

***Pre-restoration bird surveys at meadows
on the east slope of the Tahoe National
Forest and Plumas National Forest***

July 15, 2011

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Table of Contents

I. Abstract	1
II. Background	2
III. Methods	3
A. Monitoring Scheme	3
B. Site Selection	4
C. Crew Training And Certification	7
D. Data Collection	7
E. Data Analysis	9
IV. Results	9
V. Discussion	10
VI. Acknowledgments	20
VII. Literature Cited	20
VIII. Appendices	
A. Geographic coordinates of survey station locations	24
B. Maps of meadows with survey station locations	28
C. Number of birds detected during point counts at each meadow	41
D. Average number of birds detected during area searches at each meadow	58
E. All bird species detected during point counts and area searches at each meadow	73

ABSTRACT

With funding from the National Fish and Wildlife Foundation in 2009-2010, The Institute for Bird Populations developed a monitoring protocol to assess how bird populations respond to meadow restoration activities in the Sierra Nevada. During summer 2010 we field-tested the protocol by conducting pre-restoration bird surveys at 28 meadows proposed for restoration and 32 reference meadows in the Sierra Nevada. Study sites were identified in collaboration with personnel at National Forests, National Parks, California State lands, and private landowners. Monitoring visits included point count surveys, broadcast surveys, area searches, and vegetation and soil moisture assessments. This report describes results of the pre-restoration monitoring completed at 13 meadows (6 intended restoration sites, and 7 paired reference sites) on the Tahoe and Plumas National Forests. We surveyed all meadows twice during the 2010 breeding season, conducting a total of 212 point count and broadcast surveys, and over 35 person-hours of area searching. Results of these surveys will provide baseline information for assessing the effects of future restoration activities on bird populations at each of the 6 intended restoration sites.

BACKGROUND

Montane meadows in the Sierra Nevada form ecological islands within the surrounding forest matrix (Ratliff 1985, Fites-Kaufman et al. 2007). They provide abundant water, food, and cover for birds and other wildlife, and are among the most important breeding and foraging habitats for birds in the Sierra Nevada (Grinnell and Miller 1944, Orr and Moffit 1971, Gaines 1992, Graber 1996, Heath and Ballard 2003). However, at many Sierra meadows human activities and historic management practices have altered meadow hydrology, which in turn has changed the characteristics of meadow plant communities, and often diminished the value of meadow habitat for native bird populations (Klebenow and Oakleaf 1984, Allen-Diaz 1991, Kattlemann and Embury 1996, Cicero 1997, Siegel et al. 2008).

Throughout the Sierra Nevada, many public and private land managers are seeking win-win solutions for humans and wildlife by restoring or enhancing meadow habitats, in many cases addressing the historical legacy of hydrological impacts that have led to poorly watered meadows (Rood and Mahoney 1990, Loheide and Gorelick 2006, Skidmore et al. 2009). Restoring meadow hydrology is often a critical first step in restoring the full complement of native biodiversity to a meadow (Poff et al. 1997, Dwire et al. 2006).

Well-functioning hydrologic processes in montane meadows not only yield improved habitat for wildlife, but may also provide tangible benefits for humans, including:

- increased water storage capacity (Loheide and Gorelick 2006, Skidmore et al. 2009),
- improved water quality (Alexander et al. 2007, Simon et al. 2006),
- downstream flood attenuation (Gurnell et al. 1995, Skidmore et al. 2009),
- increased duration of summer flows (Alexander et al. 2007), and
- improved forage quality for livestock (Ratliff 1985).

One way to assess the success of meadow restoration is to monitor the responses of bird populations that inhabit the meadow. Birds can respond rapidly and dramatically to meadow restoration efforts, with populations of meadow-associated bird species increasing in or even colonizing meadows within as little as one year after restoration efforts are implemented (Taylor and Littlefield 1986, Larison et al. 2001, Stanley and Knopf 2002, McCreedy and Heath 2004, Heltzel and Earnst 2006, Borgmann 2010).

Each of the meadow-associated bird species that utilizes montane meadows in the Sierra Nevada has its own particular habitat needs, and the presence or absence of those specific habitat components largely predicts which species utilize a particular meadow (Wiens 1985). When meadow habitats are degraded the number of individual birds and the number of bird species occupying them tends to decline.

The primary objective of this project was to collect pre-restoration data on bird populations at meadows where future restoration projects are planned (and at associated reference sites). These data will allow assessment of the response of bird populations to future restoration activities. Such assessments are valuable both for documenting successes of restoration activities and for facilitating improvement of restoration techniques in an adaptive management context.

We used a draft bird survey protocol (Loffland et al. 2011) under development with funding from the National Fish and Wildlife Foundation designed specifically for pre- and post-restoration bird monitoring at meadow restoration sites. The protocol includes a combination of multi-species and single-species survey techniques, and incorporates point counts, species-specific broadcast surveys, area searches, and vegetation and soil moisture plots.

The use of a standardized survey protocol will help managers and researchers to glean important lessons from restoration monitoring efforts—lessons that cannot be learned from monitoring at any single site. Standardized data from diverse sites that undergo a variety of restoration measures will facilitate comparison of bird responses across sites and projects. Such comparisons will lead to an improved understanding of which restoration efforts most effectively produce high-quality bird habitat, and will allow future meadow restoration efforts to incorporate those findings.

METHODS

All of our methods adhered to Loffland et al.'s (2011) *Avian Monitoring Protocol for Sierra Nevada Meadows*. **Here we provide a cursory summary of methods, but readers seeking more detail or a discussion of the merits and limitations of particular methods should refer to the protocol itself.**

Monitoring Scheme

Loffland et al. (2011) suggest a BACI (Before, After, Control, Impact) monitoring scheme. Under this scheme all monitoring sites where restoration activities are planned are paired with one or more reference sites with similar hydrology and vegetation, but where no restoration activities are imminent. All monitoring activities are then conducted at both the restoration and reference sites in at least one year prior to restoration and at least one year after restoration. This design improves the manager's ability to separate local population changes that are the result of restoration from regional changes that may be due to annual weather variation or other factors. Comparing change in bird populations at the restoration site with the reference site will allow managers to see how individual bird species and suites of species respond to restoration activities, and how the response varies by type of restoration activity, locality, and, if multiple years of post-restoration monitoring are conducted, time since restoration activity (Smucker et al. 2005, Ward et al. 2010).

Site Selection

During early spring of 2010 we met with USDA Forest Service Region 5 staff to discuss how best to identify meadow restoration projects in the planning stage on National Forest lands, and worked closely with the Regional Hydrologist as he queried forests in Region 5. We also consulted with personnel at Yosemite and Sequoia/Kings Canyon National Parks and state agencies, and private landowners. We placed a higher priority on restoration projects that were already in the planning stage, but also included some sites that were identified as needing restoration, but for which the NEPA/CEQA process had not yet begun. Following guidance from the National Fish and Wildlife Foundation, we made restoration projects with a hydrologic component our highest priority. The resulting set of 30 restoration projects was distributed across 6 National Forests, 2 National Parks, 2 California State Wildlife Areas, 1 California State Park, and 1 private parcel. After identifying the restoration projects, we worked with local contacts to identify suitable reference sites to pair with each restoration site. These collaborations yielded 32 reference sites (in 2 instances multiple small sites were paired with a single restoration site). **This report details the subset of our 2010 study sites that were located on the east slope of the Tahoe and Plumas National Forests.**

Conversations with biologists and hydrologists on these 2 National Forests identified 7 meadow restoration projects in various stages of planning. With the exception of the Upper Bear Valley project, all restoration meadows described here have all planning complete and restoration activities were planned for 2010 or 2011. Likewise, these 5 meadows are also part of larger restoration plans that are treating multiple meadows within their respective watersheds. The Upper Bear Valley project has restoration needs identified, but is only in the beginning stage of planning. For each restoration site we selected 1 or more reference sites based on advice of local experts and through the review of aerial photography (Table 1; Figure 1).

Table 1. Restoration and associated reference sites on the east slope of the Tahoe and Plumas National Forests where pre-restoration bird surveys were conducted during the 2010 breeding season.

<i>Restoration Site (land manager)</i>	<i>Reference Site(s) (land manager)</i>
Carman Valley – Folchi (Tahoe N.F.)	Ross Ranch Meadow (Plumas N.F.)
Davies Creek – site 1 (Tahoe N.F.)	Trossi Canyon (Tahoe N.F.)
Perazzo Lower Meadow ^a (Tahoe N.F.)	Little Truckee below Stampede Res. (Tahoe N.F.)
Perazzo Middle Meadow (Tahoe N.F.)	Little Truckee above Stampede Res. (Tahoe N.F.)
Perazzo Terrace Meadow (Tahoe N.F.)	Little Truckee West (Tahoe N.F.)
Upper Bear Valley (Tahoe N.F.)	Lower Bear Valley (Tahoe N.F.)
West Carman Creek (Tahoe N.F.)	McNair Meadow (Plumas N.F.)

^aMeadow not surveyed in 2010 due to scheduling error.

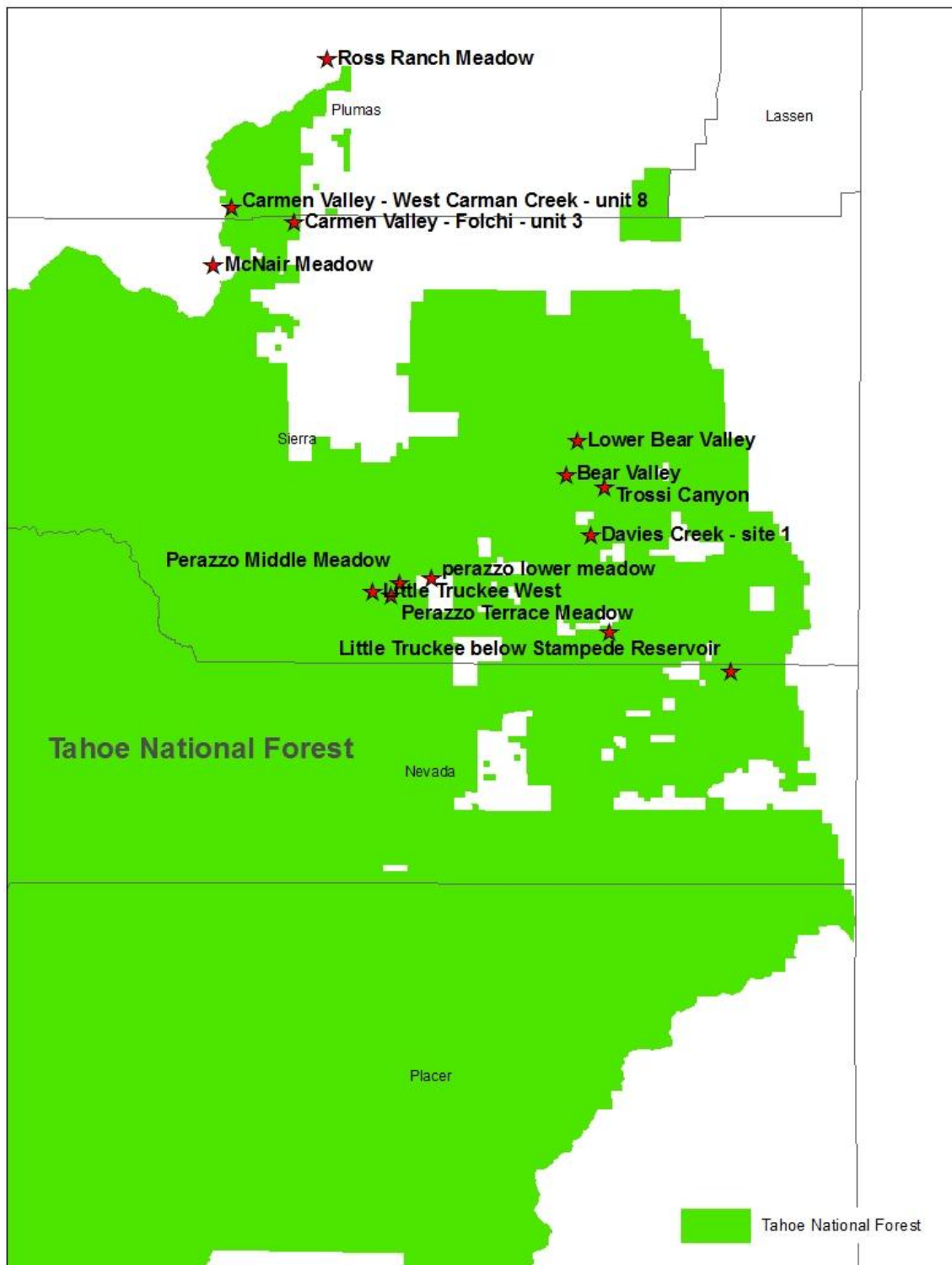


Figure 1. Locations of restoration and reference meadows surveyed for birds in 2010 on the east slope of the Tahoe and Plumas National Forests.

Carman Valley – Folchi and West Carman Creek are both part of a larger restoration program in the Carman Valley area. Their reference sites at Ross Ranch Meadow and McNair meadow are both nearby meadows just a few kilometers North and West of the restoration sites. These 4 sites occur at approximately 5000 ft (1524 m) in elevation and drain into the southern portion of the Feather River watershed on the western edge of the Sierra Valley. These meadows have similar historic use patterns as important grazing lands for cattle and sheep. The Carman Valley area has many historic railroad grades, borrow pits and roads bisecting it. Publicly owned large meadows at this elevation are relatively rare – sites like this were generally not incorporated into national forests when their boundaries were delineated, but were instead retained in private land ownership as base ranches for grazing allotments (Allen-Diaz et al. 1999). Additionally, many meadows of this type were popular with developers of residential and recreational areas. Likewise, even within the national parks, development of facilities often historically occurred in close proximity to meadows.

The Davies Creek meadow is one of a number of planned and completed restoration projects within a much larger restoration plan for the Davies Creek drainage in the North Eastern Part of the Little Truckee River Watershed. Davies creek and its reference meadow at Trossi Canyon occur farther east at slightly higher elevations between 6600 (1980 m) and 7300 ft (2286 m). Davies Creek is a stringer meadow that is somewhat restricted to the stream course by the geology of the drainage. Because so much of Davies Creek has undergone restoration, finding a nearby reference site was slightly more challenging. Trossi Canyon is less riparian in nature, with a wider, dry meadow type. Although only a few kilometers to the North of the restoration site, this meadow drains into the Feather River instead of the Little Truckee River. These 2 sites have both been influenced by a number of wild fires during the last 50 years.

The Upper Bear Valley meadow and its reference in Lower Bear Valley occur just north of the Davies Creek system but occur on a tributary to Smithneck Creek that drains into Sierra Valley and eventually into the Feather River. These meadows are part of a single large meadow/riparian system that parallels Bear Valley Creek. Although it is not ideal to have a reference site so closely linked to the restoration site we elected to pair these two areas. Because of severe stream incisement and the location of an established road within the flood plain, the Lower Bear Valley site is likely to remain degraded and provide good comparison to the restoration area in the upper portion of Bear Valley.

Perazzo Middle Meadow, Perazzo Lower Meadow, Perazzo Terrace, and the reference sites at Little Truckee West and along the Little Truckee River above and below Stampede Reservoir all occur within the vast floodplain of the Little Truckee River. These sites are on the east slope of the Sierra Nevada crest between approximately 5700 ft (1737 m) to 6600 ft (2012 m). This region has a long history as an intensively used travel corridor across the Sierra Nevada Crest and as an important livestock grazing area. In addition, water diversions occur to provide additional water into the Sierra Valley to the North. We originally identified and mapped survey stations for the restoration site at Perazzo Lower Meadow, but due to a scheduling error, this

site was not surveyed in 2010 (station locations are still included in Appendix A). Surveys were however conducted at its reference site at Little Truckee below Stampede Reservoir. At this time we are treating this reference site as an additional reference site for Perazzo Middle Meadow. The extra reference site allows for adjustment in the study design if areas we designated as references ultimately fall within other the restoration project areas.

All sites are surrounded by Sierra Mixed Conifer forest. Stands of Lodgepole Pine and occasionally Quaking Aspen are found along meadow edges. Occasionally areas of granite outcrop, or sagebrush chaparral make up a portion of the surrounding upland areas

Crew Training and Certification

All data were collected by full-time crew members working or volunteering for The Institute for Bird Populations. At the beginning of the 2010 field season, crew members underwent an intensive 3-week training session that followed the guidelines in Loffland et al. (2011) for ensuring surveyors are fully competent and qualified to collect reliable data. At the end of the training session all crew members passed a rigorous bird identification exam that tested the skills necessary to conduct point counts and area searches.

Data Collection

All sites were surveyed within the May 20-July 15 temporal window specified by the Loffland et al. (2011) protocol; at most meadows we were able to complete two full surveys (excluding the vegetation and soil moisture plots which we only completed once, in accordance with the survey protocol).

Establishing Survey Stations

At restoration and reference meadows we established survey stations 250 m apart along transects that followed the general course of stream channels within meadows, as well as in areas of meadows with no adjacent stream. Where possible, survey stations were placed at least 25 m from streams that were large enough to cause substantial noise interference during surveys – this will also help ensure that if stream restoration results in inundation or widening of the channel, survey stations do not end up under water in future years. In narrow meadows (<100 m wide), stations were placed every 250 m along a transect that traveled along the center of the meadow, regardless of where the stream channel was located. In most cases survey stations were delineated prior to the first field visit using digital aerial photos (DOQQs) and ArcMap software. Geographic coordinates of individual survey stations are provided in Appendix A and site maps with survey station locations are provided in Appendix B. In a few instances stations were inaccessible due to the unusually high water conditions in June and July of 2010. For those stations that could not be reasonably relocated to a more accessible area nearby, surveys were not completed in 2010. Nonetheless, their

coordinates remain in Appendix A, and the points should be surveyed if possible during future monitoring visits.

Point Counts

We utilized 10-minute point counts, divided into 4 smaller time intervals to facilitate estimating detection probability and modeling occupancy rates (MacKenzie et al. 2002) in the future, if desired. All birds were classified as being either ≤ 50 m from the survey station at first detection, or at a distance >50 m.

Species-Specific Broadcast Surveys

Immediately following each 10-min point count, we remained at the survey station and conducted broadcast surveys for 3 rare or hard to detect species that may be particularly likely to respond to meadow restoration efforts: Willow Flycatcher, Sora, and Virginia Rail. Vocalizations for a particular species were broadcast only if we did not first detect the species within 50 m of the survey station during the preceding 10-minute point count.

Area Searches

When all of the point count and broadcast surveys were completed, surveyors remained at the meadow and began the area search portion of the survey. The amount of time spent area searching was dependent on the size of the meadow; surveyors spent at least 10 minutes area-searching for every survey station the meadow accommodated. One of the objectives of the areas search was to increase the likelihood of detecting rarer or more secretive species that were present at the site, particularly species that may have been missed during the point count and broadcast portions of the survey. When conducting the area search, surveyors moved through the meadow slowly and quietly, counting all birds detected at the site. Special attention was paid to areas along stream channels or other flooded/ponded areas, and locations where restoration activities were planned. Additionally, areas of the meadow where sight and sound were obstructed by dense vegetation were observed carefully. Although more time may have been spent in these specific portions of the meadow, all areas and vegetation communities were systematically covered. We tallied individual birds based on their location at the time of first detection, either within the meadow, or within the surrounding forest or other upland vegetation community.

Vegetation and soil moisture plots

After completing bird surveys we assessed the vegetative structure and vegetative community types at each survey station to characterize the meadow and provide context for bird survey results. We recorded relative cover and vegetation height for a variety of vegetative and surface water components in each of the four quadrants formed by four 50-m transects extending away from the station in each of the cardinal directions (N, S, E, W). . For each quadrant (NW, NE, SE, SW), we recorded cover for

each vegetation type after first walking the quadrant to observe the entire area. Cover was estimated as if one was looking down on the site from above. Totals of all cover types combined sometimes exceeded 100% because values were combined over multiple overlapping levels of the canopy: herbaceous, shrub, and tree.

Data Analysis

Because only one year of baseline monitoring has been completed, the analysis reported here is relatively simple. From point count results at each meadow, we tabulated the number of species detected, the number of individuals of each species detected, and the number of individuals detected per point for all species combined. Results are provided separately for birds detected within 50 m of the survey station, and birds detected at any distance from the survey station. From area search results we provide numbers of individuals of each species, as well as the number of additional species detected that were not detected during point count surveys. We also tallied total number of individuals (of all species combined) counted and total number of species detected as the average across both visits (when two visits were completed). From broadcast surveys, we report the number, species and locations of any target species detected. Mean vegetation measurements are reported at the meadow scale, and are intended to characterize the areas of the meadows where we conducted point counts and broadcast surveys.

RESULTS

During the late winter and early spring of 2010 the Sierra Nevada experienced heavier than average snowfall, and unusually late snowmelt. These conditions made planning and implementation of the monitoring work more difficult because many sites and access roads were under snow well into June and, in some cases, July. Many of our monitoring efforts had to be delayed until sites became accessible. Nonetheless, we were able to visit all sites at least once during our survey window of May 20 through July 15 (Table 2). Loffland et al. (2011) encourages two visits, but the second visit is considered optional. In total, 6 restoration sites, and 7 reference sites (13 total) within the east slope Tahoe N.F. and Plumas N.F. region received at least one visit during 2010 breeding season. We established 212 survey stations at the 13 study sites.

Table 2. Site location information and survey dates for meadows on the east slope of Tahoe and Plumas National Forests.

Meadow Name^a	Site Type	UTM Easting	UTM Northing	UTM Zone	Elev. (ft)	USGS Quadrangle	Visit 1 Date	Visit 2 Date	No. of Survey Stations
Carman Valley -Folchi	Restore	720521	4398617	10	4950	Calpine	5/30/2010	6/21/2010	16
Ross Ranch Meadow	Reference	721650	4409434	10	4941	Portola	6/2/2010		10
Davies Creek - Site 1	Restore	740198	4378349	10	6600	Sardine Peak	6/10/2010	7/8/2010	5
Trossi Canyon	Reference	741287	4381473	10	7300	Sardine Peak	6/10/2010	7/8/2010	5
Perazzo Lower Meadow	Restore	730236	4375110	10	6400	Independence Lk			6
Little Truckee below Stampede Res.	Reference	749084	4371765	10	5700	Boca	6/7/2010	7/7/2010	14
Perazzo Middle Meadow	Restore	727686	4374787	10s	6450	Independence Lk	6/19/2010	7/11/2010	16
Little Truckee above Stampede Reservoir	Reference	741816	4371881	10	5950	Hobart Mills	6/29/2010	7/11/2010	6
Perazzo Terrace Meadow	Restore	727127	4373922	10	6550	Independence Lk	6/19/2010	7/11/2010	6
Little Truckee West	Reference	726164	4374278	10	6550	Independence Lk	6/19/2010	7/11/2010	5
Upper Bear Valley	Restore	738398	4382653	10	6600	Sardine Peak	6/8/2010	6/27/2010	10
Lower Bear Valley	Reference	738942	4383787	10	6450	Sardine Peak	6/8/2010	6/27/2010	8
West Carman Creek	Restore	716146	4399111	10	5000	Calpine	6/1/2010	6/21/2010	9
McNair Meadow	Reference	715332	4395162	10	5300	Calpine	5/31/2010		6

^aRestoration sites are indicated in bold text with associated reference sites directly below them in plain text.

Point Counts

Among the meadows with survey results reported here, Perazzo Middle Meadow showed the greatest species richness, with Little Truckee below Stampede Reservoir and Carmen – Folchi, close behind (Table 3). These are 3 of the largest meadows monitored in the survey region. The relatively high number of survey stations resulted in a greater diversity of habitat conditions surveyed, including varied riparian and upland habitats at the periphery of the survey area. A large variety of habitats usually results in greater species richness. When only the results within 50 m of survey stations were included and the number of individuals was averaged across the number of stations, some of the effects of meadow size were diminished. Results for these metrics were variable across all sites and showed no obvious pattern (Table 3).

Table 3. Number of individual birds and number of species detected during point count surveys at all study sites.

<i>Meadow Name^a</i>	<i>No. of Survey Stations</i>	<i>Avg. No. Birds Detected^b</i>		<i>Avg. No. Birds Per Station^b</i>		<i>Species Detected (Visits Pooled)</i>	
		<i><50m</i>	<i>Unlimited Radius</i>	<i><50m</i>	<i>Unlimited Radius</i>	<i><50m</i>	<i>Unlimited Radius</i>
Carman Valley -Folchi	16	28.5	275.5	1.8	17.2	13	49
Ross Ranch Meadow	10	6.0	180.0	0.6	18.0	5	34
Davies Creek - Site 1	5	34.5	91.0	6.9	18.2	24	39
Trossi Canyon	5	20.0	72.0	4.0	14.4	17	30
Perazzo Middle Meadow	16	66.0	295.0	4.1	18.4	34	55
Little Truckee above Stampede Res.	4	27.5	81.5	6.9	20.4	19	30
Little Truckee below Stampede Res.	14	65.5	239.5	4.7	17.1	30	49
Perazzo Terrace Meadow	6	9.5	135.5	1.6	22.6	10	40
Little Truckee West	5	13.0	62.5	2.6	12.5	16	38
Upper Bear Valley	10	69.5	184.0	6.9	18.4	30	40
Lower Bear Valley	8	59.0	158.0	7.4	19.8	27	42
West Carman Creek	9	26.0	148.5	2.9	16.5	16	42
McNair Meadow	6	36.0	126.0	6.0	21.0	17	34

^aRestoration sites are indicated in bold text with associated reference sites directly below them in plain text. ^bValues for numbers of birds and number of birds per stations are reported for individuals detected within a 50m radius of the survey station and for all individuals detected at all distances from the station (unlimited radius). Number of birds detected and number of birds per station are reported as the mean value averaged across 2 visits, except for sites where only one visit was completed.

Loffland et al. (2011) identify 18 meadow-associated focal species. These species were selected because of their affinity to meadow and riparian communities, and based on the expectation that their numbers would increase if meadow restoration efforts improved the quantity or quality of habitat components important to them. One exception is the Brown-headed Cowbird. While often found in meadows, this species also uses many other open or disturbed habitats with human or livestock use. Brown-headed Cowbirds were selected by Loffland et al. (2011) as focal species because of the role they play as nest parasites of other meadow-associated birds, and the

association between their relative abundance and human disturbance. Of the 18 focal species identified for Sierra Nevada meadows, 13 were detected during point counts in the east slope Tahoe N.F. and Plumas N.F. study region (Table 4).

The number of focal species detected at a given site ranged from a low of 3 at Davies Creek - Site 1 to a high of 13 at Perazzo Middle Meadow. Of the focal species detected, Wilson's Snipe was only detected at 1 site, while Red-breasted Sapsucker and Brown-headed cowbird were detected at 12 sites. Each of the remaining focal species was detected at 2 or more of the 13 meadows. The average number of individuals detected for each species, and the average number per survey station, are reported for all species at each restoration site and its associated reference site(s) in Appendix C.

Table 4. Relative abundance^a of strongly meadow-associated focal bird species at each meadow. Focal species were identified by Loffland et al. (2011).

<i>Meadow Name^b</i>	<i>Survey radius</i>	<i>Virginia Rail</i>	<i>Sandhill Crane</i>	<i>Spotted Sandpiper</i>	<i>Wilson's Snipe</i>	<i>Red-breasted Sapsucker</i>	<i>Willow Flycatcher</i>	<i>Warbling Vireo</i>	<i>Swainson's Thrush</i>	<i>Yellow Warbler</i>	<i>MacGillivray's Warbler</i>	<i>Wilson's Warbler</i>	<i>Song Sparrow</i>	<i>Lincoln's Sparrow</i>	<i>White-Crowned Sparrow</i>	<i>Brown-headed Cowbird</i>
Carmen Valley - Folchi	≤50m Unlim.	0.00 0.00	0.00 0.38	0.00 0.00	0.00 0.28	0.00 0.09	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.03	0.06 0.31	0.00 0.00	0.00 0.28
Ross Ranch Meadow	≤50m Unlim.	0.00 0.00	0.00 0.3	0.00 0.00	0.00 0.00	0.00 0.10	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.10	0.00 0.00	0.10 0.80
Davies Creek - Site 1	≤50m Unlim.	0.00 0.00	0.00 0.00	0.00 0.00	0.10 0.10	0.10 0.30	0.00 0.00	0.30 0.60	0.00 0.00	0.50 0.70	0.20 0.40	0.00 0.00	0.40 0.50	0.00 0.00	0.70 1.40	0.10 0.10
Trossi Canyon	≤50m Unlim.	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.10	0.00 0.00	0.10 0.70	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.10	0.10 0.10	0.10 0.50	0.00 0.00
Perazzo Middle Meadow	≤50m Unlim.	0.03 0.09	0.00 0.00	0.25 0.91	0.03 0.84	0.13 0.13	0.03 0.22	0.06 0.53	0.00 0.00	0.59 1.75	0.09 0.16	0.06 0.47	0.28 1.34	0.16 0.56	0.38 1.66	0.06 0.38
Little Truckee above Stampede Res.	≤50m Unlim.	0.00 0.00	0.00 0.00	0.13 0.88	0.00 0.00	0.38 0.38	0.00 0.25	0.25 0.38	0.00 0.00	1.00 2.75	0.00 0.00	0.00 0.13	1.38 2.75	0.00 0.00	0.13 0.88	0.13 0.75
Little Truckee below Stampede Res.	≤50m Unlim.	0.00 0.00	0.00 0.00	0.29 0.50	0.00 0.00	0.04 0.04	0.00 0.00	0.00 0.18	0.00 0.00	0.61 1.46	0.11 0.25	0.00 0.11	0.50 1.68	0.00 0.11	0.25 0.50	0.32 0.71
Perazzo Terrace Meadow	≤50m Unlim.	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.58	0.00 0.33	0.00 0.00	0.00 1.33	0.00 0.08	0.00 0.33	0.17 0.50	0.00 0.42	0.00 0.17	0.00 1.17	0.33 3.17	0.08 1.25
Little Truckee West	≤50m Unlim.	0.00 0.00	0.00 0.00	0.10 0.20	0.00 0.00	0.10 0.10	0.00 0.00	0.20 0.90	0.00 0.00	0.10 0.70	0.00 0.00	0.00 0.10	0.20 0.50	0.30 0.40	0.20 1.10	0.00 0.20
Upper Bear Valley	≤50m	0.00	0.00	0.05	0.20	0.00	0.00	0.25	0.00	0.45	0.00	0.05	0.35	0.00	0.10	0.15

<i>Meadow Name^b</i>	<i>Survey radius</i>	<i>Virginia Rail</i>	<i>Sandhill Crane</i>	<i>Spotted Sandpiper</i>	<i>Wilson's Snipe</i>	<i>Red-breasted Sapsucker</i>	<i>Willow Flycatcher</i>	<i>Warbling Vireo</i>	<i>Swainson's Thrush</i>	<i>Yellow Warbler</i>	<i>MacGillivray's Warbler</i>	<i>Wilson's Warbler</i>	<i>Song Sparrow</i>	<i>Lincoln's Sparrow</i>	<i>White-Crowned Sparrow</i>	<i>Brown-headed Cowbird</i>
Lower Bear Valley	Unlim.	0.00	0.00	0.15	0.30	0.00	0.00	0.45	0.00	0.70	0.00	0.10	1.05	0.00	0.85	0.20
	≤50m	0.00	0.00	0.00	0.00	0.13	0.00	0.63	0.00	0.50	0.00	0.00	0.75	0.00	0.19	0.25
	Unlim.	0.00	0.00	0.00	0.00	0.19	0.00	1.31	0.00	0.94	0.13	0.06	1.31	0.06	0.56	0.25
West Carman Creek	≤50m	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.06	0.11	0.00	0.11
	Unlim.	0.00	0.28	0.00	0.00	0.17	0.00	0.33	0.00	0.06	0.00	0.00	0.83	0.39	0.00	0.33
McNair Meadow	≤50m	0.00	0.00	0.00	0.00	0.17	0.00	0.17	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00
	Unlim.	0.00	0.00	0.00	0.00	0.33	0.00	0.50	0.17	0.00	0.17	0.00	0.00	0.83	0.00	0.33

^aNumber of individuals of each species divided by the number of visits and number of survey points, based on all detections within 50m of a survey point, and at unlimited distance. ^bRestoration sites are indicated with bold type.

Broadcast Surveys

Broadcast surveys for Sora, Virginia Rail, and Willow Flycatcher were completed at all survey stations. Vocalizations were only broadcast if the species was not spontaneously singing or calling within 50m of the survey station during the preceding point count. Virginia Rails responded at survey stations 8 and 9 at Perazzo Middle Meadow on 6/19/2010. Willow Flycatchers responded at survey stations 1, 8, 12, and 13 at Perazzo Middle Meadow on 6/19/2010 and 7/11/2010. A Willow Flycatcher responded at survey station 5 at Little Truckee above Stampede Reservoir on 6/29/2010. Both of these sites were known to support Willow Flycatchers in 2010 prior to our monitoring visits. No other target species were detected using broadcast surveys.

Area Searches

In most cases, we conducted area searches immediately following point count and broadcast surveys, but no later than 4.5 hours after sunrise. At large meadows, area searches were sometimes completed by a separate observer concurrent with point count surveys. In all but a few cases area searches were completed on the same morning as point counts. Area searches resulted in the mean detection of 6.5 (SD = 3.2) additional species per meadow in the east slope Tahoe N.F. and Plumas N.F. study region, over species totals based on point count surveys alone (Table 5). Species-specific area search results for each restoration site and its associated reference site are provided in Appendix D. Appendix E contains a list of all species detected (point counts and areas searches combined) at each meadow.

Table 5. Number of species detected using area search and point count results^a.

<i>Meadow Name^b</i>	<i>No. Species Detected - Area Searches</i>	<i>No. Species Detected - Point Counts</i>	<i>No. Species Detected Only During Area Searches</i>	<i>No. Species - Both Methods Combined</i>
Carmen Valley Folchi	42	49	4	53
Ross Ranch Meadow	42	34	13	47
Davies Creek - Site 1	39	39	8	47
Trossi Canyon	27	30	3	33
Perazzo Middle Meadow	52	55	8	63
Little Truckee above Stampede Res.	28	30	3	33
Little Truckee below Stampede Res.	43	49	3	52
Perazzo Terrace Meadow	47	40	9	49
Little Truckee West	30	38	3	41
Upper Bear Valley	48	40	10	50
Lower Bear Valley	35	42	6	48
West Carman Creek	44	42	7	49
McNair Meadow	29	34	7	41

^aResults are pooled across all visits. ^bRestoration sites indicated in bold text.

Vegetation Assessment

Vegetation and water measurements were collected at each survey station for the purpose of assessing the 50-m radius area surrounding each survey station, and to provide information characterizing the general vegetation communities and hydrologic conditions within the overall meadow. Table 6 provides the average cover values for each meadow, calculated from the means of the four quadrants at each survey station.

Tree and snag cover was greatest at smaller sites where the forest edge regularly fell within 50 m of the survey stations. Trossi Canyon had 23% tree cover at survey stations, but the remaining meadows had values at or below approximately 10%. Tree cover within the meadow can be an indicator of lowered water tables and conifer encroachment. Although meadow associated birds will utilize trees for foraging and territory advertisement, brown-headed cowbirds and nest predators also use trees within the meadow as hunting perches. Riparian shrub cover within the 50-m plots averaged 12.6 % (S.E. = 1.85). Extent of shrub cover is particularly important for many shrub-nesting bird species. Sagebrush cover, often an indicator of lowered water tables, averaged 28.2% across the study area, but was approximately 50% of plots at Carman Valley – Folchi, Trossi Meadow, and Little Truckee below Stampede Reservoir.

We quantified the amount of flowing and standing water around survey stations to assess habitat quality for bird species that are associated with water or saturated conditions. Water cover from flowing or standing water did not exceed 8% at any site (Table 6).

Table 6. Average vegetative and water cover characteristics for 50-m plots surrounding survey stations at each meadow. Meadows not listed did not receive vegetation assessments.

<i>Meadow Name^a</i>	<i>No. Stations</i>	<i>Measure^b</i>	<i>Percent Cover</i>								
			<i>Trees</i>	<i>Snags</i>	<i>Riparian Shrubs</i>	<i>Sagebrush</i>	<i>Non-Woody Vegetation</i>	<i>Bare Ground</i>	<i>Gravel Bar</i>	<i>Flowing Water</i>	<i>Standing Water</i>
Carman Valley – Folchi	16	Mean	2.39	0.00	0.00	43.59	51.38	14.27	0.00	0.00	1.08
		(S.E.)	1.16	0.00	0.00	4.39	6.10	3.87	0.00	0.00	0.60
Davies Creek - Site 1	5	Mean	7.30	0.25	30.15	30.50	87.10	5.70	0.00	2.05	3.60
		(S.E.)	3.56	0.16	5.33	3.38	1.48	0.64	0.00	0.46	1.13
Trossi Canyon	5	Mean	23.05	0.70	3.90	50.85	42.65	6.90	0.40	3.10	7.45
		(S.E.)	9.61	0.35	3.90	13.70	13.05	2.19	0.26	1.25	2.88
Perazzo Middle Meadow	16	Mean	3.66	0.14	21.39	6.59	74.05	1.67	0.84	7.30	4.17
		(S.E.)	1.42	0.06	3.97	2.20	6.23	0.46	0.23	2.44	1.29
Little Truckee above Stampede Res.	1	Mean	2.00	0.25	77.50	0.00	5.00	5.00	2.25	0.00	0.00
		(S.E.)	.	.	.	.	.	.	.	.	.
Little Truckee below Stampede Res.	13	Mean	2.65	0.10	13.40	46.58	51.44	10.71	7.04	2.33	0.58
		(S.E.)	1.01	0.07	2.34	6.11	6.25	2.25	1.86	1.00	0.42
Perazzo Terrace Meadow	6	Mean	2.08	0.50	11.33	30.04	50.46	6.25	0.00	1.67	2.46
		(S.E.)	0.89	0.37	10.99	16.11	16.65	1.46	0.00	0.58	2.02
Little Truckee West	4	Mean	0.81	0.00	4.13	5.56	84.75	14.00	1.25	2.13	0.69
		(S.E.)	0.81	0.00	1.58	4.47	6.38	5.66	1.25	1.33	0.69
Upper Bear Valley	10	Mean	4.33	0.23	8.80	25.50	86.08	4.18	0.08	1.10	3.28
		(S.E.)	2.79	0.17	4.89	5.23	4.38	1.13	0.08	0.44	1.51
Lower Bear Valley	9	Mean	12.19	1.58	26.50	36.53	48.75	6.25	1.53	4.33	2.64
		(S.E.)	4.46	0.77	8.53	5.06	6.59	0.88	0.60	0.45	0.36
West Carman Creek	9	Mean	8.61	0.08	1.08	5.78	81.42	17.08	1.39	0.11	1.81
		(S.E.)	2.83	0.04	0.61	2.40	8.59	7.76	0.96	0.11	0.57
11 Sites Pooled	94	Mean	5.65	0.31	12.61	28.23	63.86	8.59	1.50	2.58	2.52
		(S.E.)	0.98	0.09	1.85	2.50	2.91	1.17	0.36	0.51	0.39

^aRestoration sites indicated in bold text. ^bMean and standard error averaged over four 50-m radius quadrants at each survey station.

For those survey stations with riparian deciduous shrub cover, we also assessed the proportion of the shrub occurring within different height and age classes, as well as taxonomic group (Table 7). Immature shrubs in the lowest height class are indicative of shrub recruitment, an important factor in maintaining suitable habitat for shrub-nesting birds. Mature shrubs in the shortest height class can indicate certain low growing species, as well as situations where livestock or native ungulates are regulating growth patterns. These factors, as well as the proportion of the shrub community in the taller height classes, are relevant to certain focal bird species that prefer to nest at heights greater than 1 m above the ground. For all sites combined, the majority of riparian shrubs (65 %) were > 2m tall, and 26% were in the 1 – 2 m height class. Only one site, Little Truckee West, had more than 5% of riparian shrubs in the seedling size class (22%)(Table 7). When pooling sites willow was the predominant shrub group (95%).

Table 7. Average characteristics of riparian deciduous shrubs in 50-m plots surrounding survey stations. Study sites not listed had no riparian deciduous shrubs within survey plots.

<i>Meadow Name^a</i>	<i>No. Stations</i>	<i>Measure^b</i>	<i>Height and Age Class of Riparian Shrubs (%)</i>				<i>Taxonomic Composition of Riparian Shrubs</i>		
			<i><1m (seedling)</i>	<i><1m (mature)</i>	<i>1 - 2m</i>	<i>>2m</i>	<i>% Willow</i>	<i>% Alder</i>	<i>% Other Riparian Shrub</i>
Davies Creek - Site 1	5	Mean	0.10	10.25	44.25	45.40	100.00	0.00	0.00
		(S.E.)	0.10	2.52	7.33	7.64	0.00	0.00	0.00
Trossi Canyon	1	Mean	2.50	0.00	3.75	93.75	100.00	0.00	0.00
		(S.E.)	.	.	.	.	.	.	.
Perazzo Middle Meadow	13	Mean	2.04	11.04	30.77	56.15	94.27	0.00	5.73
		(S.E.)	0.95	2.74	7.68	7.11	3.17	0.00	3.17
Little Truckee Above Stampede Res.	1	Mean	0.00	0.00	10.00	90.00	100.00	0.00	0.00
		(S.E.)	.	.	.	.	.	.	.
Little Truckee Below Stampede Res.	13	Mean	2.96	3.54	12.72	80.77	100.00	0.00	0.00
		(S.E.)	1.30	1.47	3.26	5.37	0.00	0.00	0.00
Perazzo Terrace Meadow	3	Mean	1.67	3.75	40.83	53.75	100.00	0.00	0.00
		(S.E.)	1.67	3.75	30.29	29.11	0.00	0.00	0.00
Little Truckee West	3	Mean	22.08	0.00	34.17	52.08	100.00	0.00	0.00
		(S.E.)	12.63	0.00	22.84	28.94	0.00	0.00	0.00
Upper Bear Valley	6	Mean	2.78	2.78	29.65	64.79	100.00	0.00	0.00
		(S.E.)	2.78	2.78	15.38	15.45	0.00	0.00	0.00
Lower Bear Valley	9	Mean	3.75	4.86	21.90	69.49	88.89	0.00	11.11
		(S.E.)	0.89	0.93	4.59	4.94	11.11	0.00	11.11
West Carman Creek	4	Mean	0.00	0.00	25.00	75.00	75.00	0.00	25.00
		(S.E.)	0.00	0.00	25.00	25.00	25.00	0.00	25.00
9 Sites Pooled	58	Mean	3.24	5.39	25.84	65.39	94.26	0.00	4.73
		(S.E.)	0.93	0.94	3.60	3.83	2.57	0.00	2.50

^aRestoration sites are in bold text. ^bMean and standard error averaged over four 50m-radius quadrants at each survey station.

DISCUSSION

We strongly recommend continuing bird monitoring activities at meadows in the east slope Tahoe N.F. and Plumas N.F. region in as many pre- and post-restoration years as feasible. One way that we might alter monitoring methods from what was completed in 2010 would be to decrease the distance between survey stations to as little as 200 m if doing so would allow for the addition of even one more survey station at small meadows. Many of the meadows we visited in other regions in 2010 contained 3 or fewer survey stations. These small sample sizes can be problematic for some analyses, and if one or more stations can be added it could strengthen the monitoring results. Nevertheless we do not recommend altering station locations for the sites listed in this report where surveys occurred in 2010. Rather, any new reference or restoration sites that would contain 5 or fewer stations using 250-m spacing could benefit from maximizing the number of stations. We also assessed our 2010 results and decided that decreasing point count duration from 10 minutes to 7 minutes would provide reliable results while balancing the amount of time and effort necessary per point count. In addition, we did not find much benefit from species-specific broadcast surveys for Willow Flycatcher, Sora and Virginia Rail. Not surprisingly, these species were not often detected at sites in need of restoration, but even when detected there were only 3 instances during our surveys across the entire Sierra Nevada where broadcast surveys detected an individual that had not already been detected during point counts. While single-species broadcast surveys may still be useful for some projects, detection probabilities of Sora and Virginia Rail may be adequately high with passive survey methods that do not incorporate broadcasts, and Willow Flycatchers are likely to be surveyed with full-protocol surveys (Bombay et al. 2003) prior to restoration as part of the state and federal permitting processes.

ACKNOWLEDGMENTS

This project was made possible by funding from the National Fish and Wildlife Foundation. We thank Kris Boatner, Tina Mark, Russell Nickerson, Jeff TenPas, Randy Westmoreland, and Craig Wilson for their assistance in identifying suitable restoration and reference sites, and their help with determining when site access would be possible. We thank our field crew for collecting the data: Jade Ajani, Adam Baz, Sara Cendejas-Zarelli, Callie Dahmen, Henry Pollock, and Lisa Vormwald (crew leader). We thank Mandy Holmgren and Lisa Vormwald for data entry. This project was conducted by The Institute for Bird Populations' Sierra Nevada Bird Observatory and is Contribution No. 414 of The Institute for Bird Populations.

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Appendix A. Geographic coordinates of survey station locations

Table A-1. Geographic coordinates of survey station locations^a.

Meadow Name	Station Number	UTM Zone	UTM Easting	UTM Northing
Carman Valley - Folchi	01	10	720007	4397569
Carman Valley - Folchi	02	10	720099	4397813
Carman Valley - Folchi	03	10	720156	4398056
Carman Valley - Folchi	04	10	720128	4398284
Carman Valley - Folchi	05	10	720001	4398500
Carman Valley - Folchi	06	10	720120	4398723
Carman Valley - Folchi	07	10	720350	4398825
Carman Valley - Folchi	08	10	720380	4399062
Carman Valley - Folchi	09	10	720351	4397886
Carman Valley - Folchi	10	10	720428	4398113
Carman Valley - Folchi	11	10	720482	4398364
Carman Valley - Folchi	12	10	720275	4398526
Carman Valley - Folchi	13	10	719816	4397699
Carman Valley - Folchi	14	10	719838	4397949
Carman Valley - Folchi	15	10	719864	4398175
Carman Valley - Folchi	16	10	719763	4398520
Davies Creek - Site 1	01	10	740722	4378333
Davies Creek - Site 1	02	10	740473	4378361
Davies Creek - Site 1	03	10	740220	4378332
Davies Creek - Site 1	04	10	739971	4378328
Davies Creek - Site 1	05	10	739754	4378464
Lower Bear Valley	01	10	738793	4385117
Lower Bear Valley	02	10	738879	4384883
Lower Bear Valley	03	10	739011	4384671
Lower Bear Valley	04	10	739120	4384456
Lower Bear Valley	05	10	739128	4384171
Lower Bear Valley	06	10	739038	4383935
Lower Bear Valley	07	10	738903	4383710
Lower Bear Valley	08	10	738859	4383461
Lower Bear Valley	09	10	738732	4383249
Little Truckee Above Stampede Res.	01	10	741982	4371963
Little Truckee Above Stampede Res.	02	10	741748	4371867
Little Truckee Above Stampede Res.	03	10	741509	4371799
Little Truckee Above Stampede Res.	04	10	742131	4371769
Little Truckee Above Stampede Res.	05	10	741623	4372070
Little Truckee Above Stampede Res.	06	10	741416	4372194
Little Truckee Below Stampede Res.	01	10	750242	4369347
Little Truckee Below Stampede Res.	02	10	750036	4369473
Little Truckee Below Stampede Res.	03	10	749816	4369600
Little Truckee Below Stampede Res.	04	10	749637	4369776
Little Truckee Below Stampede Res.	05	10	749520	4369999
Little Truckee Below Stampede Res.	06	10	749404	4370220
Little Truckee Below Stampede Res.	07	10	749288	4370439
Little Truckee Below Stampede Res.	08	10	749173	4370663
Little Truckee Below Stampede Res.	09	10	749193	4370921
Little Truckee Below Stampede Res.	10	10	749224	4371168
Little Truckee Below Stampede Res.	11	10	749263	4371494
Little Truckee Below Stampede Res.	12	10	749192	4371735
Little Truckee Below Stampede Res.	13	10	749129	4371978

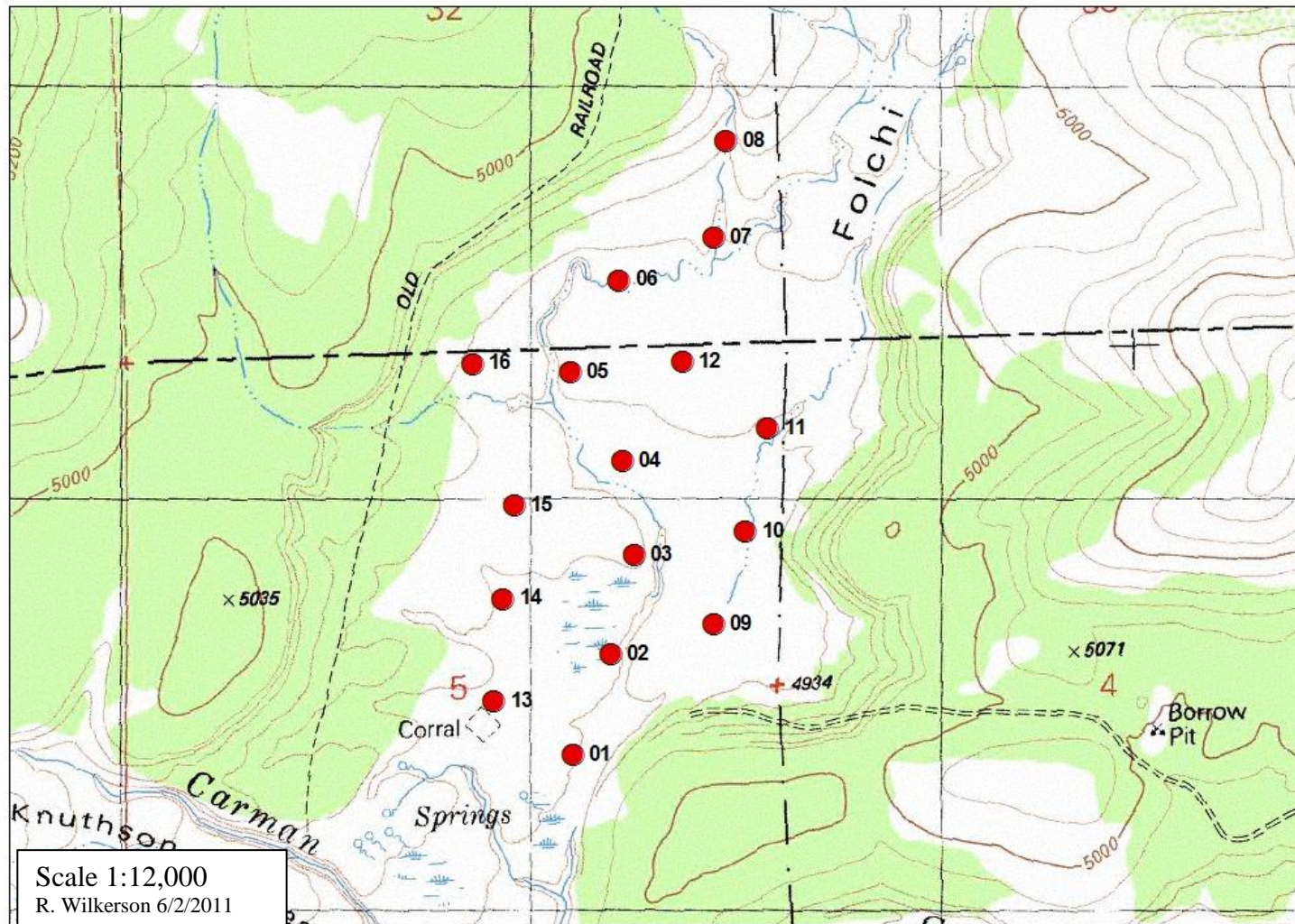
Meadow Name	Station Number	UTM Zone	UTM Easting	UTM Northing
Little Truckee Below Stampede Res.	14	10	749057	4372220
Little Truckee Below Stampede Res.	15	10	749067	4372492
Little Truckee West	02	10	725756	4374108
Little Truckee West	03	10	726058	4374138
Little Truckee West	04	10	726267	4374323
Little Truckee West	05	10	726296	4374124
McNair Meadow	01	10	714709	4395162
McNair Meadow	02	10	714962	4395145
McNair Meadow	03	10	715211	4395151
McNair Meadow	04	10	715448	4395222
McNair Meadow	05	10	715689	4395281
McNair Meadow	06	10	715900	4395403
Perazzo Lower Meadow	1	10	730331	4374950
Perazzo Lower Meadow	2	10	730143	4375116
Perazzo Lower Meadow	3	10	729909	4375207
Perazzo Lower Meadow	4	10	729657	4375211
Perazzo Lower Meadow	5	10	729422	4375125
Perazzo Middle Meadow	01	10	729026	4375055
Perazzo Middle Meadow	02	10	728781	4375069
Perazzo Middle Meadow	03	10	728527	4375075
Perazzo Middle Meadow	04	10	728279	4375073
Perazzo Middle Meadow	05	10	728067	4374941
Perazzo Middle Meadow	06	10	727855	4374799
Perazzo Middle Meadow	07	10	727638	4374680
Perazzo Middle Meadow	08	10	727432	4374569
Perazzo Middle Meadow	09	10	727221	4374415
Perazzo Middle Meadow	10	10	726988	4374335
Perazzo Middle Meadow	11	10	726763	4374393
Perazzo Middle Meadow	12	10	726526	4374465
Perazzo Middle Meadow	13	10	728816	4374818
Perazzo Middle Meadow	14	10	728550	4374821
Perazzo Middle Meadow	15	10	728294	4374823
Perazzo Middle Meadow	16	10	728067	4374684
Perazzo Middle Meadow	17	10	727811	4374998
Perazzo Terrace Meadow	01	10	727578	4374304
Perazzo Terrace Meadow	02	10	727417	4374158
Perazzo Terrace Meadow	03	10	727300	4373964
Perazzo Terrace Meadow	04	10	727297	4373716
Perazzo Terrace Meadow	05	10	727071	4373880
Perazzo Terrace Meadow	06	10	726822	4373910
Ross Ranch Meadow	01	10	721735	4410486
Ross Ranch Meadow	02	10	721690	4410242
Ross Ranch Meadow	03	10	721609	4410006
Ross Ranch Meadow	04	10	721595	4409752
Ross Ranch Meadow	05	10	721638	4409505
Ross Ranch Meadow	06	10	721786	4409297
Ross Ranch Meadow	07	10	721882	4409062

Meadow Name	Station Number	UTM Zone	UTM Easting	UTM Northing
Ross Ranch Meadow	08	10	721953	4408820
Ross Ranch Meadow	09	10	722059	4408596
Ross Ranch Meadow	10	10	722118	4408355
Trossi Canyon	01	10	741468	4381454
Trossi Canyon	02	10	741223	4381478
Trossi Canyon	03	10	740978	4381473
Trossi Canyon	04	10	740729	4381489
Trossi Canyon	05	10	740483	4381533
Upper Bear Valley	01	10	738541	4383114
Upper Bear Valley	02	10	738379	4382919
Upper Bear Valley	03	10	738365	4382670
Upper Bear Valley	04	10	738346	4382420
Upper Bear Valley	05	10	738513	4382235
Upper Bear Valley	06	10	738733	4382151
Upper Bear Valley	07	10	738899	4381968
Upper Bear Valley	08	10	738141	4382905
Upper Bear Valley	09	10	737904	4382810
Upper Bear Valley	10	10	737670	4382712
West Carman Creek	01	10	716621	4398335
West Carman Creek	02	10	716451	4398488
West Carman Creek	03	10	716220	4398538
West Carman Creek	04	10	716010	4398661
West Carman Creek	05	10	716034	4398893
West Carman Creek	06	10	716174	4399088
West Carman Creek	07	10	716214	4400484
West Carman Creek	08	10	716227	4400737
West Carman Creek	09	10	716310	4400975

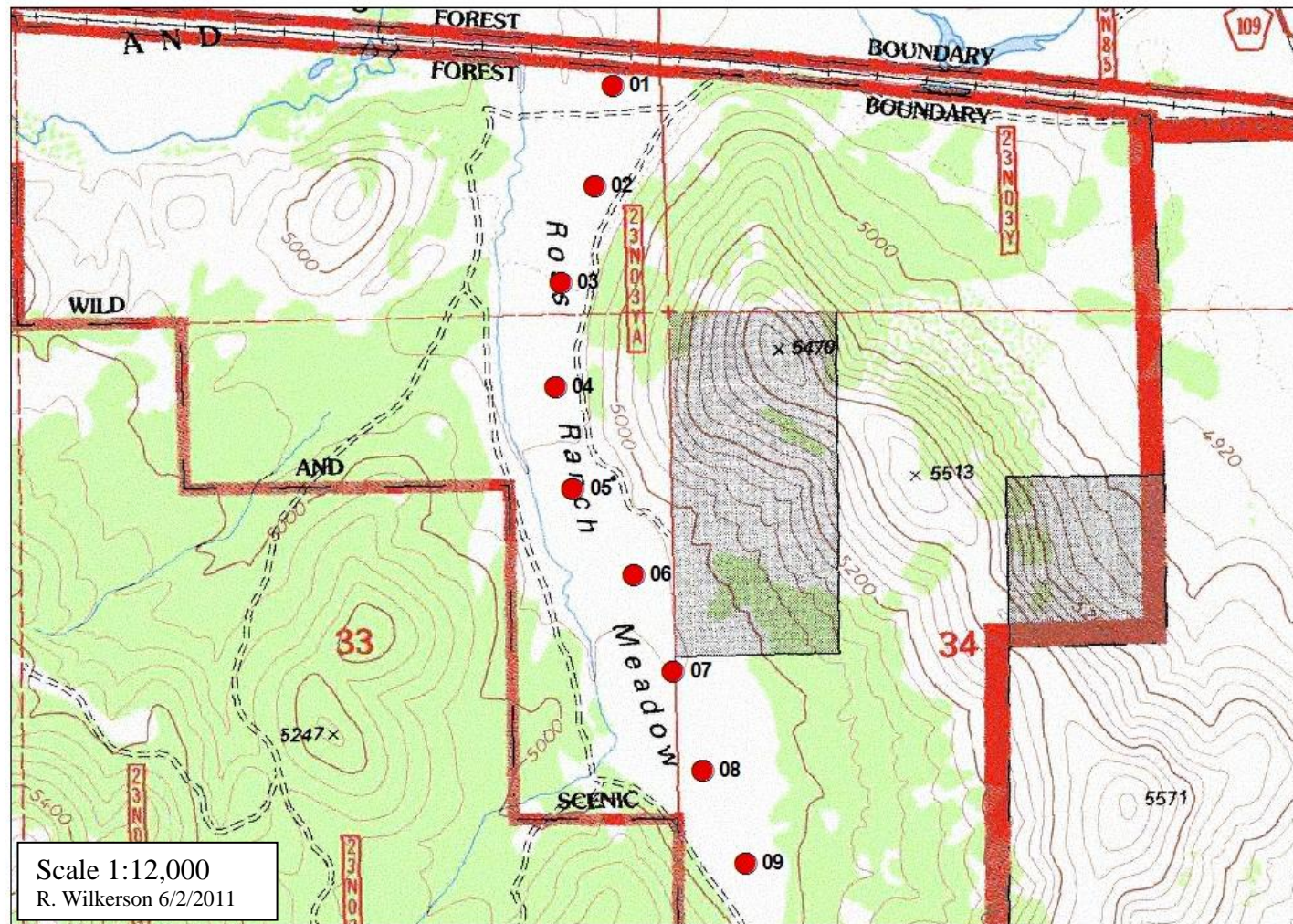
^aUTM coordinates projected in NAD 83.

Appendix B. Maps of meadows with survey station locations

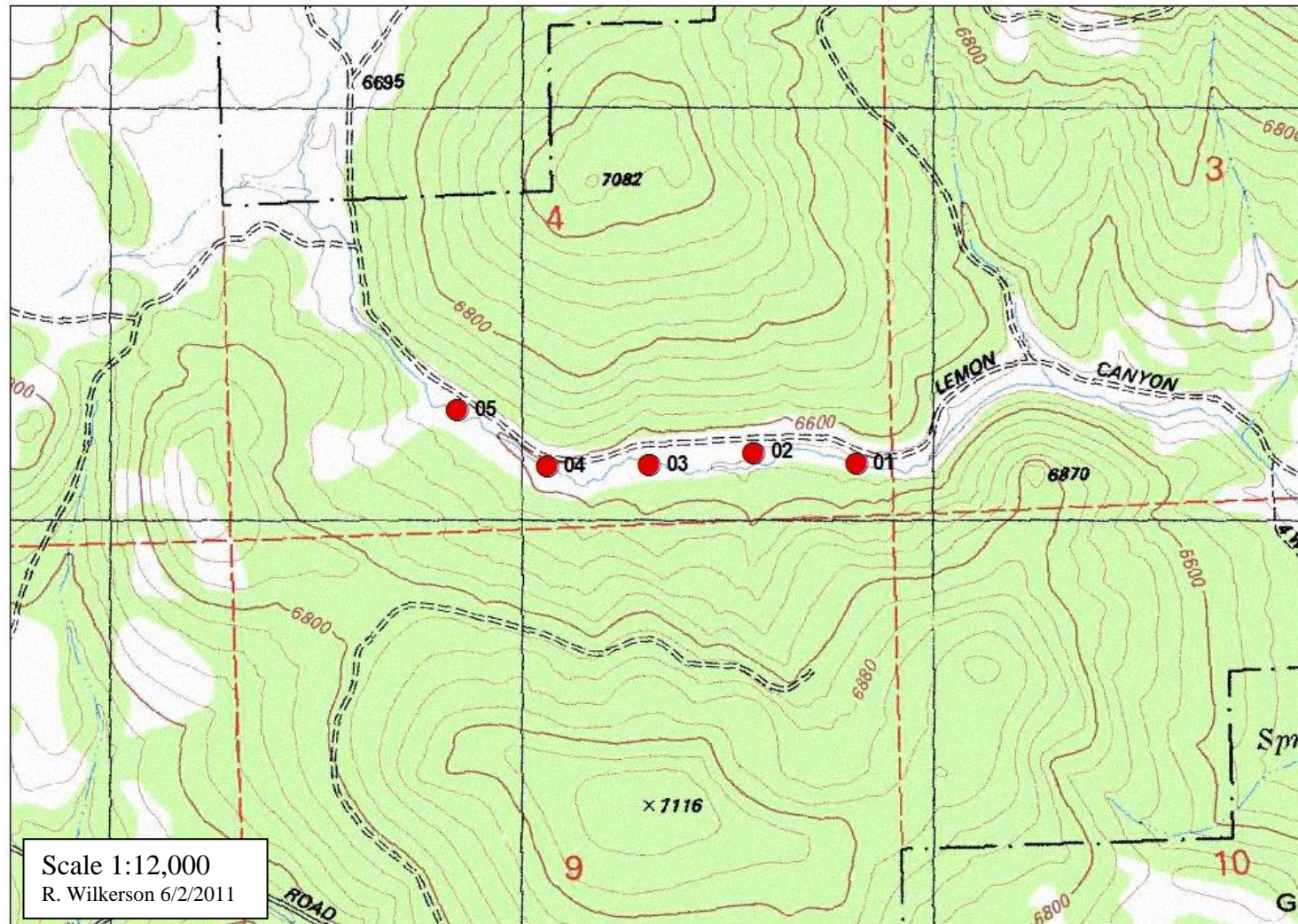
Map B-1. Carman Valley – Folchi



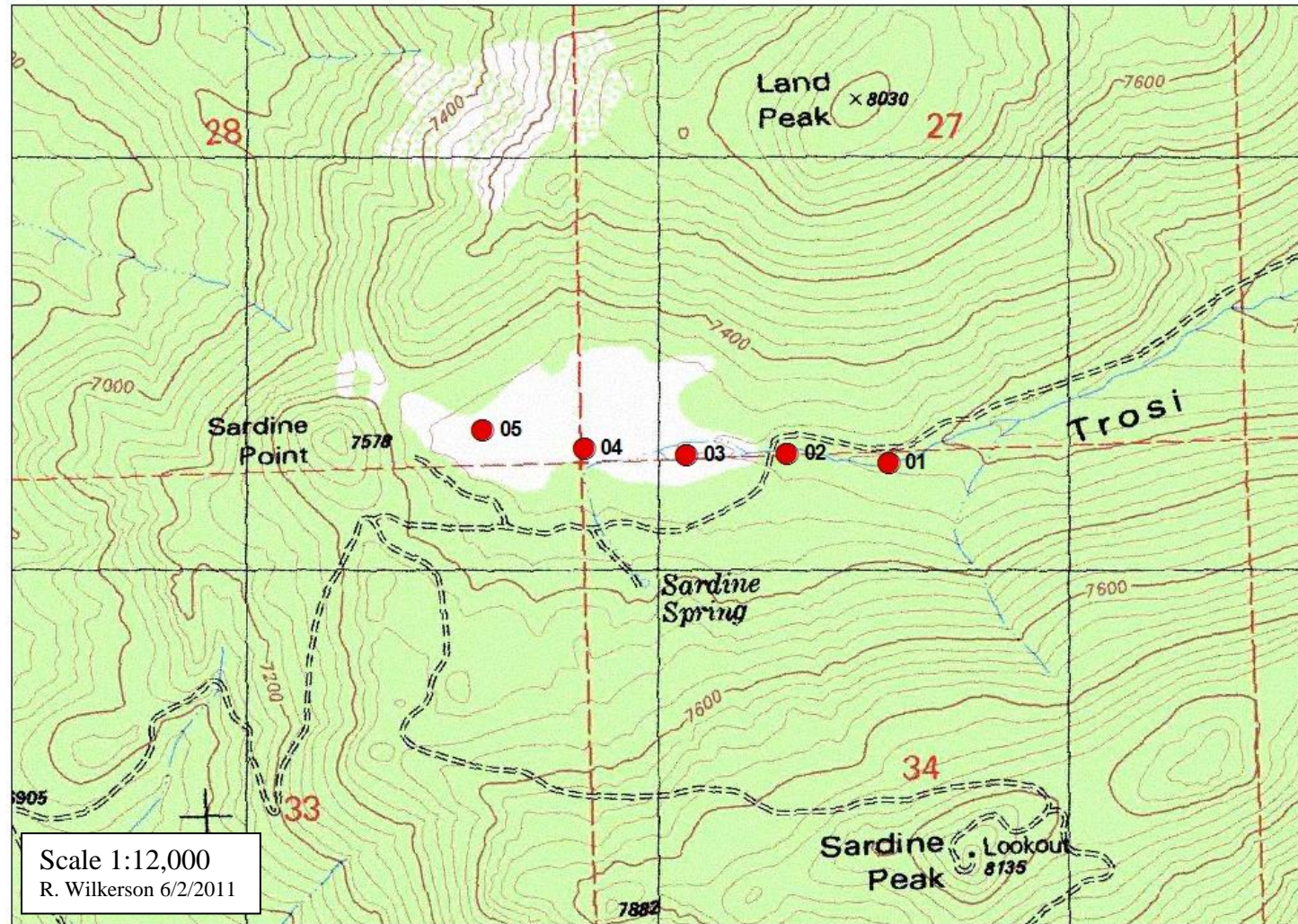
Map B-2. Ross Ranch Meadow



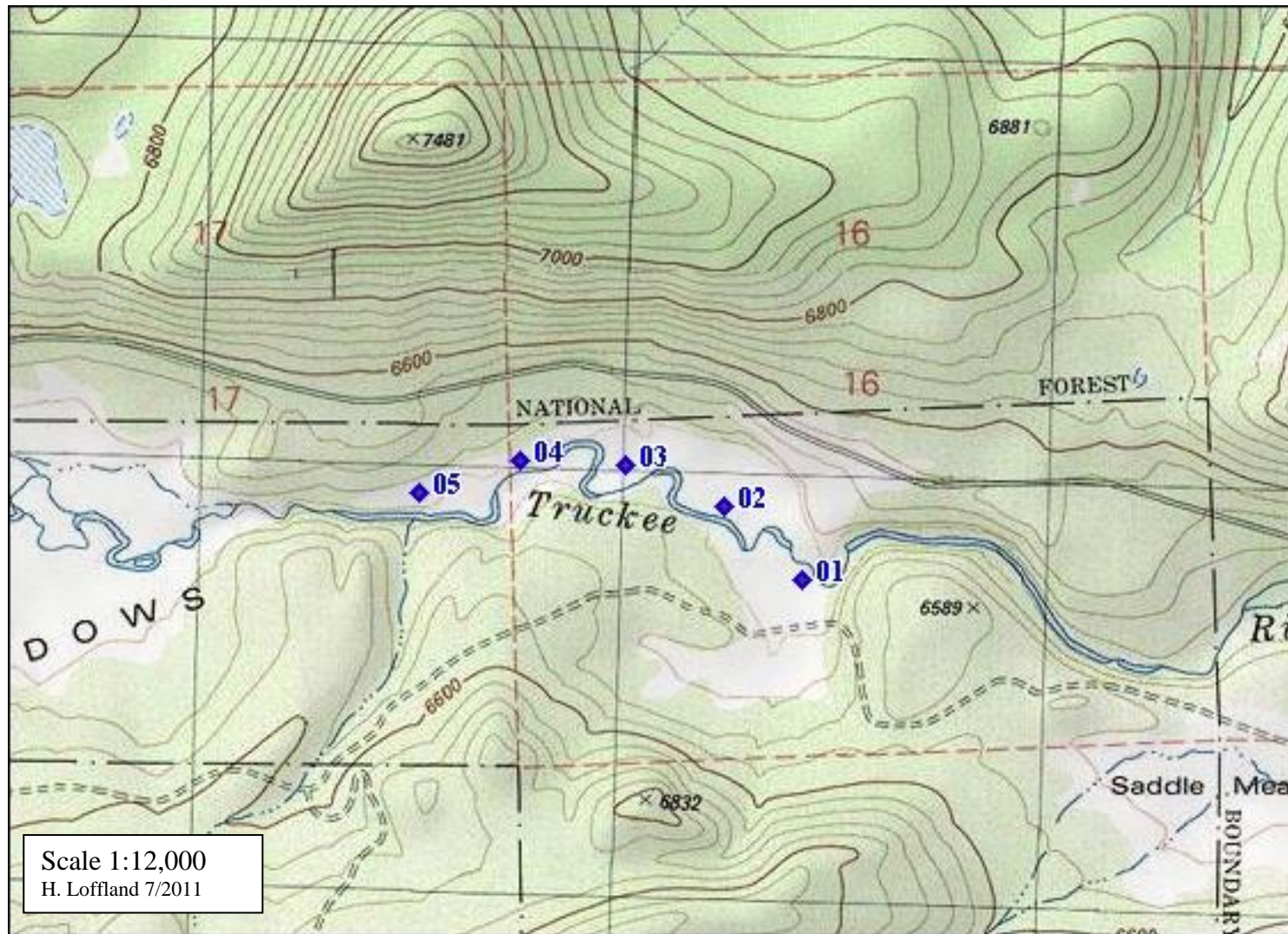
Map B-3. Davies Creek – Site 1



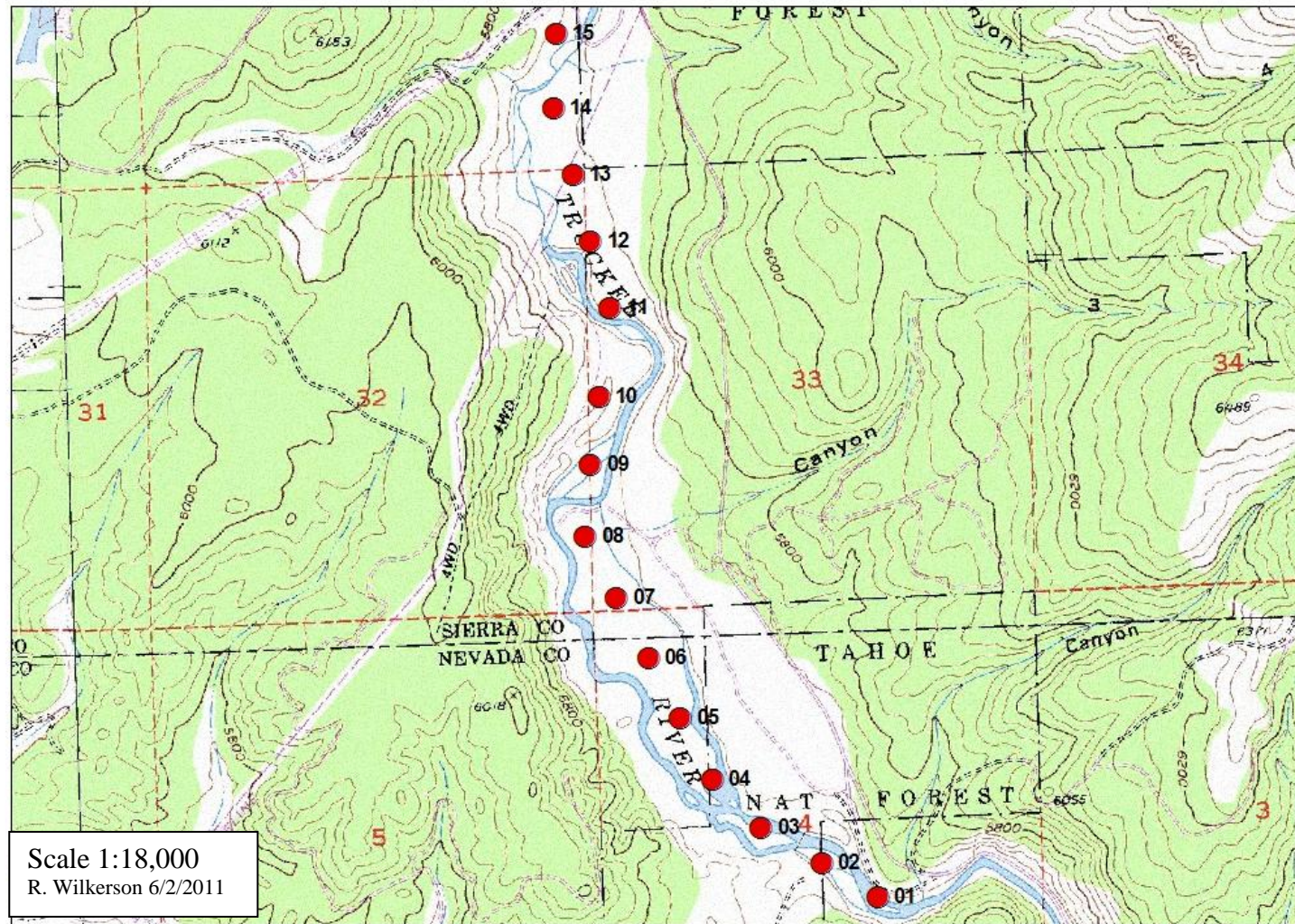
Map B-4. Trossi Canyon



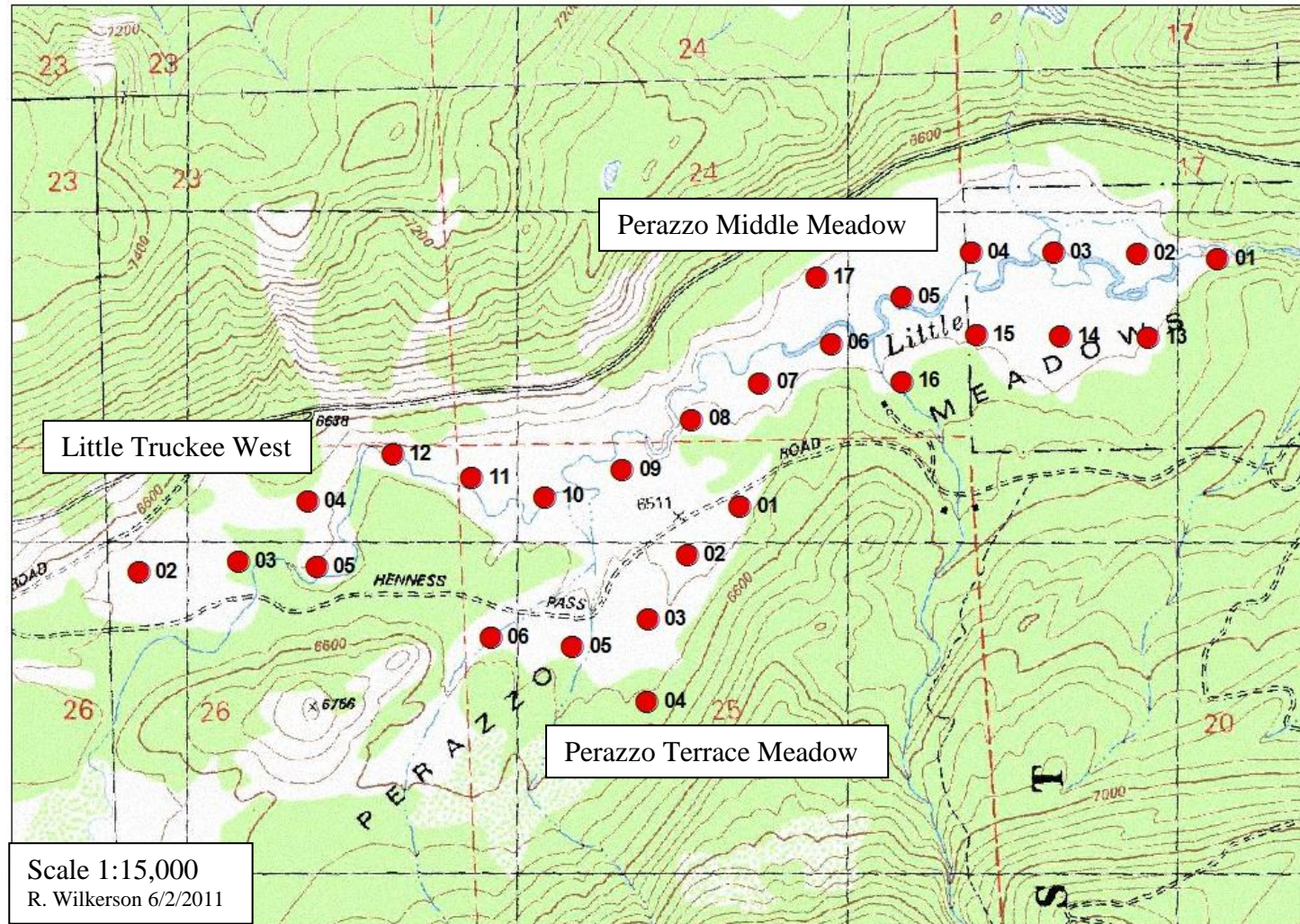
Map B-5. Perazzo Lower Meadow



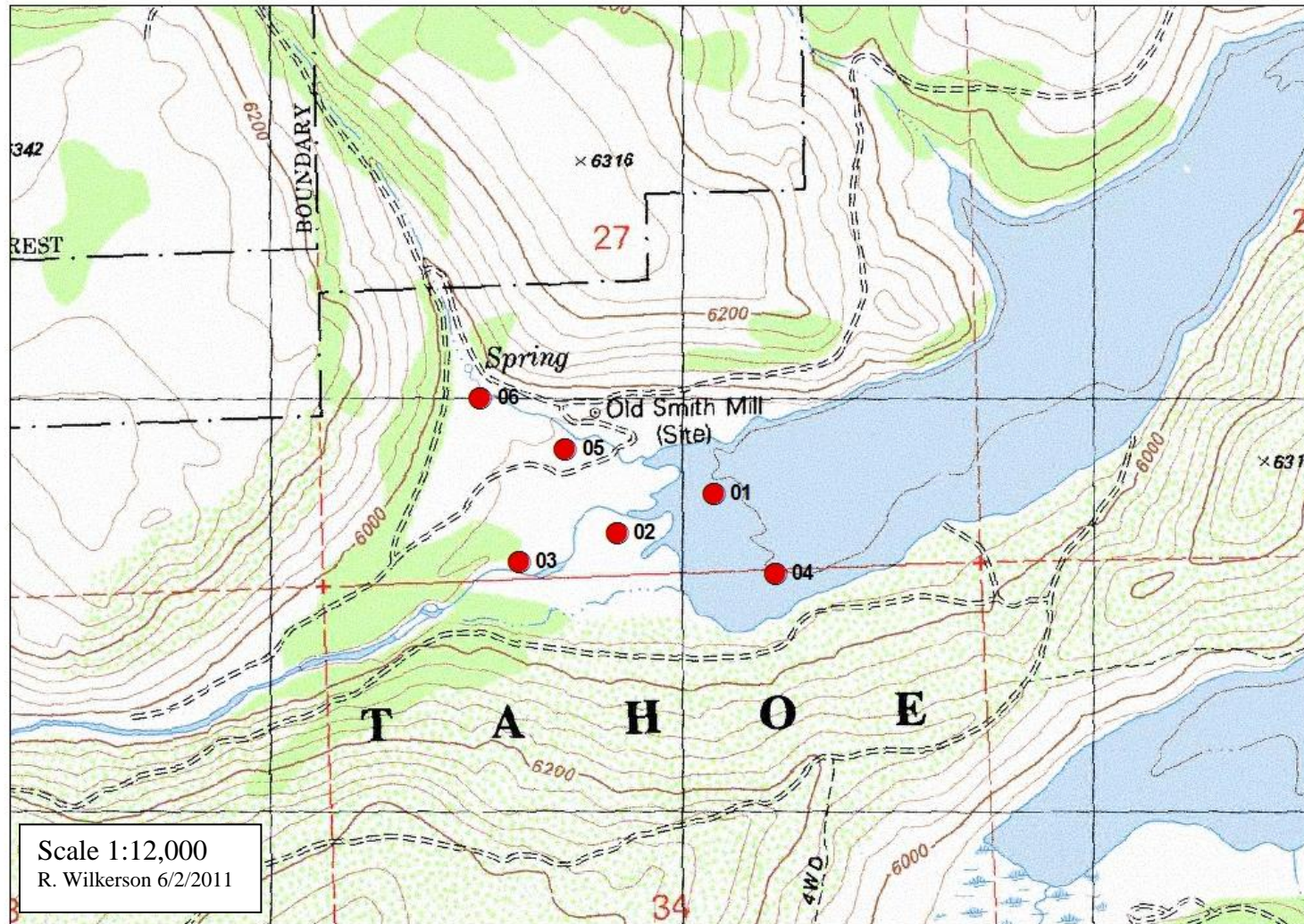
Map B-6. Little Truckee River below Stampede Reservoir



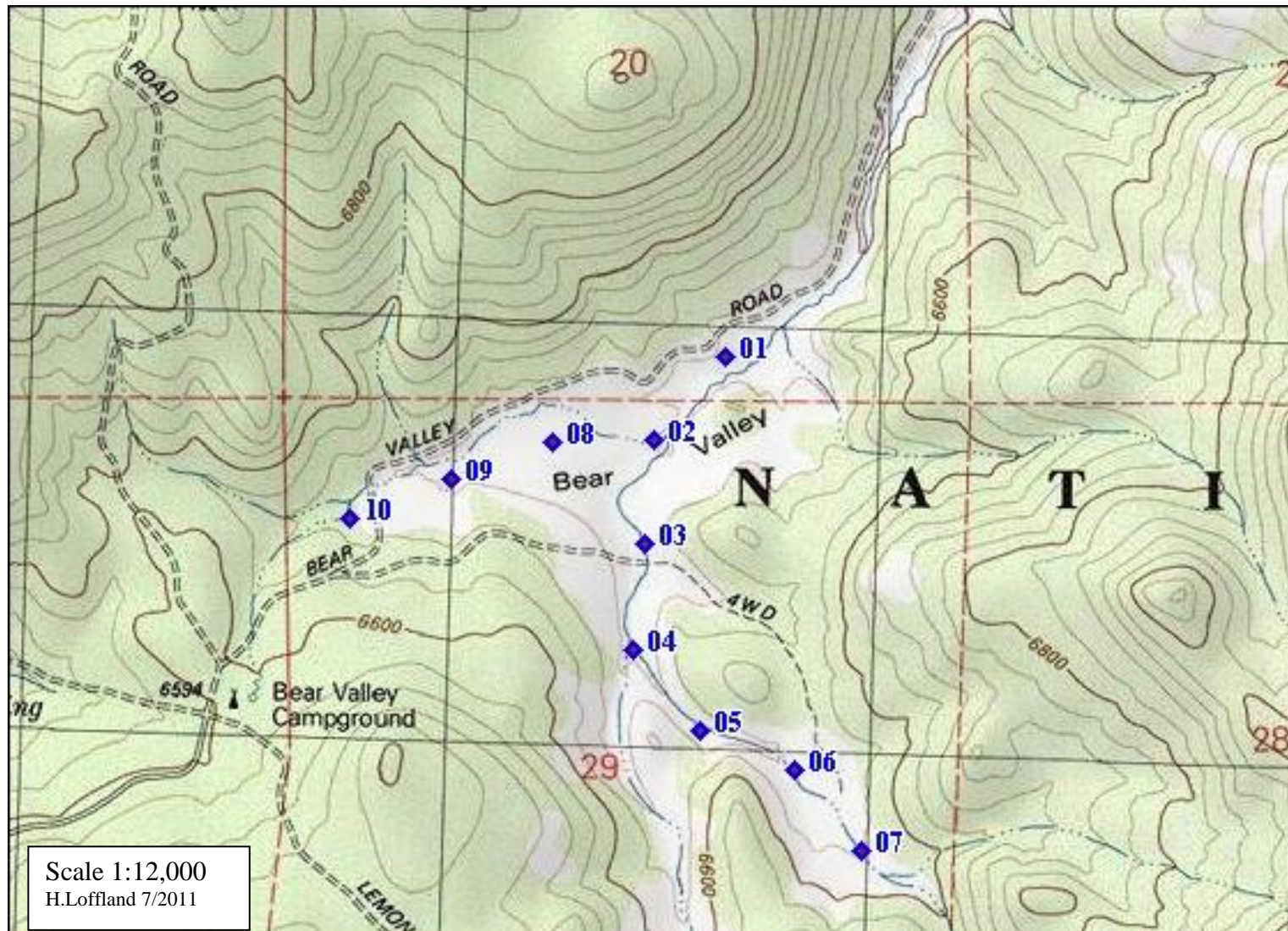
Map B-7. Perazzo Middle Meadow, Perazzo Terrace Meadow, and Little Truckee West



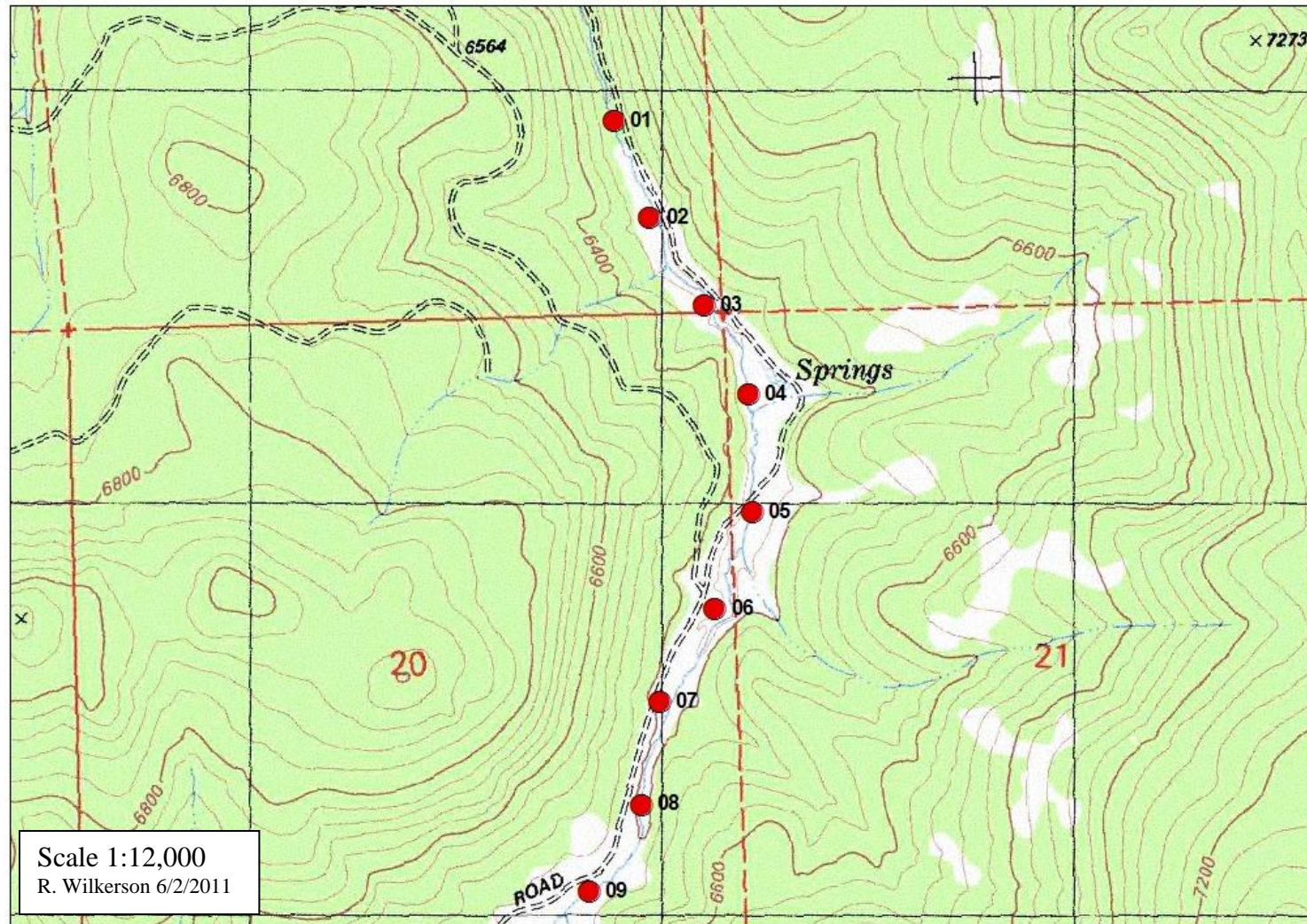
Map B-7. Little Truckee River above Stampede Reservoir



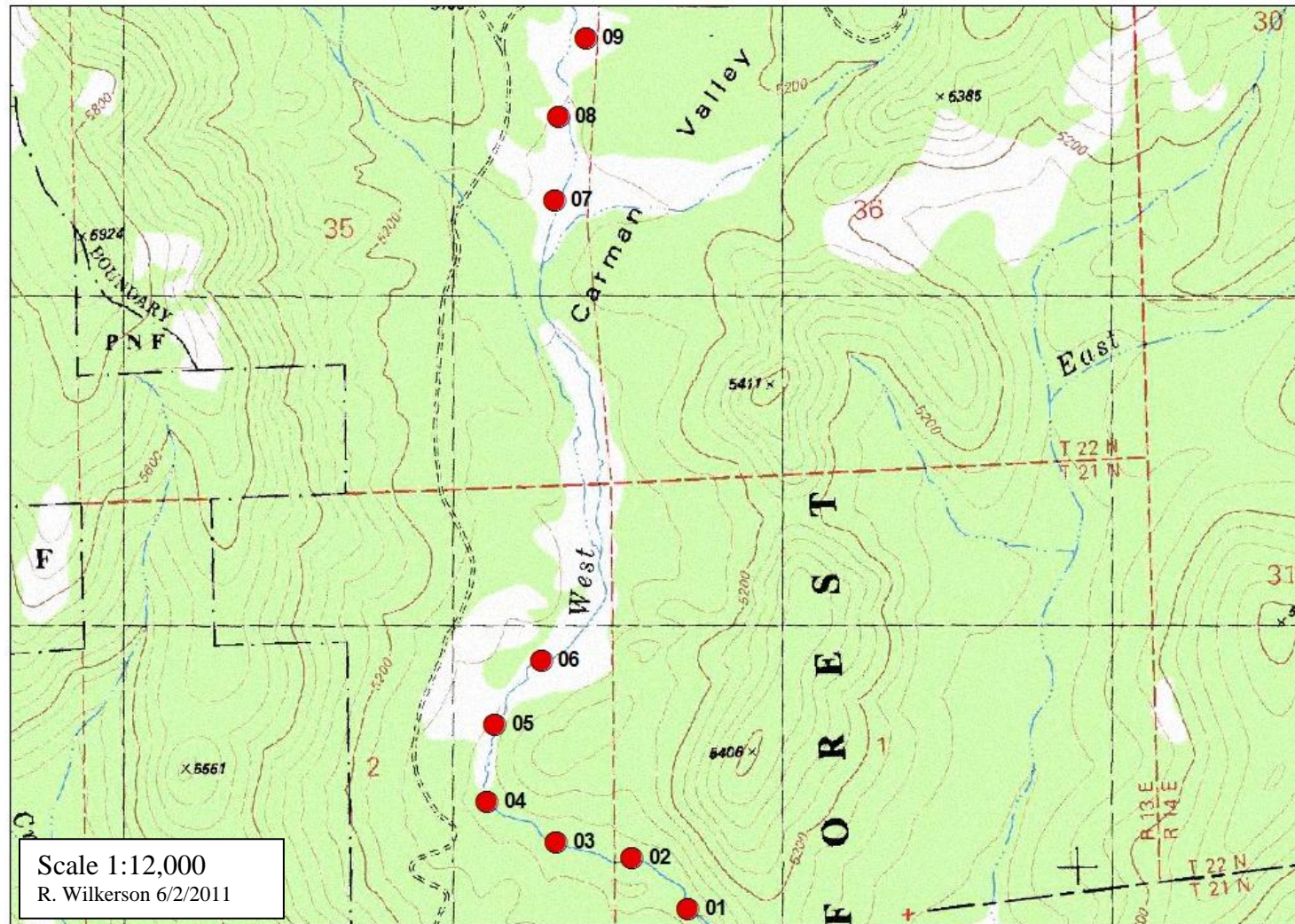
Map B-8. Upper Bear Valley



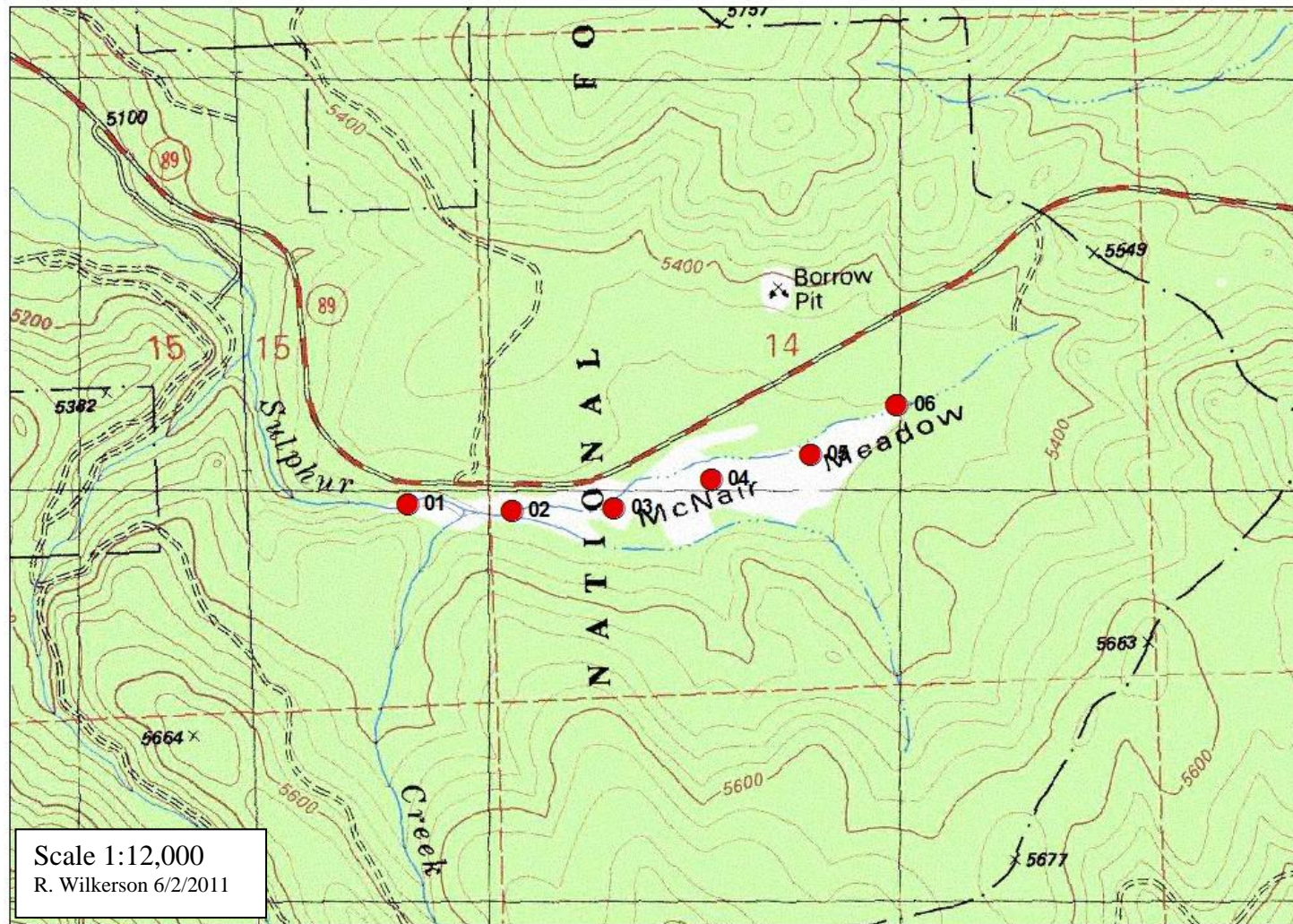
Map B-9. Lower Bear Valley



Map B-10. West Carman Creek



Map B-11. McNair Meadow



Appendix C. Number of birds detected during point counts at each meadow

Table C-1. Number of birds detected during point counts at Carman Valley - Folchi and Ross Ranch Meadow.

Species ^e	Carman Valley - Folchi (n = 16 survey station)				Ross Ranch Meadow (n = 10 survey stations)			
	Avg. No. of Birds Detected ^a		Avg. No. of Birds per Station ^b		Avg. No. of Birds Detected ^a		Avg. No. of Birds per Station ^b	
	<50m ^c	Unlimited Radius ^d	<50m ^c	Unlimited Radius ^d	<50m ^c	Unlimited Radius ^d	<50m ^c	Unlimited Radius ^d
Canada Goose	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.10
Mallard	0.00	2.50	0.00	0.16	0.00	0.00	0.00	0.00
Cinnamon Teal	0.00	1.00	0.00	0.06	0.00	0.00	0.00	0.00
Unidentified Duck	0.00	0.50	0.00	0.03	0.00	0.00	0.00	0.00
Mountain Quail	0.00	13.50	0.00	0.84	0.00	8.00	0.00	0.80
Pied-billed Grebe	0.00	3.00	0.00	0.19	0.00	0.00	0.00	0.00
Osprey	0.00	0.50	0.00	0.03	0.00	0.00	0.00	0.00
Northern Harrier	0.00	1.50	0.00	0.09	0.00	0.00	0.00	0.00
Red-tailed Hawk	0.00	1.00	0.00	0.06	0.00	1.00	0.00	0.10
Unidentified Hawk	0.50	0.50	0.03	0.03	0.00	0.00	0.00	0.00
American Kestrel	0.00	1.50	0.00	0.09	0.00	0.00	0.00	0.00
Sandhill Crane	0.00	6.00	0.00	0.38	0.00	3.00	0.00	0.30
Killdeer	1.50	3.50	0.09	0.22	0.00	0.00	0.00	0.00
Wilson's Snipe	0.00	4.50	0.00	0.28	0.00	0.00	0.00	0.00
California Gull	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.10
Mourning Dove	0.00	10.00	0.00	0.63	0.00	6.00	0.00	0.60
Northern Pygmy-Owl	0.00	0.50	0.00	0.03	0.00	0.00	0.00	0.00
Red-breasted Sapsucker	0.00	1.50	0.00	0.09	0.00	1.00	0.00	0.10
White-headed Woodpecker	0.00	1.00	0.00	0.06	0.00	0.00	0.00	0.00
Northern Flicker	0.00	12.00	0.00	0.75	0.00	0.00	0.00	0.00
Olive-sided Flycatcher	0.00	0.00	0.00	0.00	0.00	3.00	0.00	0.30
Western Wood-Pewee	0.00	19.00	0.00	1.19	1.00	21.00	0.10	2.10
Gray Flycatcher	0.00	0.50	0.00	0.03	0.00	1.00	0.00	0.10
Dusky Flycatcher	0.00	0.50	0.00	0.03	0.00	1.00	0.00	0.10
Unidentified <i>Empidonax</i> Flycatcher	0.00	1.00	0.00	0.06	0.00	0.00	0.00	0.00

Species ^e	Carman Valley - Folchi (n = 16 survey station)				Ross Ranch Meadow (n = 10 survey stations)			
	Avg. No. of Birds Detected ^a		Avg. No. of Birds per Station ^b		Avg. No. of Birds Detected ^a		Avg. No. of Birds per Station ^b	
	<50m ^c	Unlimited Radius ^d	<50m ^c	Unlimited Radius ^d	<50m ^c	Unlimited Radius ^d	<50m ^c	Unlimited Radius ^d
Steller's Jay	0.00	12.00	0.00	0.75	0.00	14.00	0.00	1.40
American Crow	0.00	1.00	0.00	0.06	0.00	0.00	0.00	0.00
Common Raven	0.00	5.00	0.00	0.31	0.00	0.00	0.00	0.00
Horned Lark	1.00	8.00	0.06	0.50	0.00	0.00	0.00	0.00
Mountain Chickadee	0.00	7.00	0.00	0.44	0.00	7.00	0.00	0.70
Red-breasted Nuthatch	0.00	6.00	0.00	0.38	0.00	7.00	0.00	0.70
White-breasted Nuthatch	0.00	2.00	0.00	0.13	0.00	3.00	0.00	0.30
Brown Creeper	0.00	2.00	0.00	0.13	0.00	1.00	0.00	0.10
House Wren	0.00	2.00	0.00	0.13	0.00	1.00	0.00	0.10
Western Bluebird	0.50	1.50	0.03	0.09	0.00	0.00	0.00	0.00
Mountain Bluebird	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.10
American Robin	2.50	17.50	0.16	1.09	0.00	12.00	0.00	1.20
European Starling	0.00	0.50	0.00	0.03	0.00	0.00	0.00	0.00
Yellow-rumped Warbler	0.00	1.00	0.00	0.06	0.00	4.00	0.00	0.40
Western Tanager	0.00	6.50	0.00	0.41	0.00	5.00	0.00	0.50
Green-tailed Towhee	0.00	0.00	0.00	0.00	0.00	7.00	0.00	0.70
Spotted Towhee	0.00	0.00	0.00	0.00	0.00	10.00	0.00	1.00
Chipping Sparrow	0.50	4.00	0.03	0.25	0.00	4.00	0.00	0.40
Brewer's Sparrow	0.50	7.50	0.03	0.47	0.00	0.00	0.00	0.00
Vesper Sparrow	1.50	15.00	0.09	0.94	1.00	7.00	0.10	0.70
Savannah Sparrow	0.50	2.00	0.03	0.13	0.00	4.00	0.00	0.40
Song Sparrow	0.00	0.50	0.00	0.03	0.00	0.00	0.00	0.00
Lincoln's Sparrow	1.00	5.00	0.06	0.31	0.00	1.00	0.00	0.10
Dark-eyed Junco	0.00	3.00	0.00	0.19	0.00	2.00	0.00	0.20
Black-headed Grosbeak	0.00	0.00	0.00	0.00	0.00	3.00	0.00	0.30
Red-winged Blackbird	2.00	7.50	0.13	0.47	0.00	4.00	0.00	0.40
Western Meadowlark	9.00	43.50	0.56	2.72	2.00	15.00	0.20	1.50
Brewer's Blackbird	7.50	20.00	0.47	1.25	1.00	12.00	0.10	1.20

<i>Species^e</i>	<i>Carman Valley - Folchi (n = 16 survey station)</i>				<i>Ross Ranch Meadow (n = 10 survey stations)</i>			
	<i>Avg. No. of Birds Detected^a</i>		<i>Avg. No. of Birds per Station^b</i>		<i>Avg. No. of Birds Detected^a</i>		<i>Avg. No. of Birds per Station^b</i>	
	<i><50m^c</i>	<i>Unlimited Radius^d</i>	<i><50m^c</i>	<i>Unlimited Radius^d</i>	<i><50m^c</i>	<i>Unlimited Radius^d</i>	<i><50m^c</i>	<i>Unlimited Radius^d</i>
Brown-headed Cowbird	0.00	4.50	0.00	0.28	1.00	8.00	0.10	0.80
Cassin's Finch	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.10
Evening Grosbeak	0.00	3.00	0.00	0.19	0.00	0.00	0.00	0.00

^aNumber of individuals detected at the meadow, averaged across 2 survey visits. ^bNumber of individual birds detected divided by the number of survey stations and visits. ^cOnly includes birds detected within 50m of a survey point. ^dAll birds detected regardless of distance from survey station. ^eMeadow focal species indicated in bold text.

Table C-2. Number of birds detected during point counts at Davies Creek – Site 1 and Trossi Canyon.

Species ^e	Davies Creek- Site 1 (n = 5 survey stations)				Trossi Canyon (n = 5 survey stations)			
	Avg. No. of Birds Detected ^a		Avg. No. of Birds per Station ^b		Avg. No. of Birds Detected ^a		Avg. No. of Birds per Station ^b	
	<50m ^c	Unlimited Radius ^d	<50m ^c	Unlimited Radius ^d	<50m ^c	Unlimited Radius ^d	<50m ^c	Unlimited Radius ^d
Mountain Quail	0.00	2.50	0.00	0.50	0.00	0.50	0.00	0.10
California Quail	1.00	1.00	0.20	0.20	0.00	0.50	0.00	0.10
Red-tailed Hawk	0.00	0.00	0.00	0.00	0.50	0.50	0.10	0.10
Wilson's Snipe	0.50	0.50	0.10	0.10	0.00	0.00	0.00	0.00
Common Nighthawk	0.00	0.50	0.00	0.10	0.00	0.00	0.00	0.00
Calliope Hummingbird	1.00	1.00	0.20	0.20	0.00	0.00	0.00	0.00
Rufous Hummingbird	1.50	2.00	0.30	0.40	0.50	0.50	0.10	0.10
Unidentified Hummingbird	0.50	0.50	0.10	0.10	0.00	0.00	0.00	0.00
Williamson's Sapsucker	0.00	0.00	0.00	0.00	0.50	0.50	0.10	0.10
Red-breasted Sapsucker	0.50	1.50	0.10	0.30	0.00	0.50	0.00	0.10
Hairy Woodpecker	0.00	1.00	0.00	0.20	0.00	0.00	0.00	0.00
White-headed Woodpecker	0.00	0.50	0.00	0.10	0.50	0.50	0.10	0.10
Northern Flicker	0.00	0.50	0.00	0.10	0.00	2.00	0.00	0.40
Olive-sided Flycatcher	0.00	0.00	0.00	0.00	0.00	1.50	0.00	0.30
Western Wood-Pewee	0.50	5.00	0.10	1.00	0.50	5.50	0.10	1.10
Hammond's Flycatcher	0.00	0.50	0.00	0.10	0.00	0.50	0.00	0.10
Cassin's Vireo	0.00	1.00	0.00	0.20	0.00	0.00	0.00	0.00
Hutton's Vireo	0.00	0.50	0.00	0.10	0.00	0.50	0.00	0.10
Warbling Vireo	1.50	3.00	0.30	0.60	0.50	3.50	0.10	0.70
Steller's Jay	1.00	2.50	0.20	0.50	0.00	1.00	0.00	0.20
Clark's Nutcracker	0.00	0.00	0.00	0.00	0.50	6.50	0.10	1.30
Common Raven	0.50	1.00	0.10	0.20	0.00	0.00	0.00	0.00
Mountain Chickadee	3.00	8.50	0.60	1.70	2.00	8.00	0.40	1.60
Red-breasted Nuthatch	0.00	3.00	0.00	0.60	0.00	3.00	0.00	0.60
Brown Creeper	0.00	0.50	0.00	0.10	0.50	1.00	0.10	0.20
House Wren	0.00	0.00	0.00	0.00	1.00	5.50	0.20	1.10
Ruby-crowned Kinglet	0.00	0.50	0.00	0.10	0.00	0.00	0.00	0.00
Townsend's Solitaire	0.00	1.50	0.00	0.30	0.00	0.00	0.00	0.00
Hermit Thrush	0.00	0.50	0.00	0.10	0.00	0.00	0.00	0.00

Species ^e	Davies Creek- Site 1 (n = 5 survey stations)				Trossi Canyon (n = 5 survey stations)			
	Avg. No. of Birds Detected ^a		Avg. No. of Birds per Station ^b		Avg. No. of Birds Detected ^a		Avg. No. of Birds per Station ^b	
	<50m ^c	Unlimited Radius ^d	<50m ^c	Unlimited Radius ^d	<50m ^c	Unlimited Radius ^d	<50m ^c	Unlimited Radius ^d
American Robin	1.00	5.50	0.20	1.10	2.50	6.00	0.50	1.20
Nashville Warbler	0.00	0.50	0.00	0.10	0.00	0.00	0.00	0.00
Yellow Warbler	2.50	3.50	0.50	0.70	0.00	0.00	0.00	0.00
MacGillivray's Warbler	1.00	2.00	0.20	0.40	0.00	0.00	0.00	0.00
Western Tanager	0.50	3.50	0.10	0.70	0.50	0.50	0.10	0.10
Green-tailed Towhee	4.50	9.50	0.90	1.90	1.50	5.00	0.30	1.00
Chipping Sparrow	0.50	0.50	0.10	0.10	1.00	1.00	0.20	0.20
Brewer's Sparrow	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.10
Fox Sparrow	0.50	1.50	0.10	0.30	0.00	0.50	0.00	0.10
Song Sparrow	2.00	2.50	0.40	0.50	0.00	0.50	0.00	0.10
Lincoln's Sparrow	0.00	0.00	0.00	0.00	0.50	0.50	0.10	0.10
White-crowned Sparrow	3.50	7.00	0.70	1.40	0.50	2.50	0.10	0.50
Dark-eyed Junco	4.00	9.50	0.80	1.90	6.50	11.00	1.30	2.20
Black-headed Grosbeak	0.00	0.50	0.00	0.10	0.00	0.00	0.00	0.00
Brewer's Blackbird	1.50	1.50	0.30	0.30	0.00	0.00	0.00	0.00
Brown-headed Cowbird	0.50	0.50	0.10	0.10	0.00	0.00	0.00	0.00
Cassin's Finch	1.00	3.50	0.20	0.70	0.00	2.00	0.00	0.40

^aNumber of individuals detected at the meadow, averaged across 2 survey visits. ^bNumber of individual birds detected divided by the number of survey stations and visits. ^cOnly includes birds detected within 50m of a survey point. ^dAll birds detected regardless of distance from survey station. ^eMeadow focal species indicated in bold text.

Table C-3. Number of birds detected during point counts at Perazzo Middle Meadow and Little Truckee River above Stampede Reservoir.

Species ^e	Perazzo Middle Meadow (n = 16 survey stations)				Little Truckee River above Stampede Res. (n = 4 survey stations)			
	Avg. No. of Birds Detected ^a		Avg. No. of Birds per Station ^b		Avg. No. of Birds Detected ^a		Avg. No. of Birds per Station ^b	
	<50m ^c	Unlimited Radius ^d	<50m ^c	Unlimited Radius ^d	<50m ^c	Unlimited Radius ^d	<50m ^c	Unlimited Radius ^d
Canada Goose	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.13
Mallard	1.00	4.00	0.06	0.25	0.00	0.00	0.00	0.00
Cinnamon Teal	0.00	0.50	0.00	0.03	0.00	0.00	0.00	0.00
Green-winged Teal	0.00	0.50	0.00	0.03	0.00	0.00	0.00	0.00
Common Merganser	0.50	0.50	0.03	0.03	0.00	1.00	0.00	0.25
Mountain Quail	0.00	2.00	0.00	0.13	0.00	2.00	0.00	0.50
California Quail	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.50
Red-tailed Hawk	0.00	0.50	0.00	0.03	0.00	0.00	0.00	0.00
Virginia Rail	0.50	1.50	0.03	0.09	0.00	0.00	0.00	0.00
Killdeer	0.00	1.00	0.00	0.06	0.50	1.50	0.13	0.38
Spotted Sandpiper	4.00	14.50	0.25	0.91	0.50	3.50	0.13	0.88
Wilson's Snipe	0.50	13.50	0.03	0.84	0.00	0.00	0.00	0.00
Mourning Dove	0.00	0.00	0.00	0.00	0.50	1.00	0.13	0.25
Calliope Hummingbird	2.50	2.50	0.16	0.16	0.50	0.50	0.13	0.13
Rufous Hummingbird	0.50	0.50	0.03	0.03	0.00	0.00	0.00	0.00
Williamson's Sapsucker	0.50	0.50	0.03	0.03	0.00	0.00	0.00	0.00
Red-breasted Sapsucker	2.00	2.00	0.13	0.13	1.50	1.50	0.38	0.38
Hairy Woodpecker	0.50	0.50	0.03	0.03	0.00	0.00	0.00	0.00
Northern Flicker	0.00	6.50	0.00	0.41	0.00	2.00	0.00	0.50
Pileated Woodpecker	0.00	0.50	0.00	0.03	0.00	0.00	0.00	0.00
Olive-sided Flycatcher	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.25
Western Wood-Pewee	0.50	18.00	0.03	1.13	0.50	5.50	0.13	1.38
Willow Flycatcher	0.50	3.50	0.03	0.22	0.00	1.00	0.00	0.25
Dusky Flycatcher	2.00	8.50	0.13	0.53	0.00	0.00	0.00	0.00
Warbling Vireo	1.00	8.50	0.06	0.53	1.00	1.50	0.25	0.38
Steller's Jay	0.50	8.00	0.03	0.50	0.00	1.00	0.00	0.25
Common Raven	0.50	3.50	0.03	0.22	0.00	0.50	0.00	0.13
Tree Swallow	2.50	3.00	0.16	0.19	3.50	4.50	0.88	1.13

<i>Species^e</i>	<i>Perazzo Middle Meadow (n = 16 survey stations)</i>				<i>Little Truckee River above Stampede Res. (n = 4 survey stations)</i>			
	<i>Avg. No. of Birds Detected^a</i>		<i>Avg. No. of Birds per Station^b</i>		<i>Avg. No. of Birds Detected^a</i>		<i>Avg. No. of Birds per Station^b</i>	
	<i><50m^c</i>	<i>Unlimited Radius^d</i>	<i><50m^c</i>	<i>Unlimited Radius^d</i>	<i><50m^c</i>	<i>Unlimited Radius^d</i>	<i><50m^c</i>	<i>Unlimited Radius^d</i>
Northern Rough-winged Swallow	0.50	0.50	0.03	0.03	0.00	0.00	0.00	0.00
Mountain Chickadee	0.00	10.00	0.00	0.63	0.50	3.00	0.13	0.75
Red-breasted Nuthatch	0.00	3.00	0.00	0.19	0.00	0.00	0.00	0.00
White-breasted Nuthatch	0.00	0.50	0.00	0.03	0.00	0.00	0.00	0.00
Pygmy Nuthatch	0.00	0.00	0.00	0.00	0.50	0.50	0.13	0.13
Brown Creeper	0.00	1.00	0.00	0.06	0.00	0.00	0.00	0.00
Western Bluebird	0.00	0.50	0.00	0.03	0.00	0.00	0.00	0.00
Townsend's Solitaire	0.00	0.50	0.00	0.03	0.00	0.00	0.00	0.00
Hermit Thrush	0.00	0.50	0.00	0.03	0.00	0.00	0.00	0.00
American Robin	4.50	13.50	0.28	0.84	2.50	5.50	0.63	1.38
European Starling	0.00	0.50	0.00	0.03	0.00	0.00	0.00	0.00
Nashville Warbler	0.00	0.50	0.00	0.03	0.00	0.00	0.00	0.00
Yellow Warbler	9.50	28.00	0.59	1.75	4.00	11.00	1.00	2.75
Yellow-rumped Warbler	0.00	4.00	0.00	0.25	0.00	0.00	0.00	0.00
MacGillivray's Warbler	1.50	2.50	0.09	0.16	0.00	0.00	0.00	0.00
Wilson's Warbler	1.00	7.50	0.06	0.47	0.00	0.50	0.00	0.13
Western Tanager	0.50	0.50	0.03	0.03	0.00	0.00	0.00	0.00
Green-tailed Towhee	0.50	1.00	0.03	0.06	0.00	0.00	0.00	0.00
Spotted Towhee	0.00	0.50	0.00	0.03	0.00	0.00	0.00	0.00
Brewer's Sparrow	0.00	0.00	0.00	0.00	1.50	3.00	0.38	0.75
Vesper Sparrow	0.50	1.00	0.03	0.06	0.00	0.00	0.00	0.00
Savannah Sparrow	0.50	3.00	0.03	0.19	0.50	0.50	0.13	0.13
Fox Sparrow	0.00	0.00	0.00	0.00	2.50	5.50	0.63	1.38
Song Sparrow	4.50	21.50	0.28	1.34	5.50	11.00	1.38	2.75
Lincoln's Sparrow	2.50	9.00	0.16	0.56	0.00	0.00	0.00	0.00
White-crowned Sparrow	6.00	26.50	0.38	1.66	0.50	3.50	0.13	0.88
Dark-eyed Junco	2.00	8.50	0.13	0.53	0.00	1.00	0.00	0.25
Red-winged Blackbird	8.00	30.50	0.50	1.91	0.00	0.00	0.00	0.00
Brewer's Blackbird	2.00	5.00	0.13	0.31	0.50	3.00	0.13	0.75

<i>Species^e</i>	<i>Perazzo Middle Meadow (n = 16 survey stations)</i>				<i>Little Truckee River above Stampede Res. (n = 4 survey stations)</i>			
	<i>Avg. No. of Birds Detected^a</i>		<i>Avg. No. of Birds per Station^b</i>		<i>Avg. No. of Birds Detected^a</i>		<i>Avg. No. of Birds per Station^b</i>	
	<i><50m^c</i>	<i>Unlimited Radius^d</i>	<i><50m^c</i>	<i>Unlimited Radius^d</i>	<i><50m^c</i>	<i>Unlimited Radius^d</i>	<i><50m^c</i>	<i>Unlimited Radius^d</i>
Brown-headed Cowbird	1.00	6.00	0.06	0.38	0.50	3.00	0.13	0.75
Cassin's Finch	0.00	0.50	0.00	0.03	0.00	0.00	0.00	0.00
Pine Siskin	0.00	0.50	0.00	0.03	0.00	0.00	0.00	0.00
Evening Grosbeak	0.00	2.50	0.00	0.16	0.00	0.00	0.00	0.00
Unidentified Bird	1.00	1.00	0.06	0.06	0.00	0.00	0.00	0.00

^aNumber of individuals detected at the meadow, averaged across 2 survey visits. ^bNumber of individual birds detected divided by the number of survey stations and visits. ^cOnly includes birds detected within 50m of a survey point. ^dAll birds detected regardless of distance from survey station. ^eMeadow focal species indicated in bold text.

Table C-4. Number of birds detected during point counts at Little Truckee River below Stampede Reservoir.

<i>Species^e</i>	<i>Little Truckee River Below Stampede Res. (n = 14 survey stations)</i>			
	<i>Avg. No. of Birds Detected^a</i>		<i>Avg. No. of Birds per Station^b</i>	
	<i><50m^c</i>	<i>Unlimited Radius^d</i>	<i><50m^c</i>	<i>Unlimited Radius^d</i>
Mallard	0.00	3.00	0.00	0.21
Common Merganser	1.00	2.50	0.07	0.18
Mountain Quail	0.50	4.00	0.04	0.29
California Quail	1.50	13.00	0.11	0.93
Turkey Vulture	0.00	3.50	0.00	0.25
Osprey	0.00	0.50	0.00	0.04
Red-tailed Hawk	0.00	0.50	0.00	0.04
American Kestrel	0.00	0.50	0.00	0.04
Spotted Sandpiper	4.00	7.00	0.29	0.50
California Gull	0.00	1.00	0.00	0.07
Mourning Dove	0.00	1.00	0.00	0.07
Belted Kingfisher	0.00	1.00	0.00	0.07
Red-breasted Sapsucker	0.50	0.50	0.04	0.04
Northern Flicker	0.00	8.00	0.00	0.57
Olive-sided Flycatcher	0.50	4.00	0.04	0.29
Western Wood-Pewee	1.00	16.00	0.07	1.14
Warbling Vireo	0.00	2.50	0.00	0.18
Steller's Jay	1.00	8.50	0.07	0.61
Clark's Nutcracker	0.00	1.00	0.00	0.07
Common Raven	0.00	1.50	0.00	0.11
Horned Lark	0.00	0.50	0.00	0.04
Northern Rough-winged Swallow	7.50	7.50	0.54	0.54
Cliff Swallow	0.50	1.00	0.04	0.07
Mountain Chickadee	1.50	12.50	0.11	0.89
Red-breasted Nuthatch	0.00	2.00	0.00	0.14
Brown Creeper	0.50	0.50	0.04	0.04
House Wren	0.50	1.00	0.04	0.07
Townsend's Solitaire	0.00	1.00	0.00	0.07

<i>Species^e</i>	<i>Little Truckee River Below Stampede Res. (n = 14 survey stations)</i>			
	<i>Avg. No. of Birds Detected^a</i>		<i>Avg. No. of Birds per Station^b</i>	
	<i><50m^c</i>	<i>Unlimited Radius^d</i>	<i><50m^c</i>	<i>Unlimited Radius^d</i>
American Robin	6.00	17.50	0.43	1.25
European Starling	0.50	1.50	0.04	0.11
Orange-crowned Warbler	1.00	1.00	0.07	0.07
Nashville Warbler	1.00	1.50	0.07	0.11
Yellow Warbler	8.50	20.50	0.61	1.46
Yellow-rumped Warbler	0.00	2.00	0.00	0.14
MacGillivray's Warbler	1.50	3.50	0.11	0.25
Wilson's Warbler	0.00	1.50	0.00	0.11
Green-tailed Towhee	3.00	9.00	0.21	0.64
Chipping Sparrow	0.00	1.00	0.00	0.07
Brewer's Sparrow	0.00	4.50	0.00	0.32
Vesper Sparrow	0.00	4.00	0.00	0.29
Savannah Sparrow	0.50	0.50	0.04	0.04
Fox Sparrow	1.50	3.00	0.11	0.21
Song Sparrow	7.00	23.50	0.50	1.68
Lincoln's Sparrow	0.00	1.50	0.00	0.11
White-crowned Sparrow	3.50	7.00	0.25	0.50
Dark-eyed Junco	1.00	4.00	0.07	0.29
Red-winged Blackbird	1.00	8.00	0.07	0.57
Brewer's Blackbird	4.50	9.00	0.32	0.64
Brown-headed Cowbird	4.50	10.00	0.32	0.71

^aNumber of individuals detected at the meadow, averaged across 2 survey visits. ^bNumber of individual birds detected divided by the number of survey stations and visits. ^cOnly includes birds detected within 50m of a survey point. ^dAll birds detected regardless of distance from survey station. ^eMeadow focal species indicated in bold text.

Table C-5. Number of birds detected during point counts at Perazzo Terrace Meadow and Little Truckee West.

Species ^e	Perazzo Terrace Meadow (n = 6 survey stations)				Little Truckee West (n = 5 survey stations)			
	Avg. No. of Birds Detected ^a		Avg. No. of Birds per Station ^b		Avg. No. of Birds Detected ^a		Avg. No. of Birds per Station ^b	
	<50m ^c	Unlimited Radius ^d	<50m ^c	Unlimited Radius ^d	<50m ^c	Unlimited Radius ^d	<50m ^c	Unlimited Radius ^d
Mallard	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.10
Common Merganser	0.00	0.50	0.00	0.08	0.00	0.00	0.00	0.00
Mountain Quail	0.00	3.00	0.00	0.50	0.00	0.50	0.00	0.10
Spotted Sandpiper	0.00	0.00	0.00	0.00	0.50	1.00	0.10	0.20
Wilson's Snipe	0.00	3.50	0.00	0.58	0.00	0.00	0.00	0.00
Calliope Hummingbird	0.50	0.50	0.08	0.08	0.00	0.00	0.00	0.00
Williamson's Sapsucker	0.00	0.50	0.00	0.08	0.00	0.00	0.00	0.00
Red-breasted Sapsucker	0.00	2.00	0.00	0.33	0.50	0.50	0.10	0.10
Hairy Woodpecker	0.00	0.00	0.00	0.00	0.50	0.50	0.10	0.10
Northern Flicker	0.00	3.50	0.00	0.58	0.00	1.50	0.00	0.30
Pileated Woodpecker	0.00	0.50	0.00	0.08	0.00	0.00	0.00	0.00
Western Wood-Pewee	1.00	8.50	0.17	1.42	0.50	5.00	0.10	1.00
Hammond's Flycatcher	0.00	0.00	0.00	0.00	0.50	1.00	0.10	0.20
Dusky Flycatcher	0.00	4.50	0.00	0.75	0.50	1.50	0.10	0.30
Pacific-slope Flycatcher	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.10
Warbling Vireo	0.00	8.00	0.00	1.33	1.00	4.50	0.20	0.90
Steller's Jay	0.00	0.50	0.00	0.08	0.00	1.00	0.00	0.20
Common Raven	0.00	0.50	0.00	0.08	0.00	0.50	0.00	0.10
Mountain Chickadee	0.00	5.50	0.00	0.92	0.00	4.50	0.00	0.90
Red-breasted Nuthatch	0.00	2.00	0.00	0.33	0.00	0.50	0.00	0.10
Brown Creeper	0.00	1.50	0.00	0.25	0.00	1.00	0.00	0.20
House Wren	0.00	2.00	0.00	0.33	0.00	0.00	0.00	0.00
Golden-crowned Kinglet	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.10
Townsend's Solitaire	0.00	0.50	0.00	0.08	0.00	0.00	0.00	0.00
Swainson's Thrush	0.00	0.50	0.00	0.08	0.00	0.00	0.00	0.00
American Robin	0.50	11.50	0.08	1.92	1.50	5.00	0.30	1.00
Nashville Warbler	0.00	0.00	0.00	0.00	0.50	0.50	0.10	0.10
Yellow Warbler	0.00	2.00	0.00	0.33	0.50	3.50	0.10	0.70
Yellow-rumped Warbler	0.50	1.00	0.08	0.17	0.00	2.50	0.00	0.50

Species ^e	Perazzo Terrace Meadow (n = 6 survey stations)				Little Truckee West (n = 5 survey stations)			
	Avg. No. of Birds Detected ^a		Avg. No. of Birds per Station ^b		Avg. No. of Birds Detected ^a		Avg. No. of Birds per Station ^b	
	<50m ^c	Unlimited Radius ^d	<50m ^c	Unlimited Radius ^d	<50m ^c	Unlimited Radius ^d	<50m ^c	Unlimited Radius ^d
Hermit Warbler	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.10
MacGillivray's Warbler	1.00	3.00	0.17	0.50	0.00	0.00	0.00	0.00
Wilson's Warbler	0.00	2.50	0.00	0.42	0.00	0.50	0.00	0.10
Western Tanager	0.00	0.50	0.00	0.08	0.00	0.00	0.00	0.00
Green-tailed Towhee	0.00	3.00	0.00	0.50	0.00	0.50	0.00	0.10
Spotted Towhee	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.10
Chipping Sparrow	0.00	1.00	0.00	0.17	0.00	1.50	0.00	0.30
Brewer's Sparrow	0.00	1.50	0.00	0.25	0.00	1.50	0.00	0.30
Savannah Sparrow	0.50	3.50	0.08	0.58	1.00	1.50	0.20	0.30
Fox Sparrow	0.00	0.00	0.00	0.00	0.50	1.00	0.10	0.20
Song Sparrow	0.00	1.00	0.00	0.17	1.00	2.50	0.20	0.50
Lincoln's Sparrow	0.00	7.00	0.00	1.17	1.50	2.00	0.30	0.40
White-crowned Sparrow	2.00	19.00	0.33	3.17	1.00	5.50	0.20	1.10
Dark-eyed Junco	1.50	7.00	0.25	1.17	1.50	4.00	0.30	0.80
Unidentified Sparrow	0.00	0.50	0.00	0.08	0.00	0.00	0.00	0.00
Red-winged Blackbird	0.00	3.50	0.00	0.58	0.00	0.00	0.00	0.00
Brewer's Blackbird	1.50	11.00	0.25	1.83	0.00	1.00	0.00	0.20
Brown-headed Cowbird	0.50	7.50	0.08	1.25	0.00	1.00	0.00	0.20
Purple Finch	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.10
Cassin's Finch	0.00	1.00	0.00	0.17	0.00	1.50	0.00	0.30
Lesser Goldfinch	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.10
Evening Grosbeak	0.00	0.50	0.00	0.08	0.00	0.00	0.00	0.00

^aNumber of individuals detected at the meadow, averaged across 2 survey visits. ^bNumber of individual birds detected divided by the number of survey stations and visits. ^cOnly includes birds detected within 50m of a survey point. ^dAll birds detected regardless of distance from survey station. ^eMeadow focal species indicated in bold text.

Table C-6. Number of birds detected during point counts at Upper Bear Valley and Lower Bear Valley.

Species ^e	Upper Bear Valley (n = 10 survey station)				Lower Bear Valley (n = 8 survey station)			
	Avg. No. of Birds Detected ^a		Avg. No. of Birds per Station ^b		Avg. No. of Birds Detected ^a		Avg. No. of Birds per Station ^b	
	<50m ^c	Unlimited Radius ^d	<50m ^c	Unlimited Radius ^d	<50m ^c	Unlimited Radius ^d	<50m ^c	Unlimited Radius ^d
Mallard	0.00	0.00	0.00	0.00	0.50	0.50	0.06	0.06
Mountain Quail	0.00	14.50	0.00	1.45	1.50	10.00	0.19	1.25
California Quail	1.50	2.00	0.15	0.20	0.00	0.50	0.00	0.06
Red-tailed Hawk	0.00	1.00	0.00	0.10	0.00	0.00	0.00	0.00
Killdeer	0.50	0.50	0.05	0.05	0.00	0.00	0.00	0.00
Spotted Sandpiper	0.50	1.50	0.05	0.15	0.00	0.00	0.00	0.00
Wilson's Snipe	2.00	3.00	0.20	0.30	0.00	0.00	0.00	0.00
Mourning Dove	0.00	3.00	0.00	0.30	2.00	5.00	0.25	0.63
Calliope Hummingbird	0.50	0.50	0.05	0.05	0.00	0.00	0.00	0.00
Red-breasted Sapsucker	0.00	0.00	0.00	0.00	1.00	1.50	0.13	0.19
Nuttall's Woodpecker	0.00	0.00	0.00	0.00	0.50	0.50	0.06	0.06
Hairy Woodpecker	0.00	0.50	0.00	0.05	0.00	0.00	0.00	0.00
Northern Flicker	1.00	6.50	0.10	0.65	0.50	3.00	0.06	0.38
Olive-sided Flycatcher	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.06
Western Wood-Pewee	1.00	10.00	0.10	1.00	3.50	14.50	0.44	1.81
Hammond's Flycatcher	0.00	0.00	0.00	0.00	0.50	0.50	0.06	0.06
Dusky Flycatcher	0.00	1.00	0.00	0.10	0.50	0.50	0.06	0.06
Pacific-slope Flycatcher	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.13
Cassin's Vireo	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.06
Hutton's Vireo	0.00	0.50	0.00	0.05	0.50	0.50	0.06	0.06
Warbling Vireo	2.50	4.50	0.25	0.45	5.00	10.50	0.63	1.31
Steller's Jay	0.50	4.00	0.05	0.40	1.00	5.50	0.13	0.69
Clark's Nutcracker	1.00	2.50	0.10	0.25	0.00	3.50	0.00	0.44
Common Raven	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.13
Tree Swallow	1.50	1.50	0.15	0.15	0.00	0.00	0.00	0.00
Violet-green Swallow	0.00	0.50	0.00	0.05	0.00	0.00	0.00	0.00
Mountain Chickadee	6.00	9.00	0.60	0.90	2.50	13.50	0.31	1.69
Red-breasted Nuthatch	0.00	0.50	0.00	0.05	0.00	1.00	0.00	0.13
White-breasted Nuthatch	0.00	0.50	0.00	0.05	0.00	2.00	0.00	0.25

Species ^e	Upper Bear Valley (n = 10 survey station)				Lower Bear Valley (n = 8 survey station)			
	Avg. No. of Birds Detected ^a		Avg. No. of Birds per Station ^b		Avg. No. of Birds Detected ^a		Avg. No. of Birds per Station ^b	
	<50m ^c	Unlimited Radius ^d	<50m ^c	Unlimited Radius ^d	<50m ^c	Unlimited Radius ^d	<50m ^c	Unlimited Radius ^d
Brown Creeper	0.00	0.00	0.00	0.00	0.50	1.00	0.06	0.13
House Wren	4.50	7.00	0.45	0.70	4.00	7.00	0.50	0.88
Golden-crowned Kinglet	0.50	0.50	0.05	0.05	0.00	0.50	0.00	0.06
Townsend's Solitaire	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.06
American Robin	11.00	23.00	1.10	2.30	5.50	13.50	0.69	1.69
Orange-crowned Warbler	0.50	0.50	0.05	0.05	0.00	0.00	0.00	0.00
Yellow Warbler	4.50	7.00	0.45	0.70	4.00	7.50	0.50	0.94
Yellow-rumped Warbler	0.00	1.50	0.00	0.15	0.00	0.50	0.00	0.06
MacGillivray's Warbler	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.13
Wilson's Warbler	0.50	1.00	0.05	0.10	0.00	0.50	0.00	0.06
Green-tailed Towhee	2.50	5.50	0.25	0.55	3.00	5.00	0.38	0.63
Chipping Sparrow	0.00	0.00	0.00	0.00	0.50	0.50	0.06	0.06
Brewer's Sparrow	1.00	7.00	0.10	0.70	0.00	0.00	0.00	0.00
Vesper Sparrow	0.50	1.00	0.05	0.10	0.00	0.00	0.00	0.00
Fox Sparrow	2.50	8.50	0.25	0.85	3.50	9.00	0.44	1.13
Song Sparrow	3.50	10.50	0.35	1.05	6.00	10.50	0.75	1.31
Lincoln's Sparrow	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.06
White-crowned Sparrow	1.00	8.50	0.10	0.85	1.50	4.50	0.19	0.56
Dark-eyed Junco	0.50	2.00	0.05	0.20	3.50	7.00	0.44	0.88
Black-headed Grosbeak	0.00	0.00	0.00	0.00	0.50	1.00	0.06	0.13
Lazuli Bunting	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.06
Red-winged Blackbird	5.50	17.00	0.55	1.70	0.00	0.00	0.00	0.00
Brewer's Blackbird	9.50	12.00	0.95	1.20	3.00	7.00	0.38	0.88
Brown-headed Cowbird	1.50	2.00	0.15	0.20	2.00	2.00	0.25	0.25
Cassin's Finch	1.00	1.50	0.10	0.15	0.00	0.00	0.00	0.00
Lesser Goldfinch	0.50	0.50	0.05	0.05	2.00	2.50	0.25	0.31

^aNumber of individuals detected at the meadow, averaged across 2 survey visits. ^bNumber of individual birds detected divided by the number of survey stations and visits. ^cOnly includes birds detected within 50m of a survey point. ^dAll birds detected regardless of distance from survey station. ^eMeadow focal species indicated in bold text.

Table C-6. Number of birds detected during point counts at West Carman Creek and McNair Meadow.

Species ^e	West Carman Creek (n = 9 survey station)				McNair Meadow (n = 6 survey station)			
	Avg. No. of Birds Detected ^a		Avg. No. of Birds per Station ^b		Avg. No. of Birds Detected ^a		Avg. No. of Birds per Station ^b	
	<50m ^c	Unlimited Radius ^d	<50m ^c	Unlimited Radius ^d	<50m ^c	Unlimited Radius ^d	<50m ^c	Unlimited Radius ^d
Canada Goose	0.00	0.50	0.00	0.06	0.00	0.00	0.00	0.00
Sooty Grouse	0.00	0.50	0.00	0.06	0.00	0.00	0.00	0.00
Mountain Quail	0.00	3.00	0.00	0.33	0.00	0.00	0.00	0.00
California Quail	0.00	0.50	0.00	0.06	0.00	0.00	0.00	0.00
Red-tailed Hawk	0.00	0.50	0.00	0.06	0.00	0.00	0.00	0.00
Sandhill Crane	0.00	2.50	0.00	0.28	0.00	0.00	0.00	0.00
Mourning Dove	0.00	3.50	0.00	0.39	0.00	3.00	0.00	0.50
Anna's Hummingbird	0.50	0.50	0.06	0.06	0.00	0.00	0.00	0.00
Calliope Hummingbird	1.00	1.00	0.11	0.11	0.00	0.00	0.00	0.00
Red-breasted Sapsucker	0.00	1.50	0.00	0.17	1.00	2.00	0.17	0.33
Hairy Woodpecker	0.00	0.50	0.00	0.06	0.00	1.00	0.00	0.17
White-headed Woodpecker	0.50	0.50	0.06	0.06	0.00	1.00	0.00	0.17
Northern Flicker	0.50	3.50	0.06	0.39	0.00	1.00	0.00	0.17
Pileated Woodpecker	0.00	0.50	0.00	0.06	0.00	0.00	0.00	0.00
Unidentified Woodpecker	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.17
Western Wood-Pewee	1.50	10.00	0.17	1.11	4.00	11.00	0.67	1.83
Hammond's Flycatcher	0.50	0.50	0.06	0.06	0.00	2.00	0.00	0.33
Gray Flycatcher	0.00	3.00	0.00	0.33	0.00	0.00	0.00	0.00
Dusky Flycatcher	0.00	1.50	0.00	0.17	0.00	0.00	0.00	0.00
Unidentified <i>Empidonax</i>								
Flycatcher	0.00	0.50	0.00	0.06	0.00	1.00	0.00	0.17
Cassin's Vireo	0.00	1.00	0.00	0.11	0.00	0.00	0.00	0.00
Warbling Vireo	2.00	3.00	0.22	0.33	1.00	3.00	0.17	0.50
Steller's Jay	0.00	4.00	0.00	0.44	2.00	7.00	0.33	1.17
American Crow	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.17
Tree Swallow	0.00	0.00	0.00	0.00	4.00	4.00	0.67	0.67
Mountain Chickadee	1.00	13.00	0.11	1.44	4.00	11.00	0.67	1.83
Red-breasted Nuthatch	0.00	10.00	0.00	1.11	0.00	7.00	0.00	1.17
Pygmy Nuthatch	0.00	4.00	0.00	0.44	0.00	0.00	0.00	0.00

Species ^e	West Carman Creek (n = 9 survey station)				McNair Meadow (n = 6 survey station)			
	Avg. No. of Birds Detected ^a		Avg. No. of Birds per Station ^b		Avg. No. of Birds Detected ^a		Avg. No. of Birds per Station ^b	
	<50m ^c	Unlimited Radius ^d	<50m ^c	Unlimited Radius ^d	<50m ^c	Unlimited Radius ^d	<50m ^c	Unlimited Radius ^d
Brown Creeper	0.00	5.00	0.00	0.56	1.00	3.00	0.17	0.50
House Wren	0.50	1.00	0.06	0.11	0.00	0.00	0.00	0.00
Golden-crowned Kinglet	0.00	0.00	0.00	0.00	2.00	2.00	0.33	0.33
Mountain Bluebird	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.17
Townsend's Solitaire	0.00	2.00	0.00	0.22	0.00	1.00	0.00	0.17
Swainson's Thrush	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.17
American Robin	2.50	15.50	0.28	1.72	1.00	6.00	0.17	1.00
Yellow Warbler	0.00	0.50	0.00	0.06	0.00	0.00	0.00	0.00
Yellow-rumped Warbler	0.00	8.00	0.00	0.89	2.00	3.00	0.33	0.50
Hermit Warbler	0.00	2.50	0.00	0.28	3.00	8.00	0.50	1.33
MacGillivray's Warbler	0.00	0.00	0.00	0.00	1.00	1.00	0.17	0.17
Western Tanager	0.00	3.50	0.00	0.39	0.00	4.00	0.00	0.67
Chipping Sparrow	0.50	3.50	0.06	0.39	3.00	4.00	0.50	0.67
Song Sparrow	0.50	7.50	0.06	0.83	0.00	0.00	0.00	0.00
Lincoln's Sparrow	1.00	3.50	0.11	0.39	0.00	5.00	0.00	0.83
Dark-eyed Junco	3.00	8.00	0.33	0.89	3.00	3.00	0.50	0.50
Red-winged Blackbird	0.00	1.00	0.00	0.11	1.00	3.00	0.17	0.50
Brewer's Blackbird	9.50	12.50	1.06	1.39	0.00	0.00	0.00	0.00
Brown-headed Cowbird	1.00	3.00	0.11	0.33	0.00	2.00	0.00	0.33
Cassin's Finch	0.00	1.50	0.00	0.17	1.00	7.00	0.17	1.17
Unidentified <i>Carpodacus</i>								
Finch	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.17
Lesser Goldfinch	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.17
Evening Grosbeak	0.00	0.50	0.00	0.06	2.00	14.00	0.33	2.33

^aNumber of individuals detected at the meadow, averaged across 2 survey visits. ^bNumber of individual birds detected divided by the number of survey stations and visits. ^cOnly includes birds detected within 50m of a survey point. ^dAll birds detected regardless of distance from survey station. ^eMeadow focal species indicated in bold text.

Appendix D. Average number of birds detected during area searches at each site

Table D-1. Average number of birds detected during area searches at Carman Valley Folchi (345 ac./ 140 ha).

Species^a	<i>Avg. No. Of Birds Detected</i>		
	<i>Meadow</i>	<i>Upland</i>	<i>Total</i>
Canada Goose	4.0	0.0	4.0
Mallard	5.0	0.0	5.0
Mountain Quail	0.0	4.5	4.5
Pied-billed Grebe	2.0	0.0	2.0
Red-tailed Hawk	2.0	0.0	2.0
American Kestrel	0.5	0.5	1.0
Sandhill Crane	2.5	0.0	2.5
Killdeer	6.5	0.0	6.5
Wilson's Snipe	2.0	0.0	2.0
Mourning Dove	0.0	4.5	4.5
Williamson's Sapsucker	0.0	1.0	1.0
Red-breasted Sapsucker	0.0	1.5	1.5
Northern Flicker	1.0	8.5	9.5
Olive-sided Flycatcher	0.0	1.0	1.0
Western Wood-Pewee	0.0	13.5	13.5
Gray Flycatcher	0.0	1.0	1.0
Dusky Flycatcher	0.0	1.0	1.0
Steller's Jay	3.5	7.5	11.0
Common Raven	2.0	1.0	3.0
Horned Lark	15.0	0.0	15.0
Mountain Chickadee	0.0	8.0	8.0
Red-breasted Nuthatch	0.0	5.5	5.5
White-breasted Nuthatch	0.0	1.5	1.5
Brown Creeper	0.0	1.0	1.0
House Wren	0.0	2.0	2.0
Western Bluebird	1.0	1.0	2.0
American Robin	8.5	7.0	15.5
European Starling	1.0	5.0	6.0
Yellow-rumped Warbler	0.0	2.0	2.0
Western Tanager	4.5	3.5	8.0
Green-tailed Towhee	0.0	1.0	1.0
Chipping Sparrow	0.0	4.5	4.5
Brewer's Sparrow	12.0	0.0	12.0
Vesper Sparrow	17.5	0.0	17.5
Savannah Sparrow	2.0	0.0	2.0
Lincoln's Sparrow	1.0	0.0	1.0
Dark-eyed Junco	0.0	2.5	2.5
Red-winged Blackbird	3.5	0.0	3.5
Western Meadowlark	27.0	0.0	27.0
Brewer's Blackbird	28.0	0.0	28.0
Brown-headed Cowbird	2.5	1.0	3.5
Evening Grosbeak	0.0	4.0	4.0

^aMeadow-associated focal species are indicated in bold text.

Table D-2. Average number of birds detected during area searches at Ross Ranch Meadow (159 ac./ 65 ha).

<i>Species^a</i>	<i>Avg. No. Of Birds Detected</i>		
	<i>Meadow</i>	<i>Upland</i>	<i>Total</i>
Mountain Quail	0.0	7.0	7.0
American Kestrel	0.0	1.0	1.0
Killdeer	1.0	0.0	1.0
Mourning Dove	0.0	3.0	3.0
Red-breasted Sapsucker	0.0	1.0	1.0
Hairy Woodpecker	0.0	1.0	1.0
Northern Flicker	0.0	3.0	3.0
Pileated Woodpecker	0.0	1.0	1.0
Olive-sided Flycatcher	0.0	1.0	1.0
Western Wood-Pewee	0.0	17.0	17.0
Gray Flycatcher	0.0	2.0	2.0
Cassin's Vireo	0.0	1.0	1.0
Steller's Jay	0.0	14.0	14.0
Black-billed Magpie	1.0	0.0	1.0
Common Raven	0.0	1.0	1.0
Mountain Chickadee	0.0	6.0	6.0
Red-breasted Nuthatch	0.0	4.0	4.0
White-breasted Nuthatch	0.0	2.0	2.0
Brown Creeper	0.0	3.0	3.0
House Wren	0.0	2.0	2.0
Mountain Bluebird	5.0	0.0	5.0
Townsend's Solitaire	0.0	1.0	1.0
American Robin	3.0	10.0	13.0
Yellow-rumped Warbler	0.0	6.0	6.0
MacGillivray's Warbler	0.0	1.0	1.0
Western Tanager	0.0	3.0	3.0
Green-tailed Towhee	2.0	9.0	11.0
Spotted Towhee	4.0	2.0	6.0
Chipping Sparrow	0.0	10.0	10.0
Vesper Sparrow	6.0	0.0	6.0
Savannah Sparrow	5.0	0.0	5.0
Lincoln's Sparrow	1.0	0.0	1.0
Dark-eyed Junco	0.0	10.0	10.0
Black-headed Grosbeak	0.0	2.0	2.0
Red-winged Blackbird	5.0	0.0	5.0
Western Meadowlark	12.0	1.0	13.0
Brewer's Blackbird	9.0	0.0	9.0
Brown-headed Cowbird	2.0	1.0	3.0
Cassin's Finch	0.0	4.0	4.0
Lesser Goldfinch	0.0	2.0	2.0
Evening Grosbeak	0.0	3.0	3.0

^aMeadow-associated focal species are indicated in bold text.

Table D-3. Average number of birds detected during area searches Davies Creek – Site 1 (25 ac./10 ha).

Species^a	Avg. No. Of Birds Detected		
	Meadow	Upland	Total
Sooty Grouse	0.0	1.0	1.0
Mountain Quail	0.0	1.0	1.0
Common Nighthawk	0.0	1.0	1.0
Anna's Hummingbird	2.0	0.0	2.0
Calliope Hummingbird	1.0	0.0	1.0
Rufous Hummingbird	6.0	0.0	6.0
Williamson's Sapsucker	0.0	4.0	4.0
Hairy Woodpecker	0.0	2.0	2.0
Northern Flicker	0.0	1.0	1.0
Western Wood-Pewee	0.5	5.5	6.0
Hammond's Flycatcher	1.0	0.0	1.0
Dusky Flycatcher	1.0	0.5	1.5
Cassin's Vireo	0.0	1.0	1.0
Warbling Vireo	5.0	0.5	5.5
Steller's Jay	0.0	1.5	1.5
Clark's Nutcracker	0.0	1.0	1.0
Common Raven	1.0	0.0	1.0
Mountain Chickadee	2.5	4.5	7.0
Red-breasted Nuthatch	0.5	4.5	5.0
White-breasted Nuthatch	0.0	1.0	1.0
Brown Creeper	0.0	2.0	2.0
Ruby-crowned Kinglet	0.0	1.5	1.5
Townsend's Solitaire	0.0	2.0	2.0
Hermit Thrush	0.0	2.0	2.0
American Robin	4.0	1.0	5.0
Nashville Warbler	0.0	1.0	1.0
Yellow Warbler	5.0	0.0	5.0
Yellow-rumped Warbler	1.0	0.0	1.0
MacGillivray's Warbler	2.0	1.0	3.0
Western Tanager	3.0	0.5	3.5
Green-tailed Towhee	10.0	2.5	12.5
Chipping Sparrow	1.0	1.0	2.0
Brewer's Sparrow	1.0	0.0	1.0
Song Sparrow	6.0	0.0	6.0
White-crowned Sparrow	7.0	0.5	7.5
Dark-eyed Junco	10.0	3.5	13.5
Black-headed Grosbeak	0.0	1.0	1.0
Brown-headed Cowbird	2.0	0.0	2.0
Cassin's Finch	0.5	2.0	2.5

^aMeadow-associated focal species are indicated in bold text.

Table D-4. Average number of birds detected during area searches at Trossi Canyon (38 ac./15 ha).

Species^a	Avg. No. Of Birds Detected		
	Meadow	Upland	Total
Mountain Quail	0.0	2.0	2.0
California Quail	0.0	2.0	2.0
Red-tailed Hawk	1.0	0.0	1.0
Rufous Hummingbird	1.0	0.0	1.0
Williamson's Sapsucker	0.0	2.0	2.0
Hairy Woodpecker	0.0	1.0	1.0
Northern Flicker	0.0	1.5	1.5
Olive-sided Flycatcher	0.0	1.0	1.0
Western Wood-Pewee	0.0	2.5	2.5
Warbling Vireo	0.0	3.0	3.0
Steller's Jay	0.0	2.5	2.5
Clark's Nutcracker	0.0	5.0	5.0
Mountain Chickadee	2.5	7.5	10.0
Red-breasted Nuthatch	0.0	2.5	2.5
Brown Creeper	0.0	1.0	1.0
House Wren	2.0	1.0	3.0
American Robin	3.5	3.5	7.0
Yellow-rumped Warbler	0.0	3.0	3.0
Green-tailed Towhee	2.0	2.0	4.0
Chipping Sparrow	1.0	1.0	2.0
Brewer's Sparrow	1.0	0.0	1.0
Fox Sparrow	0.0	2.0	2.0
Lincoln's Sparrow	2.0	0.0	2.0
White-crowned Sparrow	4.0	0.5	4.5
Dark-eyed Junco	5.5	5.0	10.5
Brewer's Blackbird	2.0	0.0	2.0
Cassin's Finch	0.0	3.0	3.0

^aMeadow-associated focal species are indicated in bold text.

Table D-5. Average number of birds detected during area searches at Perazzo Middle Meadow (241 ac./98 ha).

<i>Species^a</i>	<i>Avg. No. Of Birds Detected</i>		
	<i>Meadow</i>	<i>Upland</i>	<i>Total</i>
Mallard	2.50	0.00	2.50
Cinnamon Teal	2.00	0.00	2.00
Northern Pintail	1.00	0.00	1.00
Green-winged Teal	1.00	0.00	1.00
Common Merganser	7.00	0.00	7.00
Osprey	1.00	0.00	1.00
Red-tailed Hawk	0.50	1.50	2.00
Killdeer	1.00	0.00	1.00
Spotted Sandpiper	15.00	0.00	15.00
Wilson's Snipe	8.50	0.00	8.50
Calliope Hummingbird	9.00	0.00	9.00
Rufous Hummingbird	2.00	0.00	2.00
Red-breasted Sapsucker	2.50	2.00	4.50
Hairy Woodpecker	0.00	2.00	2.00
Northern Flicker	1.50	5.00	6.50
Olive-sided Flycatcher	0.00	1.00	1.00
Western Wood-Pewee	1.00	10.00	11.00
Willow Flycatcher	6.00	0.00	6.00
Dusky Flycatcher	9.50	5.00	14.50
Warbling Vireo	5.00	7.50	12.50
Steller's Jay	0.00	5.00	5.00
Clark's Nutcracker	1.00	5.00	6.00
Common Raven	0.00	8.00	8.00
Tree Swallow	4.00	0.00	4.00
Mountain Chickadee	1.50	7.00	8.50
Red-breasted Nuthatch	0.00	2.00	2.00
Brown Creeper	0.00	1.00	1.00
House Wren	1.00	0.00	1.00
American Robin	12.00	9.00	21.00
Nashville Warbler	1.00	0.00	1.00
Yellow Warbler	31.50	1.00	32.50
Yellow-rumped Warbler	2.00	5.00	7.00
MacGillivray's Warbler	2.50	1.00	3.50
Wilson's Warbler	16.00	2.00	18.00
Western Tanager	0.00	1.00	1.00
Green-tailed Towhee	2.00	2.00	4.00
Spotted Towhee	0.00	2.00	2.00
Chipping Sparrow	0.00	1.00	1.00
Vesper Sparrow	1.00	0.00	1.00
Savannah Sparrow	3.50	0.00	3.50
Song Sparrow	20.50	0.00	20.50
Lincoln's Sparrow	10.50	2.00	12.50
White-crowned Sparrow	26.00	2.00	28.00
Dark-eyed Junco	4.00	11.00	15.00
Black-headed Grosbeak	0.00	1.00	1.00
Red-winged Blackbird	26.50	0.00	26.50
Brewer's Blackbird	15.50	0.50	16.00
Brown-headed Cowbird	7.00	1.50	8.50
Cassin's Finch	0.00	2.00	2.00
Lesser Goldfinch	0.00	3.00	3.00

Species^a	Avg. No. Of Birds Detected		
	Meadow	Upland	Total
Evening Grosbeak	1.00	3.00	4.00
Unidentified Species	2.00	0.00	2.00

^aMeadow-associated focal species are indicated in bold text.

Table D-6. Average number of birds detected during area searches at Little Truckee River Above Stampede Res. (79 ac./32 ha).

<i>Species^a</i>	<i>Avg. No. Of Birds Detected</i>		
	<i>Meadow</i>	<i>Upland</i>	<i>Total</i>
Common Merganser	2.0	0.0	2.0
Mountain Quail	1.0	1.0	2.0
California Quail	1.0	0.0	1.0
Killdeer	2.5	0.0	2.5
Spotted Sandpiper	3.0	0.0	3.0
Mourning Dove	1.0	0.0	1.0
Calliope Hummingbird	1.0	0.0	1.0
Red-breasted Sapsucker	2.0	0.0	2.0
Northern Flicker	0.0	1.5	1.5
Western Wood-Pewee	0.5	2.5	3.0
Willow Flycatcher	1.5	0.0	1.5
Warbling Vireo	2.0	0.0	2.0
Steller's Jay	0.0	2.0	2.0
Clark's Nutcracker	0.0	1.0	1.0
Common Raven	2.0	0.0	2.0
Tree Swallow	5.5	0.0	5.5
Mountain Chickadee	0.5	2.5	3.0
Red-breasted Nuthatch	0.0	1.0	1.0
American Robin	3.5	0.0	3.5
European Starling	2.0	0.0	2.0
Yellow Warbler	11.5	0.0	11.5
Wilson's Warbler	1.0	0.0	1.0
Brewer's Sparrow	2.5	0.0	2.5
Fox Sparrow	3.5	0.0	3.5
Song Sparrow	10.5	0.0	10.5
White-crowned Sparrow	4.5	0.0	4.5
Brewer's Blackbird	2.0	0.0	2.0
Brown-headed Cowbird	1.0	0.0	1.0

^aMeadow-associated focal species are indicated in bold text.

Table D-7. Average number of birds detected during area searches at Little Truckee River below Stampede Res. (317 ac./128 ha).

<i>Species^a</i>	<i>Avg. No. Of Birds Detected</i>		
	<i>Meadow</i>	<i>Upland</i>	<i>Total</i>
Canada Goose	1.0	0.0	1.0
Mallard	2.0	0.0	2.0
Common Merganser	3.0	0.0	3.0
Mountain Quail	4.5	0.5	5.0
California Quail	6.5	3.5	10.0
Red-tailed Hawk	1.0	1.0	2.0
Spotted Sandpiper	8.0	0.0	8.0
California Gull	5.0	0.0	5.0
Mourning Dove	2.0	0.0	2.0
Belted Kingfisher	2.0	0.0	2.0
Red-breasted Sapsucker	0.0	1.0	1.0
Northern Flicker	4.0	2.0	6.0
Olive-sided Flycatcher	0.0	3.0	3.0
Western Wood-Pewee	2.0	7.5	9.5
Warbling Vireo	2.0	0.5	2.5
Steller's Jay	0.0	5.5	5.5
Clark's Nutcracker	0.0	1.0	1.0
Common Raven	2.0	1.0	3.0
Horned Lark	3.0	0.0	3.0
Tree Swallow	2.0	0.0	2.0
Northern Rough-winged Swallow	8.0	0.0	8.0
Cliff Swallow	2.5	0.0	2.5
Mountain Chickadee	1.0	2.5	3.5
House Wren	2.0	0.0	2.0
American Robin	8.5	2.5	11.0
European Starling	8.0	0.0	8.0
Yellow Warbler	17.0	1.0	18.0
Yellow-rumped Warbler	2.0	4.0	6.0
MacGillivray's Warbler	2.5	0.0	2.5
Wilson's Warbler	3.0	0.0	3.0
Green-tailed Towhee	6.0	0.5	6.5
Chipping Sparrow	1.0	0.0	1.0
Brewer's Sparrow	6.5	0.0	6.5
Vesper Sparrow	5.5	0.0	5.5
Fox Sparrow	6.0	0.0	6.0
Song Sparrow	14.0	0.0	14.0
Lincoln's Sparrow	1.0	0.0	1.0
White-crowned Sparrow	5.0	0.5	5.5
Dark-eyed Junco	0.5	3.5	4.0
Red-winged Blackbird	6.0	0.0	6.0
Brewer's Blackbird	14.0	0.0	14.0
Brown-headed Cowbird	5.5	2.0	7.5
Lesser Goldfinch	5.0	0.0	5.0

^aMeadow-associated focal species are indicated in bold text.

Table D-8. Average number of birds detected during area searches at Perazzo Terrace Meadow (56 ac./23 ha).

Species^a	Avg. No. Of Birds Detected		
	Meadow	Upland	Total
Canada Goose	2.0	0.0	2.0
Mallard	2.0	0.0	2.0
Common Merganser	1.0	0.0	1.0
Mountain Quail	0.0	3.0	3.0
Cooper's Hawk	1.0	0.0	1.0
Red-tailed Hawk	1.0	0.0	1.0
Wilson's Snipe	2.5	0.0	2.5
Vaux's Swift	1.0	0.0	1.0
Calliope Hummingbird	4.0	0.0	4.0
Williamson's Sapsucker	0.0	1.0	1.0
Red-breasted Sapsucker	1.0	3.0	4.0
Northern Flicker	0.0	4.0	4.0
Pileated Woodpecker	0.0	1.0	1.0
Western Wood-Pewee	0.0	11.5	11.5
Dusky Flycatcher	0.0	9.0	9.0
Warbling Vireo	5.5	3.5	9.0
Steller's Jay	0.0	2.0	2.0
Clark's Nutcracker	0.0	2.0	2.0
Common Raven	1.5	0.0	1.5
Violet-green Swallow	1.0	0.0	1.0
Mountain Chickadee	2.0	10.0	12.0
Red-breasted Nuthatch	0.0	2.5	2.5
Brown Creeper	0.0	3.5	3.5
House Wren	0.0	2.0	2.0
Western Bluebird	1.0	0.0	1.0
Townsend's Solitaire	0.0	1.0	1.0
American Robin	12.0	5.5	17.5
Yellow Warbler	6.5	0.0	6.5
Yellow-rumped Warbler	2.0	6.0	8.0
MacGillivray's Warbler	2.5	0.5	3.0
Wilson's Warbler	6.0	0.0	6.0
Western Tanager	0.0	2.0	2.0
Green-tailed Towhee	3.5	0.5	4.0
Chipping Sparrow	0.0	4.0	4.0
Brewer's Sparrow	4.0	0.0	4.0
Savannah Sparrow	5.0	0.0	5.0
Song Sparrow	5.0	0.0	5.0
Lincoln's Sparrow	9.5	1.5	11.0
White-crowned Sparrow	15.5	3.0	18.5
Dark-eyed Junco	0.5	9.0	9.5
Black-headed Grosbeak	0.0	1.0	1.0
Red-winged Blackbird	5.0	0.0	5.0
Brewer's Blackbird	9.5	1.5	11.0
Brown-headed Cowbird	6.5	3.0	9.5
Cassin's Finch	0.0	8.0	8.0
Pine Siskin	0.0	4.0	4.0
Evening Grosbeak	0.0	4.0	4.0

^aMeadow-associated focal species are indicated in bold text.

Table D-9. Average number of birds detected during area searches at Little Truckee West (69 ac./28 ha).

<i>Species^a</i>	<i>Avg. No. Of Birds Detected</i>		
	<i>Meadow</i>	<i>Upland</i>	<i>Total</i>
Common Merganser	1.0	0.0	1.0
Spotted Sandpiper	2.0	0.0	2.0
Red-breasted Sapsucker	1.0	0.0	1.0
Hairy Woodpecker	0.0	1.5	1.5
Northern Flicker	0.0	1.0	1.0
Western Wood-Pewee	1.5	2.0	3.5
Dusky Flycatcher	3.0	0.0	3.0
Warbling Vireo	1.5	2.0	3.5
Clark's Nutcracker	0.0	1.5	1.5
Mountain Chickadee	0.5	3.5	4.0
Brown Creeper	0.0	3.0	3.0
Golden-crowned Kinglet	0.0	1.0	1.0
Hermit Thrush	0.0	1.5	1.5
American Robin	4.0	4.5	8.5
Yellow Warbler	3.0	0.5	3.5
Yellow-rumped Warbler	0.0	4.0	4.0
Hermit Warbler	0.0	1.0	1.0
Wilson's Warbler	1.0	0.0	1.0
Green-tailed Towhee	3.0	0.0	3.0
Spotted Towhee	0.0	1.0	1.0
Chipping Sparrow	3.0	0.0	3.0
Savannah Sparrow	4.0	0.0	4.0
Fox Sparrow	1.0	0.0	1.0
Song Sparrow	2.5	0.0	2.5
Lincoln's Sparrow	4.0	1.0	5.0
White-crowned Sparrow	4.0	0.0	4.0
Dark-eyed Junco	0.5	3.5	4.0
Brewer's Blackbird	3.0	0.0	3.0
Brown-headed Cowbird	3.0	1.0	4.0
Cassin's Finch	1.0	0.0	1.0

^aMeadow-associated focal species are indicated in bold text.

Table D-10. Average number of birds detected during area searches at Upper Bear Valley (120 ac./49 ha).

<i>Species^a</i>	<i>Avg. No. Of Birds Detected</i>		
	<i>Meadow</i>	<i>Upland</i>	<i>Total</i>
Mountain Quail	0.0	8.5	8.5
California Quail	1.5	1.5	3.0
Red-tailed Hawk	0.0	1.0	1.0
American Kestrel	0.0	1.0	1.0
Killdeer	2.0	0.0	2.0
Spotted Sandpiper	2.0	0.0	2.0
Wilson's Snipe	1.5	0.0	1.5
Mourning Dove	0.0	3.0	3.0
Common Nighthawk	1.0	0.0	1.0
Calliope Hummingbird	2.0	0.0	2.0
Red-breasted Sapsucker	1.0	1.0	2.0
Hairy Woodpecker	0.0	2.0	2.0
White-headed Woodpecker	1.0	0.0	1.0
Northern Flicker	0.0	4.5	4.5
Olive-sided Flycatcher	0.0	1.0	1.0
Western Wood-Pewee	0.0	7.0	7.0
Hammond's Flycatcher	0.0	1.0	1.0
Dusky Flycatcher	1.0	4.0	5.0
Unidentified Flycatcher	0.0	1.0	1.0
Hutton's Vireo	0.0	1.0	1.0
Warbling Vireo	4.5	1.5	6.0
Steller's Jay	0.0	3.0	3.0
Clark's Nutcracker	0.5	3.0	3.5
Tree Swallow	1.5	0.0	1.5
Mountain Chickadee	0.5	4.5	5.0
Red-breasted Nuthatch	0.0	2.0	2.0
White-breasted Nuthatch	0.0	1.0	1.0
Brown Creeper	0.0	3.0	3.0
House Wren	0.5	4.5	5.0
Golden-crowned Kinglet	0.0	1.0	1.0
American Robin	12.0	9.5	21.5
Orange-crowned Warbler	5.0	0.0	5.0
Yellow Warbler	10.0	0.0	10.0
Wilson's Warbler	3.0	1.0	4.0
Green-tailed Towhee	3.0	3.5	6.5
Chipping Sparrow	3.0	0.0	3.0
Brewer's Sparrow	14.0	0.0	14.0
Vesper Sparrow	3.0	0.0	3.0
Fox Sparrow	2.5	4.5	7.0
Song Sparrow	11.5	0.0	11.5
Lincoln's Sparrow	1.0	0.0	1.0
White-crowned Sparrow	8.0	2.5	10.5
Dark-eyed Junco	0.0	4.0	4.0
Red-winged Blackbird	12.5	0.0	12.5
Brewer's Blackbird	18.5	0.5	19.0
Brown-headed Cowbird	2.5	2.0	4.5
Cassin's Finch	1.0	0.5	1.5
Lesser Goldfinch	2.0	0.0	2.0

^aMeadow-associated focal species are indicated in bold text.

Table D-11. Average number of birds detected during area searches at Lower Bear Valley (47 ac./19 ha).

<i>Species^a</i>	<i>Avg. No. Of Birds Detected</i>		
	<i>Meadow</i>	<i>Upland</i>	<i>Total</i>
Mallard	1.0	0.0	1.0
Mountain Quail	0.0	3.0	3.0
Prairie Falcon	1.0	0.0	1.0
Mourning Dove	0.0	3.0	3.0
Common Nighthawk	1.0	1.0	2.0
Red-breasted Sapsucker	1.0	1.0	2.0
Northern Flicker	0.5	3.5	4.0
Olive-sided Flycatcher	1.0	1.0	2.0
Western Wood-Pewee	1.0	10.0	11.0
Dusky Flycatcher	0.0	2.0	2.0
Warbling Vireo	6.0	0.0	6.0
Clark's Nutcracker	0.0	1.0	1.0
Common Raven	1.0	1.0	2.0
Tree Swallow	1.0	0.0	1.0
Mountain Chickadee	2.5	4.5	7.0
White-breasted Nuthatch	0.0	1.0	1.0
Brown Creeper	0.0	2.0	2.0
House Wren	4.5	2.5	7.0
Golden-crowned Kinglet	0.0	1.0	1.0
American Robin	5.5	2.5	8.0
Yellow Warbler	6.5	1.5	8.0
MacGillivray's Warbler	2.0	0.0	2.0
Western Tanager	1.0	0.0	1.0
Green-tailed Towhee	2.5	1.5	4.0
Chipping Sparrow	1.0	1.0	2.0
Brewer's Sparrow	0.0	1.0	1.0
Fox Sparrow	4.0	1.5	5.5
Song Sparrow	7.0	1.0	8.0
White-crowned Sparrow	1.5	0.5	2.0
Dark-eyed Junco	1.5	6.5	8.0
Lazuli Bunting	0.0	1.0	1.0
Brewer's Blackbird	1.5	2.5	4.0
Brown-headed Cowbird	0.0	1.0	1.0
Cassin's Finch	0.0	1.0	1.0
Lesser Goldfinch	0.0	1.0	1.0

^aMeadow-associated focal species are indicated in bold text.

Table D-12. Average number of birds detected during area searches at West Carman Creek (53 ac./22 ha).

<i>Species^a</i>	<i>Avg. No. Of Birds Detected</i>		
	<i>Meadow</i>	<i>Upland</i>	<i>Total</i>
Mallard	2.0	0.0	2.0
Sooty Grouse	0.0	1.0	1.0
Mountain Quail	0.0	1.5	1.5
Red-tailed Hawk	1.0	1.0	2.0
Sandhill Crane	2.0	0.0	2.0
Mourning Dove	0.0	3.0	3.0
Common Nighthawk	0.0	1.0	1.0
Anna's Hummingbird	1.0	0.0	1.0
Calliope Hummingbird	2.0	0.5	2.5
Red-breasted Sapsucker	1.0	0.0	1.0
White-headed Woodpecker	0.0	1.5	1.5
Northern Flicker	0.0	5.5	5.5
Pileated Woodpecker	0.0	1.0	1.0
Western Wood-Pewee	1.0	8.5	9.5
Hammond's Flycatcher	0.0	1.0	1.0
Gray Flycatcher	0.0	7.0	7.0
Dusky Flycatcher	0.0	3.0	3.0
Cassin's Vireo	0.0	1.0	1.0
Warbling Vireo	2.0	0.5	2.5
Steller's Jay	0.5	3.5	4.0
Mountain Chickadee	0.5	16.0	16.5
Red-breasted Nuthatch	0.0	10.0	10.0
White-breasted Nuthatch	0.0	1.0	1.0
Brown Creeper	0.0	7.0	7.0
House Wren	0.0	1.0	1.0
Golden-crowned Kinglet	0.0	1.0	1.0
Western Bluebird	0.0	1.0	1.0
Townsend's Solitaire	0.0	3.0	3.0
American Robin	5.5	8.0	13.5
Nashville Warbler	0.0	1.5	1.5
Yellow Warbler	3.0	0.0	3.0
Yellow-rumped Warbler	0.0	8.5	8.5
Hermit Warbler	0.0	1.5	1.5
Western Tanager	0.0	5.0	5.0
Chipping Sparrow	1.0	5.0	6.0
Song Sparrow	7.5	0.0	7.5
Lincoln's Sparrow	3.0	0.0	3.0
Dark-eyed Junco	1.5	12.5	14.0
Red-winged Blackbird	1.0	0.0	1.0
Brewer's Blackbird	18.0	1.5	19.5
Brown-headed Cowbird	2.5	3.0	5.5
Cassin's Finch	0.0	7.0	7.0
Lesser Goldfinch	0.5	4.0	4.5
Evening Grosbeak	0.0	1.0	1.0

^aMeadow-associated focal species are indicated in bold text.

Table D-13. Average number of birds detected during area searches at McNair Meadow (43 ac./17 ha).

<i>Species^a</i>	<i>Avg. No. Of Birds Detected</i>		
	<i>Meadow</i>	<i>Upland</i>	<i>Total</i>
Mallard	1.0	0.0	1.0
Mountain Quail	0.0	1.0	1.0
Northern Flicker	1.0	1.0	2.0
Western Wood-Pewee	0.0	9.0	9.0
Hammond's Flycatcher	0.0	2.0	2.0
Gray Flycatcher	0.0	1.0	1.0
Dusky Flycatcher	0.0	1.0	1.0
Cassin's Vireo	0.0	2.0	2.0
Steller's Jay	0.0	1.0	1.0
Common Raven	1.0	0.0	1.0
Tree Swallow	5.0	0.0	5.0
Mountain Chickadee	5.0	1.0	6.0
Red-breasted Nuthatch	0.0	3.0	3.0
Brown Creeper	0.0	1.0	1.0
Golden-crowned Kinglet	0.0	1.0	1.0
Mountain Bluebird	3.0	0.0	3.0
Townsend's Solitaire	0.0	1.0	1.0
American Robin	1.0	0.0	1.0
Yellow-rumped Warbler	0.0	2.0	2.0
Hermit Warbler	1.0	5.0	6.0
Wilson's Warbler	0.0	1.0	1.0
Western Tanager	0.0	2.0	2.0
Chipping Sparrow	1.0	1.0	2.0
Lincoln's Sparrow	6.0	0.0	6.0
Dark-eyed Junco	7.0	2.0	9.0
Red-winged Blackbird	1.0	0.0	1.0
Brown-headed Cowbird	1.0	0.0	1.0
Cassin's Finch	2.0	1.0	3.0
Evening Grosbeak	2.0	0.0	2.0

^aMeadow-associated focal species are indicated in bold text.

Appendix E. All bird species detected during point counts and area searches at each meadow

Table E-1. All bird species detected during point counts and area searches at each meadow.

Species^a	No. Of Meadows with Detections	Carmen Valley - Folchi	West Carman Creek	Davies Creek - Site 1	Lower Bear Valley	Little Truckee Above Stampede Res.	Little Truckee Below Stampede Res.	Little Truckee West	McNair Meadow	Perazzo Middle Meadow	Perazzo Terrace Meadow	Ross Ranch Meadow	Smithneck/Bear Valley	Trossi Canyon
Canada Goose	6	X	X			X	X				X	X		
Mallard	8	X	X		X		X	X	X	X	X			
Cinnamon Teal	2	X								X				
Northern Pintail	1									X				
Green-winged Teal	1									X				
Common Merganser	5					X	X	X		X	X			
Unidentified Duck	1	X												
Sooty Grouse	2		X	X										
Mountain Quail	13	X	X	X	X	X	X	X	X	X	X	X	X	X
California Quail	7		X	X	X	X	X						X	X
Pied-billed Grebe	1	X												
Turkey Vulture	1						X							
Osprey	3	X					X			X				
Northern Harrier	1	X												
Cooper's Hawk	1										X			
Red-tailed Hawk	8	X	X				X			X	X	X	X	X
Unidentified Hawk	1	X												
American Kestrel	4	X					X					X	X	
Prairie Falcon	1				X									
Virginia Rail	1									X				
Sandhill Crane	3	X	X									X		
Killdeer	5	X				X				X		X	X	
Spotted Sandpiper	5					X	X	X		X			X	
Wilson's Snipe	5	X		X						X	X		X	

<i>Species^a</i>	<i>No. Of Meadows with Detections</i>	<i>Carmen Valley - Folchi</i>	<i>West Carman Creek</i>	<i>Davies Creek - Site 1</i>	<i>Lower Bear Valley</i>	<i>Little Truckee Above Stampede Res.</i>	<i>Little Truckee Below Stampede Res.</i>	<i>Little Truckee West</i>	<i>McNair Meadow</i>	<i>Perazzo Middle Meadow</i>	<i>Perazzo Terrace Meadow</i>	<i>Ross Ranch Meadow</i>	<i>Smithneck/Bear Valley</i>	<i>Trossi Canyon</i>
California Gull	2						X					X		
Mourning Dove	8	X	X		X	X	X		X			X	X	
Northern Pygmy-Owl	1	X												
Common Nighthawk	4		X	X	X								X	
Vaux's Swift	1										X			
Anna's Hummingbird	2		X	X										
Calliope Hummingbird	6		X	X		X				X	X		X	
Rufous Hummingbird	3			X						X				X
Unidentified Hummingbird	1			X										
Belted Kingfisher	1						X							
Williamson's Sapsucker	5	X		X						X	X			X
Red-breasted Sapsucker	13	X	X	X	X	X	X	X	X	X	X	X	X	X
Nuttall's Woodpecker	1				X									
Hairy Woodpecker	8		X	X				X	X	X		X	X	X
White-headed Woodpecker	6	X	X	X					X				X	X
Northern Flicker	13	X	X	X	X	X	X	X	X	X	X	X	X	X
Pileated Woodpecker	4		X							X	X	X		
Unidentified Woodpecker	1								X					
Olive-sided Flycatcher	8	X			X	X	X			X		X	X	X
Western Wood-Pewee	13	X	X	X	X	X	X	X	X	X	X	X	X	X
Willow Flycatcher	2					X				X				
Hammond's Flycatcher	7		X	X	X			X	X				X	X
Gray Flycatcher	4	X	X						X			X		
Dusky Flycatcher	10	X	X	X	X			X	X	X	X	X	X	
Pacific-slope Flycatcher	2				X			X						

Species^a	No. Of Meadows with Detections	Carmen Valley - Folchi	West Carman Creek	Davies Creek - Site 1	Lower Bear Valley	Little Truckee Above Stampede Res.	Little Truckee Below Stampede Res.	Little Truckee West	McNair Meadow	Perazzo Middle Meadow	Perazzo Terrace Meadow	Ross Ranch Meadow	Smithneck/Bear Valley	Trossi Canyon
Unidentified <i>Empidonax</i> Flycatcher	3	X	X						X					
Unidentified Flycatcher	1												X	
Cassin's Vireo	5		X	X	X				X			X		
Hutton's Vireo	4			X	X								X	X
Warbling Vireo	11		X	X	X	X	X	X	X	X	X		X	X
Steller's Jay	13	X	X	X	X	X	X	X	X	X	X	X	X	X
Clark's Nutcracker	9			X	X	X	X	X		X	X		X	X
Black-billed Magpie	1											X		
American Crow	2	X							X					
Common Raven	10	X		X	X	X	X	X	X	X	X	X		
Horned Lark	2	X					X							
Tree Swallow	6				X	X	X		X	X			X	
Violet-green Swallow	2										X		X	
Northern Rough-winged Swallow	2						X			X				
Cliff Swallow	1						X							
Mountain Chickadee	13	X	X	X	X	X	X	X	X	X	X	X	X	X
Red-breasted Nuthatch	13	X	X	X	X	X	X	X	X	X	X	X	X	X
White-breasted Nuthatch	7	X	X	X	X					X		X	X	
Pygmy Nuthatch	2		X			X								
Brown Creeper	12	X	X	X	X		X	X	X	X	X	X	X	X
House Wren	9	X	X		X		X			X	X	X	X	X
Golden-crowned Kinglet	5		X		X			X	X				X	
Ruby-crowned Kinglet	1			X										
Western Bluebird	4	X	X							X	X			

Species^a	No. Of Meadows with Detections	Carmen Valley - Folchi	West Carman Creek	Davies Creek - Site 1	Lower Bear Valley	Little Truckee Above Stampede Res.	Little Truckee Below Stampede Res.	Little Truckee West	McNair Meadow	Perazzo Middle Meadow	Perazzo Terrace Meadow	Ross Ranch Meadow	Smithneck/Bear Valley	Trossi Canyon
Mountain Bluebird	2								X			X		
Townsend's Solitaire	8		X	X	X		X		X	X	X	X		
Swainson's Thrush	2								X		X			
Hermit Thrush	3			X				X		X				
American Robin	13	X	X	X	X	X	X	X	X	X	X	X	X	X
European Starling	4	X				X	X			X				
Orange-crowned Warbler	2						X						X	
Nashville Warbler	5		X	X			X	X		X				
Yellow Warbler	9		X	X	X	X	X	X		X	X		X	
Yellow-rumped Warbler	12	X	X	X	X		X	X	X	X	X	X	X	X
Hermit Warbler	3		X					X	X					
MacGillivray's Warbler	7			X	X		X		X	X	X	X		
Wilson's Warbler	8				X	X	X	X	X	X	X		X	
Western Tanager	9	X	X	X	X				X	X	X	X		X
Green-tailed Towhee	10	X		X	X		X	X		X	X	X	X	X
Spotted Towhee	3							X		X		X		
Chipping Sparrow	12	X	X	X	X		X	X	X	X	X	X	X	X
Brewer's Sparrow	9	X		X	X	X	X	X			X		X	X
Vesper Sparrow	5	X					X			X		X	X	
Savannah Sparrow	7	X				X	X	X		X	X	X		
Fox Sparrow	7			X	X	X	X	X					X	X
Song Sparrow	11	X	X	X	X	X	X	X		X	X		X	X
Lincoln's Sparrow	11	X	X		X		X	X	X	X	X	X	X	X
White-crowned Sparrow	9			X	X	X	X	X		X	X		X	X
Dark-eyed Junco	13	X	X	X	X	X	X	X	X	X	X	X	X	X

<i>Species^a</i>	<i>No. Of Meadows with Detections</i>	<i>Carmen Valley - Folchi</i>	<i>West Carman Creek</i>	<i>Davies Creek - Site 1</i>	<i>Lower Bear Valley</i>	<i>Little Truckee Above Stampede Res.</i>	<i>Little Truckee Below Stampede Res.</i>	<i>Little Truckee West</i>	<i>McNair Meadow</i>	<i>Perazzo Middle Meadow</i>	<i>Perazzo Terrace Meadow</i>	<i>Ross Ranch Meadow</i>	<i>Smithneck/Bear Valley</i>	<i>Trossi Canyon</i>
Unidentified Sparrow	1										X			
Black-headed Grosbeak	5			X	X					X	X	X		
Lazuli Bunting	1				X									
Red-winged Blackbird	8	X	X				X		X	X	X	X	X	
Western Meadowlark	2	X										X		
Brewer's Blackbird	12	X	X	X	X	X	X	X		X	X	X	X	X
Brown-headed Cowbird	12	X	X	X	X	X	X	X	X	X	X	X	X	
Purple Finch	1							X						
Cassin's Finch	10		X	X	X			X	X	X	X	X	X	X
Unidentified <i>Carpodacus</i> Finch	1								X					
Pine Siskin	2									X	X			
Lesser Goldfinch	8		X		X		X	X	X	X		X	X	
Evening Grosbeak	6	X	X						X	X	X	X		

^aMeadow-associated focal species are indicated in bold text.