The agency and public representatives are thanked for taking the time to participate and share information about the projects and Upper Truckee River Watershed activities! The time and input from staff and others were greatly appreciated.

1. *The current Upper Truckee River (UTR) strategy and philosophy focuses the design of projects on the restoration of geomorphic and ecosystem functions. In what ways is this approach likely to be effective or ineffective, as a whole, in achieving the projected benefits?*

The focus on restoration of geomorphic and ecosystem functions is commendable, but the achievement of benefits for the Strategy are not clear. For example, if there is a desire to improve fisheries and aquatic habitat in the watershed, or reduce sediment transport, will the focus on these two areas adequately result in such outcomes? The other concern about these foci is that the general public or non-scientists may not relate as well to this terminology and therefore may find it difficult to understand the projects or support them. Having a philosophy that is more easily understandable and quantifiable may be more effective. For example, the philosophy is to improve fish populations or reduce sediment loading may be more understandable even though the processes that may do this are geomorphic and ecological. Another concern about this focus on geomorphic and ecosystem functions is that these actions alone may not bring the watershed to the desired state. See my comments further down about having a vision for the watershed that might provide for actions and discussions around more holistic approaches to improving the watershed. I am not advocating to abandon the geomorphic and ecosystem function or other scientifically-based approaches, but to instead include them within an overall vision for the watershed that will make them more understandable.

2. *How could the overall restoration strategy be improved to provide the most robust, comprehensive, coordinated, and coherent framework for restoring ecosystem function and resiliency within the UTR stream channel and floodplain?*

The strategy of coordinating efforts between agencies is very positive. The existence and function of the UTRWAG is not a trivial accomplishment, and the engagement of the different agency partners is really nice to see. It is great that non-agency stakeholders (like the general public and other interested parties) are also part of the UTRWAG. From my experience in working with multiple agencies trying to agree on an actionable strategy on the Truckee River in Nevada regarding water quality monitoring, I sense that the use of somewhat vague language and lack of quantification may be due to the attempt to achieve consensus amongst different missions and priorities of different agencies. The list of goals and objectives is very comprehensive, but it seems like it could be difficult to prioritize projects with such a large list. It also may make it difficult to economize on monitoring or other project aspects.

Perhaps another way to proceed would be to try to agree on a vision of the desired watershed. Note that I am suggesting a watershed vision first, rather than reach visions. Although the restoration may likely occur on a reach basis, having an overall watershed vision will help to prioritize and adapt over time in a more effective manner. Having a vision will also help to determine the kinds of things that need to be monitored to examine if work is progressing towards that vision. By vision, I mean something like: the watershed will support populations of native fish species (perhaps be specific about the species or population threshold), the watershed will retain fine sediments (or specify a reduction of sediment in relation to the current sediment load or some past sediment load). The vision can consist of multiple desired outcomes (for example, both fish and sediment can be part of the vision). Further, a vision does not have to be restricted to what is doable now; it can imagine 'best case' situations or the removal of barriers that currently exist to create an optimistic outlook towards what is desired. Having a vision of

what is desired 10-, 20-, or however far in the future the group would like to look would then lead to goals and objectives that support that vision and help to prioritize funding, monitoring, and projects. It will also make the Strategy more comprehendable to wider audience.

3. *The UTR restoration effort involves a wide range of varying landscapes, impairments, constraints, and opportunities. Considering the significant variations in individual project reaches and the potentially different restoration concepts used in specific settings, what additional guidance can the inter-agency strategy incorporate to ensure that the most efficient and beneficial river-wide effort is implemented?*

As noted above, I think that having a watershed-level vision and strategy will help to guide prioritization and selection of reach-level activities. The Strategy document notes that all projects in the document are priorities, but having a way to connect the projects to the watershed vision may help with conveying the benefits and challenges of projects, and making difficult decisions if funding is inadequate or other constraints are present. Such a connection (or "prioritization") does not have to set the order of completing projects in stone; as was aptly pointed out, the constraints of funding, permitting, and acquisition of property will likely dictate that. These factors can also be included in a prioritization or 'selection' metric to make the reasoning for doing certain projects more 'transparent.'

4. *Does the monitoring, analysis and reporting as described in the UTR strategy document, adequately provide guidance for measuring success in achieving the stated goals and objectives? In what ways can the monitoring, analysis and reporting be improved?*

Monitoring should be a priority, otherwise it is difficult to tell if conditions are improving or realize that activities or events are having impacts. In addition, the collected data need to be analyzed, shared, and reported. Securing sustainable funding for ongoing monitoring, data analysis, and data sharing can go a long way towards demonstrating success of projects, learning about impacts of natural and anthropogenic-induced variability, providing background data to argue for projects and project funding, detect effects of climate change, communicate with stakeholders and the public, etc. While it may be easier to secure funds for "projects," demonstrated success of these projects (and support for future projects) will rely on what is invested in monitoring and data analysis. Ongoing monitoring will be important for teasing apart project impacts as well as capturing the effects of activities or events outside of project/agency control, such as climate change or wildfire. The issue of fuels reduction was brought up, and understanding of impacts of these types of activities may also be observed.

Monitoring for projects should be connected to quantifiable objectives. Most of the quantifiable goals discussed were related to geomorphic form, but if there are objectives of reducing sediment loads or improving fish habitat in particular, there should be quantifiable objectives and associated monitoring. As explained during the workshop, such monitoring can be expensive. Temperature should be a relatively inexpensive parameter that can be monitored to address fish habitat. Dissolved oxygen and turbidity could be measured with handheld instruments that would require $1500-$2500 to purchase but which could be used repeatedly to capture in situ measurements.

I noted the lack of specification for monitoring water temperature, which should be a monitored parameter if fish restoration is a goal and there are concerns about climate change impacts. I recommend ongoing monitoring of water temperature if it is not already being done, and monitoring of water temperature as part of project monitoring. If projects are expected to connect with shallow

groundwater and influence baseflow, such success should be detectable with appropriate temperature monitoring.

The diagram that the projects are using for existing conditions and project objectives is not very effective for communicating objectives and monitoring (for example, see Figures 2 and 3 of the Final Monitoring Plan for Reaches 3 and 4). Showing this figure on one page or one slide makes it very difficult to read the assessments or objectives and gives an impression that project personnel do not want others to know what the assessments or objectives are.

5. *Ecosystem resiliency is an overarching restoration goal. How do we more effectively communicate to the public and local government representatives the technical processes undertaken to select project approaches to achieve this goal, such as balancing risk of potential short term construction related impacts of restoration projects with the long term benefits to ecosystem function and resiliency?*

Communication about the efforts outlined in the Strategy could be improved. We were very impressed with the way interested parties in the Upper Truckee Restoration efforts took the time to attend and participate in this meeting and how public comments were handled and conveyed. We also heard about some of the challenges of involving and educating the public, stakeholders, and government representatives. Many of the concerns and challenges are found with most projects of this scope, and some are unique to this region. I understand that many times, agencies are constrained by their mandates and regulations from inside and outside of their organizations, and oftentimes, others outside the organization are not aware of these constraints.

Based on my experience in working within the public, private, and academic sectors, I recommend that agency staff consider more carefully how they convey their work to the public and carry out interactions with the public. In other words, interacting with stakeholders and the public is necessary for the success of these projects, but not just because it is a requirement of regulations and permits. I realize that we are seeing a snapshot of a long evolution of addressing these issues, and that this activity (the panel) is a small part of the continued evolution of affecting the ecosystems of the Upper Truckee River Watershed. I am sure that there is a long history of interactions with different stakeholders and interests in the watershed, but it is also important to continue to engage and recognize that such interests are also fluid and evolving. These interests can also provide histories and perspectives on projects that staff may not be aware of.

Because the UTRWAG can already have non-agency members, a listserve from the UTRWAG could be a means of communication about issues related to the watershed, ongoing activities, and opportunities to get involved, if it is not already doing that. The UTRWAG could coordinate a series of visioning workshops, which should involve the public. Connecting more actively with different NGOs that have large memberships in the Basin could also help with publicizing the projects more.

The Marsh project in particular offers excellent opportunities for project visibility and education. It reminds me a little of the McCarran Ranch project on the Truckee River downstream of Reno, where The Nature Conservancy (TNC) was able to implement a river restoration project that showed excellent results within one year of implementation. An overlook on Highway 80 was used to make it easy for travelers to pull over and see the project. TNC was able to use the success of this project to convince agencies to provide funding for more restoration projects on the Truckee.

While some may be opposed to providing boardwalks and encouraging access by the public to the Marsh, in my opinion it is a great opportunity for connecting with a lot of people and educating them about anthropogenic impacts on the watershed and why further restoration is needed. The implementation of a successful restoration project with quantified results and its proximity to South Lake Tahoe and Lake Tahoe itself could make it an iconic project for the Tahoe basin and for restoration projects across the country.

Educational placards about watershed visions and issues could be placed even before project funding is attained. Some placards already exist at the Marsh and Sunset Stables sites, and these could be enhanced to provide more information about the watershed and how restoration of these sites may benefit the watershed. Some funding would be needed for such placards but they should be minimal compared to the actual project costs.

Providing opportunities for the public to volunteer with projects will help with outreach. Connections with area schools, colleges, and universities may be useful for educating students, their instructors, and their parents about watershed issues. For example, I am the faculty advisor for The UNR Ecohydrology Club, and these students are eager to find hands on activities that will help with ecosystem issues. While residents of the Tahoe Basin may be saturated with opportunities to volunteer and participate, residents of nearby communities like Reno and Carson City may see opportunities to volunteer in the Tahoe basin as novel activities that will be fun and exciting.

An activity I was involved with in Colorado called Children's Water Festivals could be effective here as well. These Festivals were arranged by the Central Colorado Water Conservation District to educate 5th and 6th graders about water issues by having water professionals in the community volunteer to provide hands-on activities for the kids about water issues. These activities included things like demonstrations of groundwater flow, gold panning, a mock water court, and having kids stand in a shower stall that rained the amount spun on a 'water wheel' with return period probabilities. The activities were developed and put on by the water professionals (i.e., consultants, agency personnel, professors, graduate students, etc.). Approximately 1500 kids went through the activities in one day.

The development of a website where anyone can get information and data on watershed issues would also help with communication not only to the public, but amongst agency personnel also. Please also see my response to Issue 6.

Development of a watershed council for the basin may also help improve public education of watershed issues. The Truckee River Watershed Council on the other side of the Lake is a good example of such a grass-roots organization that does a good job of engaging and educating the public.

Please also note that in these suggestions, I consider communication with the public to involve reaching out to those who live inside and outside the Tahoe basin. The agencies and residents of the basin can see the visitors to the basin as potential contributors to restoration efforts as well – many come because they enjoy the recreational and aesthetic values the basin provides, and they may be interested in supporting these projects as well.

There may be ways to engage and get input from visitors from outside the basin. Local businesses could be engaged to distribute or display information or newsletters about projects. Surveys could be conducted at recreation spots not only by filling out paper or online surveys, but also by using creative mechanisms to cast votes. For example, visitors could indicate how important good fishing is to them by

dropping tokens in different canisters on site. Or they could vote for what aspects of the watershed are important to them in a similar way at different spots along the watershed.

6. *How should new scientific information and technical advice that is obtained as part of program or project development be incorporated to improve and expand the river-wide restoration strategy?*

A place for sharing data and project results would be useful (perhaps the LTIMPS site?). Having an entity like the Tahoe Science Consortium manage the database, coordinate the monitoring program, and analyze the data would be very beneficial for tracking project impacts as well as impacts of hydrologic events.