levels. The Pacific Crest Trail Association provides a detailed annual review of the visitation of the PCT and this visitation encompasses only about 100 visitors to the entire PCT[41] and recommend that the public not use the trail in the winter. The Organizations are aware that certain portions of the PCT are visited at high levels, but this visitation should not be allowed to influence multiple usage on other areas of the PCT where visitation is low. Any site-specific challenges due to higher levels of

[40] *See*, Entergy Corp v. Riverkeepers Inc. et al; 556 US 208; 475 F.3d 83 (2009); Opinion of Justice Breyer at pg. 4.
[41] *See*, https://www.pcta.org/discover-the-trail/thru-hiking-long-distance-hiking/2600-miler-list/

visitation are addressed in existing planning with the concept of a crossing point. These low levels of visitation make cost benefit balancing difficult in lower visitation areas and time of year.

Education of users regarding any corridor/crossing point around the PCT will be a major and probably ongoing expense of the corridor/crossing point, especially in the winter. Simple signage at trail heads may work for summer usage but Winter travel restrictions will require site specific signage and then ongoing maintenance to insure visible. Often landmarks that provide quality navigation guides, such as streams, are rendered useless in the winter. Rather than seeing a clearly defined boundary of the creek, users will simply see a larger play area as the boundary is obscured by snow, forcing managers to supplement the boundary with boundary specific signage. Signage of this nature has been found to difficult to maintain when used in Wilderness areas, as with every storm the signs often quickly get buried with snowfall. Additionally, the cost benefit of any winter corridor/crossing point is further brought into question by the fac that the PCT is recommended to not be used in the winter time due to significant safety concerns in many areas. Again, this weighs against any corridor/crossing point designations in OSV planning, as the exceptionally low levels of travel in the summer become functionally non-existent in the winter time.

Objection Resolution #3

The Organizations are aware there is a large amount of policy and legislation involved in this objection, but our suggested resolution for this entire objection is simple and would to adopt a landscape level policy for OSV planning and NTSA routes that would tie NTSA crossings to the three use categories for winter travel management. Our recommendation would be as follows:

1. **In areas closed to snowmobile, there are no crossing issues** so there is no discussion of the relationship between these management standards. These areas remain closed.
2. **In areas where OSV usage is restricted to designated routes, the crossing point concept would be mandatory** unless topography or local factors concerns required otherwise (such as when routes are not crossing at right angles etc. due to topography or there are drifting or avalanche concerns for the crossing point.). Our recommendation would be to adopt a trail corridor concept for planning in terms of width of crossing points for these areas to avoid trails being groomed outside the specific crossing point or other types of issues and to avoid unnecessary conflicts when NTSA route users are not in the proper location. This would be exemplified by a mandatory crossing point being several times wider than the width necessary for a single OSV or groomer to traverse the NTSA route. Managers would be encouraged to

utilize natural features that are locatable in the winter to define the crossing points rather than mandatory widths etc. Flexibility should be built in to allow for adjacent uses, such as wider corridors for crossing in areas where hybrid skiing is allowed in order to allow skiers to pull their OSV off the trail while they are skiing on adjacent lands.

3. **In areas designated as open, identified crossing points would be permissive or recommended** rather than mandatory and large in size often reflecting the boundaries of the open area. This would allow simplicity of management in a manner consistent with all guidance and provide this management cost effectively.

Objection number 4 - Dates are used to trigger winter travel management in violation of the winter travel rule.

The Organizations have already expressed significant concern about the ability of the Forest Service to educate the public regarding any OSV travel decision requirements due to the variety of standards being used for snow depth and the fact that many activities can be legal on one forest and illegal in others. This situation will make it very difficult for the public to understand and comply with any decision. The Organizations are opposed to the addition of any additional criteria for the use of any area, as this new criterion will make education that much more difficult when the plan is implemented.

The Organizations must object to the proposed use of dates to trigger closure of the Hwy 108 area on the Sonora Pass area in the following manner:

> "A season of use in the portion of the HWY 108 cross-country OSV use area located at Sonora Pass (411 acres, FEIS Map 5 and Draft ROD Map) will be implemented by: o Season of Use A: Closing the area to cross-country OSV use, by vehicles designed specifically for that purpose, annually on April 15, unless the Forest Supervisor issues a Forest Order for an earlier or later closure date (but no later than the last Sunday in April) in coordination with the Bridgeport Ranger District's seasonal management of the Bridgeport Winter Recreation Area (USDA Forest Service 2010, Bridgeport Winter Recreation Area Management Plan)."[42]

As the Organizations have previously noted the new winter travel rule specifically and clearly states that sufficient snow for the protection of resources is the primary trigger for the management of OSVs. [43] There is simply no basis or analysis provided in the FEIS to support the alteration of this standard. Additionally, the imposition of a hard date of April 15 for use of the Sonora Pass area conflicts with the decision of the

[42] *See*, Draft ROD at pg. 3.
[43] *See*, 36 USC 212.81

Bridgeport Ranger District decision for the management of the area, which outlines their triggering process as follows:

> "Close the PCT Crossing Route to motorized use when one of the following occurs, whichever comes first. (Also see design features described below under "Wildlife/Natural Resources Disturbance" describing conditions for earlier closures.)
> o BWRA is closed to snowmobile use.
> o Caltrans reopens Highway 108 to vehicle traffic.
> o No later than the last Sunday in April."[44]

In addition to failing to comply with the sufficient snow criteria for management of OSV recreation, the Stanislaus now proposes to manage the Hwy 108 area in a manner that conflicts with adjacent management. Rather than bringing the Hwy 108 area into compliance with minimum snow requirements the ROD expands the conflict with new management standards.

Objection resolution #4

Manage the Sonora Pass area pursuant to the existing federal requirements of sufficient snow to protect resources.

5. Conclusion.

The Organizations appreciate the steps that have been taken in the Stanislaus OSV planning efforts to resolve our preliminary concerns on the draft proposal. While these revisions were a step in the right direction, these efforts simply did not fully resolve our concerns, and as a result we have been force to file this objection to insure:

1. OSV planning must comply with all best available science on snow for determination of compacted and uncompacted snow depths.
2. OSV Planning standards on the Stanislaus NF must be consistent with management standards on adjacent forest for issues like snow depth, snow consistency and minimum elevations in order to avoid creating a management structure that the public can understand and allows for consistent management of issues across forest boundaries.

[44] *See*, USDA Forest Service; *Bridgeport Ranger District; Environmental Assessment; Pacific Crest National Scenic Trail Crossing*; October 2011 at pg. 14.

3. PCT management standards must comply with federal law and the Organizations recommend a three-step crossing point model to correspond with adjacent OSV management decisions.

If you have questions please feel free to contact either Fred Wiley, ORBA's Executive Director/CNSA Past President at 1701 Westwind Drive #108, Bakersfield, CA. Mr. Wiley phone is 661-323-1464 and his email is fwiley@orba.biz. You may also contact Scott Jones, Esq. at 508 Ashford Drive, Longmont, CO 80504. His phone is (518)281-5810 and his email is scott.jones46@yahoo.com.

Respectfully Submitted,

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Enclosures