Testimony of Steven L. Caicco
Before State Water Resources Control Board At Hearing Regarding
Water Right Applications 31487 and 31488 by US Bureau of Reclamation
Change Petition 5169 by Washoe County Water Conservation District,
Change Petition 9247 by Truckee Meadows Water Authority,
Change Petition 15673 by US Bureau of Reclamation
Change Petition 18006 by US Bureau of Reclamation

My name is Steven L. Caicco. I have worked primarily for the U.S. Fish and Wildlife Service since 1992 in a variety of capacities, and since 2003 for the Nevada Fish and Wildlife Office in Reno, Nevada as the lead biologist for the Truckee River Operating Agreement (TROA). In my previous position, from 1992 to 1996 at the Sacramento Fish and Wildlife Office in Sacramento, California, I worked on a range of projects including the environmental analysis of TROA in Nevada and California and on the American River in California. I have a Master's Degree from the University of Idaho in botany with an emphasis on plant ecology. A copy of my resume is included as Exhibit USBR 11. My testimony pertains to the potential effects of TROA on biological resources of the Truckee River and its tributaries, the affected lakes and reservoirs

1. Overview of Biological Resources

Sec. 205(a) of Public Law 101-618 directed the Secretary of Interior to negotiate an operating agreement for the Truckee River reservoirs. Exhibit App./Pet. Joint-16. Among the requirements is that the operating agreement shall provide for the enhancement of spawning flows available in the Lower Truckee River for the Pyramid Lake fishery in a manner consistent with the Secretary's responsibilities under the Endangered Species Act, as amended. Among the provisions of TROA that further this obligation are Section 7.C, which establishes Fish Credit Water and Joint Program Fish Credit Water, and Section 9, which provides for Minimum and Enhanced Minimum Releases from Lake Tahoe, Donner Lake, Prosser Creek Reservoir, and Stampede Reservoirs under certain conditions. Exhibit App./Pet. Joint-19. While the purpose of Section 9 releases is to maintain instream flows for fish and other biological resources in California, benefits of these releases also extend downstream along the mainstem of the Truckee River in Nevada.

Because TROA was negotiated to meet these requirements as well as avoid significant adverse effects to biological resources, no need for mitigation has been identified in any of our analyses. In many cases, management flexibility inherent to TROA results in beneficial effects. The biological benefits that accrue from the flexibility to create opportunities for storing and managing categories of credit under Section 7 of TROA and the minimum and enhanced releases provided for under Section 9 of TROA include:

- An enhanced ability to provide spawning flows to the threatened and endangered fish of Pyramid Lake and the Truckee River through managed releases during April through June, a critical period for Cui-ui and Lahontan

cutthroat trout spawning as well as the window of opportunity for establishment of cottonwood and willow.

- An enhanced ability to extend the period of enhanced flows especially under dry and extremely dry hydrologic conditions which provides benefits to the maintenance of riparian vegetation.
- Increased average annual inflow to Lower Truckee River and Pyramid Lake.
- Appreciably greater flows in Independence Creek, Little Truckee River, and Prosser Creek and downstream from the Truckee Meadows in dry hydrologic conditions .

2. TROA Benefits Fish in Truckee River and Affected Tributaries

Many species of native and non-native fish occur in the Truckee River and its tributaries. In most cases, little information is available on their life history habitat requirements. Because of their recreational importance, however, much information exists on the needs of brown and rainbow trout. For this reason, brown and rainbow trout were used in our environmental assessment as surrogates for all fish species in the river system. Brown trout spawn and the eggs incubate from October through January and juveniles develop from February through March. Rainbow trout spawn and the eggs incubate from April through July and juveniles develop rear them in August and September. When combined, therefore, our assessment of the reproductive needs of these two species span the entire year.

The California Department of Fish and Game (CDFG) and the Nevada Department of Wildlife have recommended preferred, minimum[1], and maximum (California only) flows for spawning, incubation, and rearing of brown and rainbow trout in the Truckee River and its major tributaries (Exhibit SWRCB-7, FEIS/EIR Table 3.38). Under current management, each Truckee River reservoir has its own purpose and is managed accordingly. Under the water exchanges allowed by TROA, the reservoirs can be operated as an integrated system in a way that benefits fish in both the Truckee River and its tributaries. Our assessment of preferred, maximum, and minimum flows, confirmed that operations under TROA would in most reaches have no effect under wet and median hydrologic conditions, but would provide benefits in all reaches during dry and extremely dry hydrologic conditions. We also confirmed that TROA could reduce the frequency of flushing and stranding flows of Prosser Creek and Stampede Reservoirs from October through March, as well as lower the frequency of low flows in winter months that increase the potential for anchor ice formation in Donner and Independence Creek. Anchor ice reduces the amount of available habitat for fish and can also reduce the invertebrate population on which fish feed. No significant adverse effects were identified.

[1] These minimum flow recommendations are not the same as the minimum releases provided under Section 9 of TROA.

3. TROA Benefits Fish in Lakes and Reservoirs

Many native and non-native fish occur in the lakes and reservoirs in the Truckee River Basin. CDFG has recommended minimum storage thresholds for Prosser Creek, Stampede, and Boca Reservoirs to maintain fishery, water quality, and aquatic productivity. In Nevada, NDOW has recommended a conservation pool in Lahontan Reservoir to minimize algal blooms. Because more water can be stored in California reservoirs under TROA, storage would fall below this threshold ranges less often. Our analysis confirms that the frequency that storage would fall below the recommended minimum threshold ranges between 9 and 35 percent less under TROA than under any other alternative; this is a beneficial effect. There is no difference among the alternatives at Lahontan Reservoir.

Another aspect of reservoir storage important to fish in lakes in reservoirs is the amount of shallow water fish spawning habitat. Due to large fluctuations in water level and steep slopes, Prosser Creek, Stampede, and Boca reservoirs are not conducive to shallow water spawning. Lake Tahoe, Donner, Independence, and Pyramid Lakes and Lahontan Reservoir provide the best shallow water spawning habitat. Lake Tahoe has such a large surface area that water management has little influence compared to natural fluctuations in lake level. Because the other lakes and reservoirs either have less fluctuation in lake level or more gradual subsurface slopes, we did not expect to find large differences among the alternatives in the total area of spawning habitat. Our analysis confirmed that there were only small differences (a few percent or less) in the average total area of shallow water spawning habitat among the alternatives. Provisions of TROA that allow for water exchange among the reservoirs will provide greater flexibility to manage fish spawning habitat at Independence Lake.

4. TROA Benefits Waterfowl and Shorebirds

Many species of waterfowl and shorebirds use lakes and reservoirs in the Truckee River Basin. Lake Tahoe, Pyramid Lake, Lahontan Reservoir, and, to a lesser extent, Stampede Reservoir, provide large quantities of stable, high quality habitat that supports the largest populations of waterfowl. Stampede and Lahontan Reservoirs and Pyramid Lake also have islands where many bird species nest. Donner and Independence Lakes and Prosser Creek and Boca Reservoirs provide relatively limited habitat because of their small size, high recreational use, or widely fluctuating water elevations.

Most waterfowl and shorebirds prefer to forage in water less than 18 inches deep along the shoreline. Our analysis of the average total area of shallow water foraging habitat showed no difference among the alternatives under most hydrologic conditions at Lake Tahoe, and

Stampede and Lahontan Reservoirs. Because more water can be stored under TROA in Stampede Reservoir, we expected that more shallow water habitat would be available. Our analysis confirmed that the increased storage at Stampede resulted in 60-80 percent more habitat under dry hydrologic conditions. A second aspect important to waterbirds is predator access to the nesting islands in Stampede and Lahontan Reservoirs and Pyramid Lake. Our analysis confirmed that the increased storage at Stampede Reservoir reduces the frequency of predator access to nesting islands. No differences among the alternatives occur at Lahontan Reservoir. Because of the water depth, Pyramid Lake would not drop low enough to permit predator access to Anaho Island under any alternative.

Inundation of the island at Stampede Reservoir was also assessed for its potential impacts to the local Canada goose population. Due to the increased storage, we found a potential increase in inundation frequency of 70 percent under TROA compared to 56 to 58 percent under the other alternatives. When the substantial decrease in predator access to this island under TROA is considered, however, the number of years conducive to goose nesting success under can be as much as twice that of any other alternative.

5. TROA Benefits Riparian Habitat and Riparian-Associated Wildlife

The Truckee River flows through a diversity of riparian and upland habitats as it crosses the broad transition from the montane forest of the Sierra Nevada to the desert shrub of the Great Basin. This great diversity provides a wide variety of habitats for riparian-associated wildlife. Birds show a stronger preference for specific types of riparian habitats than do most other wildlife and often require certain structural components such as trees or shrubs of a certain height. Riparian vegetation in the arid west is adapted to high variability in annual stream flow. Woody species, in particular, can shed their leaves in response to drought and is capable of persisting through extended periods of low stream flow. It is also highly resilient, meaning that it is capable of vigorous growth when sufficient steam flows return.

Detailed data on the water needs of most riparian species are not available and depend greatly on specific site conditions. Because the water exchanges allowed by TROA provides for an integrated operation of reservoirs that currently are managed individually, we expected that management under TROA would benefit riparian habitat and the wildlife associated with it. We anticipated that these benefits would occur primarily under dry and extremely dry hydrologic conditions since water stored under wetter conditions would be released under drier hydrologic conditions. Riparian vegetation is influenced by flow magnitude and patterns of flow frequency, timing, and duration, as well as by prolonged periods of extreme high or low flows. Because we lack detailed data on most of these factors, we compared predicted average monthly flows from April through October to recommended ecosystem maintenance flows downstream from McCarran Boulevard, or to CDFG and NDOW

recommended minimum flows in reaches and tributaries upstream of McCarran Boulevard. This period from April through October corresponds to the months when riparian plants emerge from winter dormancy, grow, reproduce, and re-enter dormancy, induced either by drought or colder temperatures. The ecosystem maintenance flows incorporate flows critical to the survival of cottonwood trees in dry years. The recommended flows for other reaches in Nevada and California represent minimum fish flows that, in the absence of other data, are assumed to also represent a critical threshold for riparian vegetation.

Our analysis confirmed that TROA had no effect in most reaches under wet and median hydrologic conditions, when water is stored while recommended minimum flows are sustained. The benefits of TROA are most pronounced under dry and extremely dry hydrologic conditions when the stored water is released. Of particular benefit is the opportunity to provide riparian maintenance flows later in the growing season under TROA than under any of the other alternatives. These enhanced summer and fall flows allow for an extended growth period for riparian vegetation (Exhibit USBR 16).

6. Endangered, Threatened, and Other Special Status Species

TROA Benefits Cui-ui Spawning and Lower Truckee River Ecosystem Maintenance

Cui-ui are listed as endangered and are one of the two fish species that by law must benefit from TROA. We evaluated the potential effects of TROA on cui-ui by using three indicators:

- Frequency of Achieving Optimal Flow Regimes from April through June
- Riparian Habitat along Lower Truckee River
- Average Annual Inflow to Pyramid Lake

The Service, in cooperation with the Pyramid Lake Paiute Tribe, developed a water management plan for Stampede Reservoir based on six-flow regimes that are intended to release less water in the spring and more water in late summer and fall. This strategy was designed to more closely mimic the natural flow regime of the river while protecting habitat for cui-ui and Lahontan cutthroat trout. In practice, this strategy resulted in successful cui-ui spawning in 2002, an extreme dry year, using only 23,000 acre-feet of supplemental water from storage (see testimony by Ali Shahroody, Exhibit USBR 7 for more details on the flow regime strategy). We expected that operations under TROA would achieve optimal flow regimes more frequent because water can be stored when it isn't needed for environmental purposes and released when it is needed. We assessed the frequency that the optimal flow regimes (1 or 2) could be achieved during the months of April through June under TROA as compared to the other alternatives. These months are the critical period for cui-ui spawning

as well as riparian tree and shrub germination. We found no differences among the alternatives in their ability to achieve flow regime 1, but TROA provided greater opportunity to achieve flow regime 2 than the other alternatives in both May and June (Exhibit USBR 17).

The shade produced by riparian vegetation along the Lower Truckee River benefits cui-ui by lowering water temperature. TROA provides beneficial effects to riparian vegetation by enhancing flows downstream of Derby Diversion Dam especially under dry and extremely dry hydrologic conditions. As noted earlier in my testimony, enhanced flow later into the growing season allows for an extended growth period for riparian vegetation.

The level of Pyramid Lake is important to cui-ui spawning access to the lower Truckee River across the Truckee River delta and enhances lake habitat. Our analysis of inflow to Pyramid Lake shows that TROA provides about 11,000 acre-feet greater inflow than No Action and 4,000 acre-feet greater inflow than under current conditions (Exhibit USBR 18). These higher inflows under TROA are due to greater reservoir spills under wet hydrologic conditions. During dry and extremely dry hydrologic conditions under TROA, more water is available from reservoir storage, including water that results from the conversion of Municipal and Industrial Water to Fish Credit Water under Section 7.B.4(e) of TROA and water provided for water quality purposes under Section 1.E.4 of TROA. This is a beneficial effect of TROA for cui-ui spawning.

TROA Benefits Lahontan Cutthroat Trout (LCT) and Truckee River Ecosystem Maintenance.

LCT is listed as threatened and are one of the two fish species that by law must benefit from TROA. We evaluated the potential effects of TROA on LCT by using three indicators:

- Riparian Habitat along Lower Truckee River
- Average Annual Inflow to Pyramid Lake
- Spawning Access to Independence Creek

The first two of these indicators were discussed previously under Cui-ui. TROA provides beneficial effects to riparian vegetation by enhancing flows downstream of Derby Diversion Dam especially under dry and extremely dry hydrologic conditions. As noted earlier in my testimony, enhanced flow later into the growing season allows for an extended growth period for riparian vegetation and postpones leaf senescence during drought years. Our analysis of inflow to Pyramid Lake shows that TROA provides about 11,000 acre-feet greater inflow than No Action and 4,000 acre-feet greater inflow than under current conditions (Exhibit USBR 18). These higher inflows under TROA are due to greater reservoir spills under wet

hydrologic conditions. During dry and extremely dry hydrologic conditions under TROA, more water is available from reservoir storage, including water that results from the conversion of Municipal and Industrial Water to Fish Credit Water under Section 7.B.4(e) of TROA and water provided for water quality purposes under Section 1.E.4 of TROA. This enhances lake habitat and LCT access to the Truckee River and is a beneficial effect of TROA.

Independence Lake has the only self-sustaining lake LCT population in the Truckee River Basin.A sand/silt delta has formed where Independence Creek enters the lake, which blocks LCT spawning runs into the creek when lake storage is less than 7,500 acre-feet. We evaluated the number of times that storage is at or below that figure under all of the alternatives and found no differences. Section 5.B.7(a) of TROA, however, provides for CDFG to direct the Truckee Meadows Water Authority to provide and maintain a fish channel through the Independence Creek delta should storage fall below 7,500 af. This is a benefit under TROA when compared to all other alternatives.

Bald Eagle

We evaluated the effects of TROA on the bald eagle prey base at Stampede, Boca, and Lahontan Reservoirs using the same indicators as we used for fish in lakes and reservoirs. TROA provides a beneficial effect on the prey base of bald eagles at Stampede and Boca Reservoirs, and has no effect at Lahontan Reservoir. TROA has no effect on spring/summer shallow water spawning habitat for the prey base of bald eagles at any of these reservoirs.

Tahoe Yellow Cress

The Tahoe yellow cress is a federal candidate plant species for listing that occurs only on the shores of Lake Tahoe. We assessed the effects of all the alternatives on available and potential habitat for this species. The ecological conditions on which the Tahoe yellow cress depend are well understood. The number and size of populations and the number of individual stems correspond to the lake level in any given year. Less habitat is exposed when the lake level is above 6,226 feet and fewer populations are present. When the lake level drop below this threshold, more suitable habitat is exposed and more plants are present at more locations. The lake level in any given year depends on the end-of-season lake level the previous year and the inflow to the lake which comes largely from snowmelt. Because the snowpack is highly variable, so is the lake level. The upper limit of the lake level is established by law at 6.229.1 feet and releases cannot be made when the lake falls below its rim at 6,223 feet. Management that could potentially affect the available habitat for Tahoe yellow cress is possible only with 6.1 feet of storage. We found that none of the alternatives had a effect on the available and potential habitat for Tahoe yellow cress, due to the wide

natural fluctuations of the lake level and the surface area of the lake itself. These two factors limit the ability of lake level management to affect the Tahoe yellow cress in negative or positive ways.

Island Nesting Water Birds

We assessed the potential effects of all alternative on the American White Pelican prey base at Pyramid Lake, predator access to California gull nesting islands in Lahontan Reservoir, and Osprey prey base at Stampede, Boca, and Lahontan Reservoirs. TROA would have a beneficial effect on the prey base for the American White Pelican at Pyramid Lake due to its greater ability to achieve flow regime 2 during the months of May and June, as previously discussed. There would be no effect on predator access to islands where California gulls nest in Lahontan Reservoir. Ospreys depend on the same prey base discussed previously for the bald eagle. TROA would have a beneficial effect on fish survival at Stampede and Boca Reservoirs and no effect on osprey and California gull at Lahontan Reservoir. TROA would have no effect on spring/summer spawning habitat at any lake/reservoir.

Habitat for other Special Status Plants and Animals

Other special status plants and animals are a subset of riparian-associated wildlife and, therefore, subject to the same considerations with respect to potential effects to riparian habitats. On the basis of our analysis, we found either no effect or beneficial effects on riparian habitats under TROA in all reaches under wet, median, dry, and extremely dry hydrologic conditions. The benefits were most pronounced under dry and extremely dry hydrologic conditions when riparian maintenance flows would be available later in the growing season than under any of the other alternatives. Increased summer flows allow for an extended growth period for riparian vegetation (Exhibit USBR 16).

Conclusion

Based on results of our environmental analysis of TROA implementation compared to the current conditions, no action, and local water supply alternatives, TROA satisfies the requirement of P.L. 101-618 that it enhances spawning flows available in the lower Truckee River for the Pyramid Lake fishes in a manner consistent with the Secretary's responsibilities under the Endangered Species Act, as amended. In addition, the flexibility inherent in the negotiated agreement provides the flexibility to store water and manage releases in a way that provides benefits to stream flow in the Truckee River and its affected tributaries. These benefits are of particular significance under dry and extremely dry hydrologic conditions because of the ability to provide increased flows, when compared to the other alternatives, from May through October. Increased flow during this period enhances the ability to

enhance spawning flows for cui-ui and Lahontan cutthroat trout and riparian ecosystem maintenance flows under suboptimal hydrologic conditions. Our analysis also showed that the negotiated TROA has no significant adverse effects on any biological resource. This concludes my testimony.