

# Sampson Creek Avian Inventory and Habitat Assessment

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April 7, 2016



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Cover photograph: Black-Headed Grosbeak was the most frequently detected bird on the Sampson Creek property during point count surveys in 2015, and is a focal species for oak and riparian habitats. Photo copyright James Livaudais 2016.

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## **Introduction**

In 2015, Klamath Bird Observatory completed an avian inventory on a 1700 ha parcel of private property along Sampson Creek in Jackson Co., OR managed by The Selberg Institute. The study objective was to document bird species presence and abundance on the property, and to complete a general habitat assessment. In addition to an increased understanding of the bird community on the property, birds provide excellent indicators of habitat quality. Because each bird species responds slightly differently to habitat change, birds provide a good metric for quantifying changes in an ecosystem. In this way, the 2015 monitoring will provide a baseline for future comparison as management of the property evolves (e.g., changes to grazing regime).

The Sampson Creek property is situated in the Cascade foothills just southeast of Ashland, OR, within the Rogue Basin. The property is contiguous with a portion of the Emigrant Lake Recreation Area, and is within approximately 2 km of the Cascade-Siskiyou National Monument. Elevation on the property ranges from around 700 m to 1600 m. The climate in the region is highly seasonal, with cold, rainy/snowy winters and hot, dry summers. According to the US Geological Survey's GAP land cover database (USGS 2011), the primary vegetation types on the property include prairie and savannah, various oak types (including Oregon white oak woodland and California black oak/conifer), oak chaparral, conifer forest, and riparian woodland.

## **Methods**

### *Sampling design*

Four survey transects were identified on aerial maps by The Selberg Institute, subjectively selected to cross the dominant vegetation types found on the property (Figure 1). In GIS, point count stations were positioned 250 m apart along each transect with the goal of placing 12 stations per transect. Where transects were too short to accommodate 12 stations at the desired spacing, additional stations were placed at each end of the transect until the desired number was reached. Based on aerial photos and the GAP vegetation layer, additional stations were placed to capture vegetation types that were previously under-represented.

### *Field surveys and analysis*

We used a standardized variable radius point count method to estimate abundance of birds during the breeding season (Stephens et al. 2010, Ralph et al. 1993). Point count surveys were conducted during two visits between 23 May and 25 June. Surveys began within 15 minutes of

sunrise and were completed within 4 hours. Each point count survey was completed during a 5-minute period with all birds detected by sight or sound identified to species. Horizontal distance to each bird was estimated to the nearest meter. The time of detection, detection type (e.g., visual, song, call), and breeding status were recorded for each individual. While point count surveys are an excellent technique for rapidly assessing bird diversity and species density with high accuracy, this methodology will not detect every species that may occur at any given location on any given day. Additionally, the point count method may not be as effective at detecting birds that occur at relatively low densities and/or do not vocalize often, such as raptors. Surveyors collected a comprehensive species checklist to account for those species that were encountered during survey visits but not detected during point counts.

Vegetation data were collected during the first visit using standard relevé methodology at point count stations (Stephens et al. 2010, Ralph et al. 1993). The method is designed to describe habitat characteristics associated with the feeding and nesting requirement of birds. Within a circular plot defined by a 50 m radius we recorded total percent cover of the tree layer (all vegetation typically  $\geq 5$  m), shrub layer (all vegetation typically  $\geq 0.5$  m and  $< 5$  m), and ground layer (all vegetation typically  $< 0.5$  m) estimated to the nearest 5%, as well as percent cover for individual tree and shrub species. On the second visit, an additional rapid stand density survey based on the BBIRD protocol (Martin et al. 1997) was conducted to measure finer scale vegetation structure at each station. Woody stems were counted by height and size class at 3 subplots located in fixed compass directions 25 m from the station center.

### *Analysis*

We estimated mean abundance (birds/station) and standard error (SE) for all bird species detected within 75 m based on the maximum count of each species over the course of the two visits. We summarized additional species detected outside of 75 m during point count surveys or accounted for on species checklists. We also noted birds that are identified as focal species for particular vegetation types by Partners in Flight (PIF) conservation plans for Oregon/Washington valleys and lowlands (Altman 2000); Oregon/Washington conifer forests (Altman and Alexander 2012); and California oak woodlands, conifer forests, and riparian forests (CalPIF 2002a, 2002b; RHJV 2004). While habitats of Oregon were the primary focus, we included focal species for California due to the close proximity, similar habitats, and connectivity of bird populations across the two states. Additionally we note Species of Conservation Importance for the Pacific Avifaunal Biome (encompassing the west coast of Canada and the US) in the PIF conservation plan for North American Landbirds (Rich et al. 2004); these are species whose populations are declining, facing critical threats, or are restricted to a relatively small geographic area. Finally, we estimated mean and standard error (SE) of percent cover within major cover types, as well as mean and SE of cover for all tree and shrub species identified during relevé surveys.

## Results

### *Bird community*

In 2015, we detected a total of 54 bird species during point count surveys and on species checklists at the Sampson Creek property. These included a number of species associated with a gradient of grassland, chaparral, oak/deciduous forest, and riparian habitats. Of 45 species detected within 75 m during point count surveys, 14 were focal species for oak woodland, oak chaparral, and valley chaparral habitats; Chipping Sparrow was the most abundant oak or chaparral focal species (Table 1). One additional oak woodland focal species, Western Bluebird, was detected only outside of 75 m during point count surveys or on species checklists (Table 2). Acorn Woodpecker, Oak Titmouse, Western Scrub Jay, Mountain Quail, and Wrentit, all detected within 75 m, are PIF Species of Continental Importance for oak and chaparral habitats of the Pacific Biome. Black-throated Gray Warbler, a Species of Continental Importance for mixed forests but which occurs in oak vegetation types in the Rogue Basin, was also detected within 75 m. Two grassland focal species and two deciduous woodland focal species were detected within 75 m during point counts, as well as three riparian focal species and one open water focal species. The most abundant species was the Black-Headed Grosbeak, a California PIF riparian focal species that is also associated with oak habitat in Oregon (Altman and Stephens 2012). One deciduous woodland and two riparian focal species were detected only outside of 75 m during point count surveys or on species checklists (Table 2).

Another group of focal species representing conifer forests were detected at the Sampson Creek property. Two focal species for mature/old-growth conifer forest, Brown Creeper and Pacific-Slope Flycatcher, were detected within 75 m during point count surveys; both species were relatively uncommon, detected at only one of the 48 point count stations (Table 1). Five focal species for younger conifer forest age classes and three focal species for the unique Southern Oregon mixed forest vegetation type were detected within 75 m during point count surveys (Table 1). From California PIF, an additional five coniferous focal species not covered in Oregon/Washington PIF conservation plans were detected. Steller's Jay and Hermit Warbler which are PIF Species of Continental Importance for conifer forests of the Pacific Biome, and Pacific-slope Flycatcher, a Species of Continental Importance that is associated with mature conifer forest as well as mixed forest, were detected within 75 m. One additional focal species, Pileated Woodpecker, was detected only outside of 75 m during point count surveys or on species checklists (Table 2).

### *Vegetation community*

Overall, mean tree cover was fairly low across all stations sampled at the Sampson Creek property, and was dominated by hardwoods (Table 3). Oregon white oak had the highest mean cover of any tree species, followed by Douglas fir and white fir. Shrub cover was also low; poison oak had the highest cover of any of the six primary shrub species identified, followed by snowberry and mock orange. Mean cover of the ground cover layer was somewhat higher, and dominated by forbs (i.e., non-woody flowering plant species), indicative of prairie and savannah habitats. These results suggest that most survey stations fell within oak woodland, savannah, or prairie habitat, with a few stations occurring in higher elevation conifer forest or riparian zones.

This confirms the plant communities described by the GAP vegetation layer: a mix of prairie, oak, chaparral, conifer, and riparian vegetation types.

## Discussion

Overall, the bird and vegetation communities at the Sampson Creek property suggest a diverse set of habitat types, representative of the overall heterogeneity of the Rogue Basin landscape. The position of the property, straddling the edge of where the oak savannahs and woodlands of the Emigrant Lake area meet the conifer zone of the Cascade Mountains, contributes to the diversity of bird and vegetation species that are supported within the property boundaries. A number of species not detected during point count surveys are also known to use this property; these include American Kestrel, Turkey Vulture, Western Kingbird, and Black-billed Magpie (Evan Frost personnel communication).

All but one bird species detected during point count surveys and on checklists were native, suggesting that overall the native bird community does not face extreme competition from exotic bird species. The Wild Turkey is a common exotic species in Oregon, introduced from the eastern U.S., and is an important competitor with native birds and mammals for acorn resources. The only likely non-breeding bird detected was the Townsend's Warbler. This species tends to be a late migrant in the Rogue Basin, often detected up until late May or early June on its way to its breeding range farther north.

Based on vegetation surveys, the most dominant vegetation types within the survey transects were oak and prairie. GAP data additionally indicates a potentially large component of chaparral shrub habitats. The presence of numerous oak, chaparral, and grassland focal bird species indicates that habitat conditions at the Sampson Creek property are sufficient to support a complex community of bird species that rely on these vegetation types for nesting habitat. In addition to the 13 oak chaparral focal species detected with 75 m during point counts, the four most abundant species – Black-headed Grosbeak, Lazuli Bunting, Western Meadowlark, and Chipping Sparrow - are all considered obligate or highly associated with oak and chaparral vegetation types (Altman and Stephens 2012). These oak, chaparral, and prairie focal species indicate that the property contains habitat that is valuable to birds as well as hundreds of other oak-adapted insect, mammal, reptile, amphibian, and plant species that occur in southern Oregon. Indeed, the Sampson Creek property contains relatively high diversity of bird species that utilize oak habitats. Of 31 oak-associated species noted in the Land Manager's Guide to Bird Habitat and Populations in Oak Ecosystems in the Pacific Northwest (Altman and Stephens 2011), 20 were detected on this property, a very high number given the size of this site.

Oak habitats in the Pacific Biome have the highest percentage of PIF Species of Continental Importance with declining trends as compared with other habitats in this region (Rich et al. 2004); including Oak Titmouse and Wrentit detected at the Sampson Creek property. Over 95% of the populations of each of these species are contained within the Pacific Biome, making oak and chaparral habitat integrity in this region critical to their long-term survival. A large

proportion of the lowland and foothill oak woodland, chaparral, and savannah habitat of the Rogue Basin has been converted to agriculture or development; what remains is threatened due to fire suppression, invasive species, and further land use conversion (Altman and Stephens 2012). Private properties that continue to provide suitable habitat for oak-, chaparral-, and grassland-dependent bird species present an excellent opportunity to increase resilience of local wildlife populations in the Southern Oregon landscape through wildlife-friendly management regimes. Each focal bird species relies on unique attributes of vegetation structure and composition that can be specifically targeted by management practices within various oak types (e.g., oak savannah, oak woodland, oak chaparral) to enhance overall ecosystem function. Practices such as retention of large, old trees; dead and downed trees and limbs; promotion of native shrubs; and balanced grazing can promote habitat structures and conditions that are favorable to support continued use of these vegetation types for oak-associated bird species and other oak-dependent animals and plants (Klamath Bird Observatory and Lomakatsi Restoration Project 2014, Rich et al. 2014).

Several mature to old-growth conifer forest bird species (Brown Creeper, Pacific Slope Flycatcher, and Pileated Woodpecker), as well as a number of focal species for younger age classes of conifer forest, were detected during surveys. Additionally, both Hermit Warbler and Steller's Jay are Species of Conservation Concern for mature coniferous forests of the Pacific Biome. Health of mature conifer forests in this region is important for maintaining Hermit Warbler populations, of which 94% are contained in the Pacific Biome. The presence of these species, as well as the many coniferous tree species identified during vegetation surveys, provides further evidence of the biological value of the Sampson Creek property. After oak and chaparral habitats, mature conifer forests contain the second-highest number of PIF Species of Conservation Concern regionally. Mature forests in particular are at much lower abundance across the Pacific Northwest than they were historically, due primarily to timber harvest. Mature forest-associated bird species indicate that the Sampson Creek property contains good habitat for birds and other species that evolved to utilize the unique vegetation structures (e.g., dead wood, large trees, and multi-layered canopies) within mature conifer stands. Focal species for younger conifer forests suggest there is a good age-class distribution of conifer across the property. Disturbance such as fire naturally replace old trees with young trees, and young coniferous forest also provide important habitat to which many bird and other species are specifically adapted. Healthy young forests also provide the potential to promote mature and old-growth forest characteristics into the future.

Finally, riparian habitat, indicated by tree and shrub species such as cottonwoods, willow, and mock orange, and by bird species such as Black-headed Grosbeak, Tree Swallow, and Wilson's Warbler, documents additional richness of habitat types within the Sampson Creek property. Several additional generalist species detected at the property, specifically Pacific-slope Flycatcher, Western Tanager, Wrentit, and Bullock's Oriole, have an affinity to the deciduous trees present in narrow riparian zones, and thus serve as good indicators of this important broad-leaf habitat component. Riparian habitats are particular biodiverse areas, especially in summer when water is in short supply throughout the rest of the southern Oregon landscape.

Riparian zones generally supply more vegetative growth throughout the hottest times of the year, leading to increased populations of arthropods that are critical for insectivorous bird species. Moisture-loving amphibians use riparian areas as a critical summer refuge, and many plant species can only be found in these moist forests.

Although two transects were placed to follow streams (SA01 alongside Cattle Creek and an unnamed stream, and SA04 alongside Sampson Creek), they likely represent different types of riparian habitat. Six of SA04's eleven stream-side points, but only one of SA01's nine stream-side points, contained greater than 5% riparian-type vegetation. For both transects, many of these points had flowing water in late May. Intermittent and perennial streams with narrow riparian vegetation in oak and mixed conifer forests would not be expected to support birds that are riparian obligates if the patch size of suitable vegetation is too small to support breeding territories. Drier-site riparian habitats may thus not contain all of the bird species expected to be present in riparian areas generally, but do provide a very important broadleaf habitat component within mixed forests.

## **Conclusion**

Continued monitoring of the Sampson Creek property will help inform decisions about future management activities and land use planning on this parcel and elsewhere. Data from this project contributes to Klamath Bird Observatory's extensive bird and vegetation datasets focused largely in the Klamath-Siskiyou Bioregion of southern Oregon and northern California and available through Avian Knowledge Northwest ([www.avianknowledgenorthwest.net](http://www.avianknowledgenorthwest.net)). The Sampson Creek data add to information from a growing number of sites containing oak, mature conifer, and riparian vegetation which will be valuable for further research regarding bird species dependent on the continued function of these habitats within the Rogue Basin.

## **Acknowledgements**

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**Tables**

**Table 1.** Mean abundance (birds/station from maximum count of each species during two survey visits) and standard error (SE), in decreasing order of abundance including only detections within 75 m during 2015 point count surveys at the Sampson Creek property, focal species status [Oregon/Washington (OR/WA), California (Cal)], and conservation status [North American (NA) Partners in Flight (PIF)]. A mean abundance and SE value of 0.021 indicates that a species was detected within 75 m of only one of the 48 point count stations. Species marked with an asterisk are non-native. Note: Only one OR/WA PIF Valleys and Lowlands Riparian species was detected (Tree Swallow).

Species	Mean	SE	OR/WA PIF - Valleys and Lowlands <sup>1</sup>					OR/WA PIF - Coniferous Forests <sup>2</sup>			Cal PIF <sup>3</sup>			NA PIF <sup>4</sup>
			Oak Woodland	Oak Chaparral	Valley Chaparral	Grassland	Deciduous Woodland	Old-growth & Mature Conifer	Sapling to Mature Conifer	Southwest OR Mixed Forest	Oak Woodland	Coniferous	Riparian	Pacific
Black-Headed Grosbeak	0.729	0.114										X		
Lazuli Bunting	0.604	0.118												
Western Meadowlark	0.583	0.133			X									
Chipping Sparrow	0.458	0.107	X								X			
California Quail	0.438	0.103							X					
Dark-Eyed Junco	0.333	0.096												
Spotted Towhee	0.333	0.075												
Steller's Jay	0.313	0.080								X			X	
Western Tanager	0.271	0.093							X	X				
American Robin	0.229	0.068												
Hermit Warbler	0.208	0.084						X					X	
Mourning Dove	0.188	0.057												
Northern Flicker	0.188	0.057						X						

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Species	Mean	SE	OR/WA PIF - Valleys and Lowlands <sup>1</sup>					OR/WA PIF - Coniferous Forests <sup>2</sup>			Cal PIF <sup>3</sup>			NA PIF <sup>4</sup>	
			Oak Woodland	Oak Chaparral	Valley Chaparral	Grassland	Deciduous Woodland	Old-growth & Mature Conifer	Sapling to Mature Conifer	Southwest OR Mixed Forest	Oak Woodland	Coniferous	Riparian	Pacific	
Black-capped Chickadee	0.167	0.054		X											
Oak Titmouse	0.167	0.069		X							X				X
Red-Breasted Nuthatch	0.167	0.062										X			
Western Wood-pewee	0.167	0.075	X												
White-Breasted Nuthatch	0.146	0.059	X								X				
Western Scrub Jay	0.125	0.057									X				X
Acorn Woodpecker	0.104	0.045	X								X				
Blue-Gray Gnatcatcher	0.104	0.045													
American Crow	0.083	0.050													
Bullock's Oriole	0.083	0.065					X								
Cassin's Vireo	0.083	0.050													
Hermit Thrush	0.083	0.058								X					
Lark Sparrow	0.083	0.058				X					X				
Mountain Chickadee	0.083	0.050													
Black-Throated Gray Warbler	0.063	0.035							X						X
Common Raven	0.063	0.035													
McGillivray's Warbler	0.063	0.046										X			
Tree Swallow	0.063	0.063											X		
Wrentit	0.063	0.046		X			X								X
Lesser Goldfinch	0.042	0.029		X											

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Species	Mean	SE	OR/WA PIF - Valleys and Lowlands <sup>1</sup>					OR/WA PIF - Coniferous Forests <sup>2</sup>			Cal PIF <sup>3</sup>			NA PIF <sup>4</sup>
			Oak Woodland	Oak Chaparral	Valley Chaparral	Grassland	Deciduous Woodland	Old-growth & Mature Conifer	Sapling to Mature Conifer	Southwest OR Mixed Forest	Oak Woodland	Coniferous	Riparian	Pacific
Nashville Warbler	0.042	0.029	X		X				X					
Townsend's Warbler	0.042	0.029												
Wilson's Warbler	0.042	0.029						X				X		
Ash-Throated Flycatcher	0.021	0.021	X							X				
Brewer's Blackbird	0.021	0.021												
Brown Creeper	0.021	0.021					X				X			
Bushtit	0.021	0.021												
Dusky Flycatcher	0.021	0.021												
Mountain Quail	0.021	0.021									X		X	
Pine Siskin	0.021	0.021												
Pacific-Slope Flycatcher	0.021	0.021					X						X	
Purple Finch	0.021	0.021						X			X			
Ruffed Grouse	0.021	0.021												
Wild Turkey*	0.021	0.021												

<sup>1</sup>Altman 2000, <sup>2</sup>Altman and Alexander 2012, <sup>3</sup>CalPIF 2002, <sup>4</sup>Rich et al. 2004

**Table 2.** List of additional species detected at Sampson Creek property in 2015 at point count surveys and/or species checklists (i.e., not counted within 75 m during point count surveys) and conservation status [Oregon/Washington (OR/WA), California (Cal), North American (NA) Partners in Flight (PIF) focal and conservation species].

Species	OR/WA PIF <sup>1, 2</sup>		Cal PIF <sup>3</sup>			NA PIF <sup>4</sup>
	Valleys and Lowlands: Deciduous Woodland	Coniferous Forests: Old- growth & Mature Conifer	Oak Woodland	Coniferous	Riparian	Pacific
House Finch						
Pileated Woodpecker		X		X		
Red-Breasted Sapsucker						X
Red-Tailed Hawk						
Swainson's Thrush	X				X	
Warbling Vireo					X	
Western Bluebird			X			

<sup>1</sup>Altman 2000, <sup>2</sup>Altman and Alexander 2012, <sup>3</sup>CalPIF 2002, <sup>4</sup>Rich et al. 2004

**Table 3.** Mean percent cover with standard error (SE) of major vegetation cover types, woody plant species, and forb and grass species combined, identified during relevé surveys at the Sampson Creek property in 2015.

<b>% Cover</b>	<b>Mean</b>	<b>SE</b>
Total Tree	25.625	2.166
Total Conifer	7.924	1.947
Total Hardwoods	15.324	1.862
Big-leaf maple	1.376	0.439
Black cottonwood	0.021	0.021
Douglas fir	4.377	1.130
Incense cedar	1.272	0.566
Mountain alder	0.854	0.343
Oregon ash	0.626	0.353
Oregon white oak	13.563	1.752
Pacific madrone	0.002	0.001
Ponderosa pine	1.024	0.436
White alder	0.210	0.208
White fir	2.105	0.865
Willow species	1.482	0.514
Total Shrub	14.557	2.066
Mock orange	1.146	0.686
Oregon grape	1.044	0.420
Poison oak	3.522	0.995
Rose species	0.126	0.106
Snowberry species	1.460	1.020
Unknown shrub species	0.626	0.625
Total Ground Cover	37.661	3.047
Forb species	26.689	0.374
Grass species	10.401	0.437

## Figures

**Figure 1.** Bird and vegetation monitoring station locations established and surveyed in 2015 at the Sampson Creek property by the Klamath Bird Observatory. Stations were divided into four routes (SA01, SA02, SA03, and SA04), each surveyed on separate days over the course of two visits during May and June.

