Fire Summary Report to Northern Arizona University
& The Arizona Water Protection Fund,
Department of Water Resources
AWPF Grant # 98-050 WPF-02
"Watershed Restoration of a High Elevation Riparian Community"
The Nature Conservancy
Hart Prairie Preserve
18 November 2003

On Thursday, 10 April 2003, the US Forest Service initiated a controlled burn in the upper watershed on National Forest lands above Hart Prairie Preserve under the fire leadership of Walker Thornton, FMO for the Flagstaff Center. One staff member (Edward Smith) of The Nature Conservancy (TNC) partook in this prescribed burn for the duration of that day. We burned approximately 350 acres of prairie grassland as part of the project, and monitored the response of Bebb willows in the months subsequent to the burn to understand burn severity and to track viability of the surviving trees, and to watch for seedling recruitment as a result of the burn. The USFS also burned approximately 60 acres the following day, 50 of which were on USFS land and 10 acres of which were on TNC land. We monitored response of this area after the burn to observe scarlet gilia recruitment, noxious weed spread, and watershed condition in response to the prescribed fire activity.

We had also planned to conduct prescribed burns on TNC land, but after observing high mortality in the Bebb willows that were growing within the burn unit, we decided to wait until drought conditions had subsided or until we could remove accumulated fuels in the understory of the Bebb willows prior to conducting any more prescribed burns.

The prairie grassland area burned with low to moderate intensity, with good consumption of fine fuels and occasional torching of standing live and dead pine trees. Live trees were effectively killed or consumed where there was a "jackpot" or large accumulation of either old needles or new branches and needles left over from the thinning activity in the area. Ignition and mop up activities proceeded throughout the day until approximately 5:30 pm. I was unable to attend the prescribed burning activities on Fern Mountain and in the Bebb willow the following day, due to a previously arranged trip to the White Mountains of eastern Arizona. Coordination of efforts by the USFS was poor, and I was not informed of plans to burn either area until the evening of April 9, 2003. Apparently fire activity and intensity were much higher on April 11, due to warmer temperatures and higher wind speeds. I have not yet seen a report on the prescribed burn at Hart Prairie. After the burn, it was apparent that many willows had been completely involved in the fire, and some large conifers growing among the willows torched completely (see Figure 1, below).

Figure 1. Many Bebb willows and intervening conifers burned completely during the prescribed burn.

Walker Thornton indicated to me afterwards by phone that he had never seen bracken fern burn until this prescribed fire, in which some of the burning embers from the torching trees fell into the ferns in sufficient quantity. USFS personnel were also able to burn about 50 acres on the east side of Fern Mountain.

Monitoring:

Shortly after the burn, and since then on a monthly basis, I have observed the vegetation response to the burn (Figure 2). Many willows appeared to have been scorched to death for two to three months following the burn, but then initiated crown or root sprouting in August and September. Out of approximately 63 trees that were growing within the area that burned, approximately 22 (or 35%) were severely scorched to the point that either all of the biomass was consumed or there was no sign of living, green branches or leaves on those trees. However, 18 of those trees (or 29% of total trees; 82% of severely burned trees) had root or crown sprouting, indicating that the trees are still alive (Figures 3 & 4). Unfortunately, those trees are now being browsed by elk and deer, and the recovering areas need to be fenced. I am negotiating with USFS and Arizona Game & Fish to install a temporary protective fence around these sensitive areas until the Bebb willow trees gain sufficient height to be safe from browsing animals (Figure 5).

Figure 2. Most of the burned Bebb willows resprouted after 8-12 weeks of recovery.

Figure 3. Some of the willows have not resprouted after being burned in spring of 2003, and appear to have died.

Figure 4. Resprouting of willows following burning.

Figure 5. Although the root crowns are still alive and are resprouting, most of the sprouts have been browsed, presumably by deer and elk. These areas need to be fenced since we want the willows to persist.