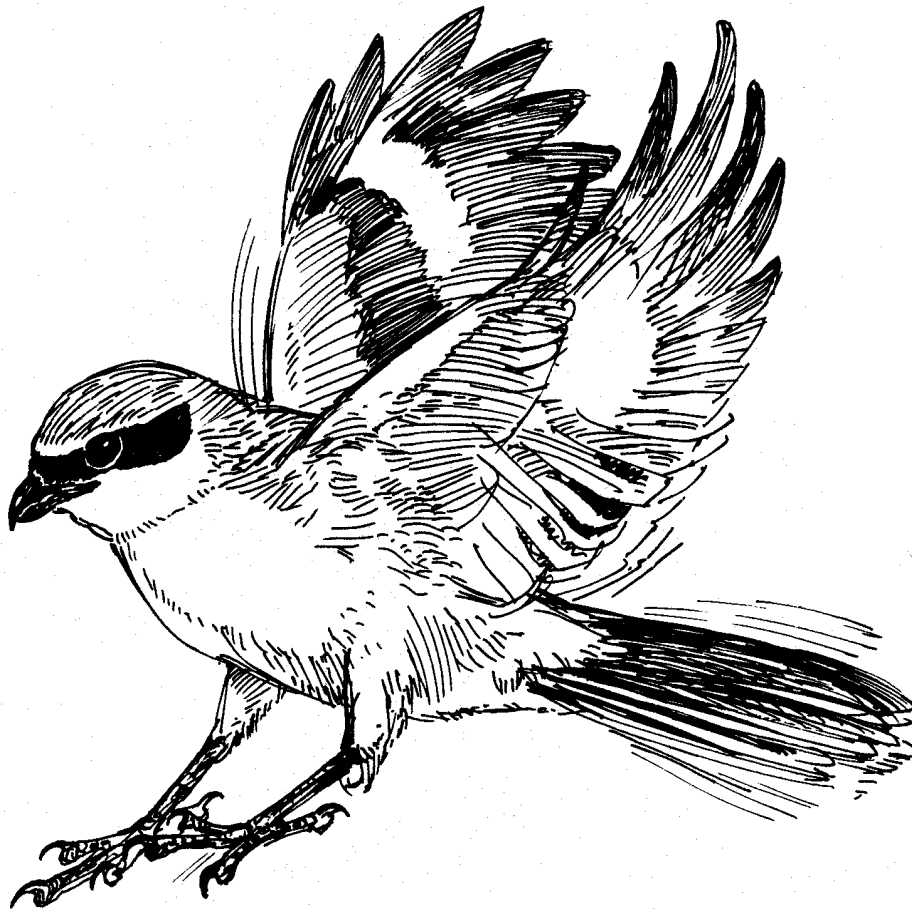


Craters of the Moon National Monument
1998 Annual Breeding Bird Survey



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Executive Summary

Bird surveys were run on five point count transects during June and July of 1998. The surveys were performed on routes that were established and first surveyed in 1997. These five routes covered varying amounts of 18 of the 27 habitat types recognized at Craters of the Moon by Day and Wright(1985). There were a total of 569 individuals of 45 species observed on 66 point counts. The most numerous birds were Brewer's Sparrow, Spotted Towhee, Mountain Bluebird, Rock Wren, Clark's Nutcracker, and Sage Thrasher. All other species had less than 25 total observations. The American Kestrel, Mourning Dove, Northern Flicker, Rock Wren, Violet-green Swallow, Sage Thrasher, Western Tanager, Green-tailed Towhee, Spotted Towhee, Vesper Sparrow, Chipping Sparrow, and Brewer's Sparrow were all recorded on 4 or 5 of the transects.

Over a third of the species recorded are listed as sensitive by the state of Idaho, the BLM on adjacent lands, or are a Partners in Flight priority species. Sixteen of these are either shrub steppe or riparian associates indicating that Craters of the Moon continues to be a significant sanctuary for these habitats on the upper Snake River Basin.

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Craters of the Moon National Monument

1998 Annual Breeding Bird Survey

INTRODUCTION

Monitoring of bird species began at Craters of the Moon National Monument (CRMO) in 1988 with the implementation of an annual bird survey, consisting of 34 sites located in 17 of the 26 vegetation types described in the monument (Day and Wright, 1985). This survey required an extensive effort in skilled staff and days in the field. Sites were widely dispersed and many required extensive travel by foot to reach, making it impossible to complete more than 2 sites a day by one individual. This survey was established primarily to measure habitat quality, using avian species diversity as an indicator.

The CRMO bird survey was revised prior to the 1997 field season. It was the purpose of the revised survey to make the bird species the focus of the study. The health of the habitat would come second with the implementation of the MAPS (Monitoring Avian Productivity and Survival) mist-netting program in the future. The MAPS program was designed to monitor productivity, survival, and recruitment which are key indicators of habitat quality.

METHODS

The bird survey for CRMO was based on the nationally accepted bird survey protocols defined by the United States Geological Survey's Biological Resources Division's Breeding Bird Survey (BBS) (USGS 1998). The standard BBS protocol is a road based point count survey. This protocol had to be modified since a 25 mile driving route does not exist in the monument. Shorter routes were selected and include primary trails which are surveyed on foot. The loop road is surveyed by vehicle, but is only 4.7 miles in length from the VC to the point where the one-way loop ends (spur roads not included in survey).

The CRMO survey's Standard Operating Procedures (SOP's) recommend beginning the survey in mid-May after the arrival of the Brewer's Sparrow, and completing it by the end of June. In 1998 the late spring/early summer season was wet and cool compared to the average (Appendix 1), delaying the arrival of a number of species of birds by approximately 2 to 3 weeks. Many long distance migrants were not observed on the monument until mid June. As a result, the surveys did not begin until 06/15/98 and ended 07/01/98.

The survey consists of five routes (maps attached):

- 1 - LOOP DRIVE, starts at the stop sign where the residential road joins the loop road at the east end of the visitor

center parking lot, and ends where the one-way loop ends.

- 2 - TREE MOLDS TRAIL, starts at the sign at the head of the trail.
- 3 - WILDERNESS TRAIL, starts at the sign at the head of the Broken Top/Wilderness trail.
- 4 - CAREY KIPUKA, starts at the north stake of the vegetation monitoring transect, circling the kipuka half way between the top of the kipuka and the edge of the lava flows in a counter-clockwise direction.
- 5 - NORTH END ROAD, starts where Goodale's Cut-off separates Little Cottonwood road and follows the little Cottonwood Creek past Martin Mine to the end of the road near the top of the drainage.

All surveys were conducted under acceptable environmental conditions as described in the BBS survey protocol (USGS 1998). Surveys begin 1/2 hour before sunrise. A measuring wheel is used to measure the distance between station stops on the walking routes at 250 meter intervals (825 feet). The odometer in the vehicle is used to measure the distance between station stops on the loop road at 500 meter (.31/mile) intervals.

The survey begins upon arrival to each station and lasts five minutes. A second individual was present to help keep time and record data, however, only the surveyor's observations were recorded. All birds heard or observed were recorded during each station stop. Birds detected were categorized as either over or under 50 meters or as flyovers (birds which were flying over at higher altitudes and likely not directly influenced by the immediate vegetative structures). Observations were further subdivided into those recorded in the first 3 minutes and 3 to 5 minutes. Birds flushed while in route between stations were also counted. All transects were completed within 3.5 hours. When an individual bird was observed from nearby points it was counted at the first location only.

The vegetation types (Appendix 2) for each station were identified and recorded on the field form, using the Vegetation Types Map for reference.

RESULTS

A total of 22,250 meters were surveyed, consisting of 66 station stops, as listed in Table 1. The total number of individuals was 569 with the greatest number (230) on the wilderness trail and least (53) on the Carey Kipuka route (Table 1). The mean number of birds per stop ranged from 5.3 to 10.9 with a mean of 8.6. The number of species per transect ranged from 13 at Carey Kipuka to 32 at the North End. The total number of species observed on all transects was 45. The mean number of species at each stop ranged from 4.0 to 5.3 with an average

for all sites of 4.8.

The Brewer's Sparrow had the greatest number (149) of individuals recorded. They accounted for 26% of all individuals recorded. Other species with total counts over 25 included Spotted Towhee (n = 77, percent of total = 13.2), Mountain Bluebird (n = 40, % = 6.9), Rock Wren (n = 38, % = 6.7), Clark's Nutcracker (n = 29, % = 5), and Sage Thrasher (n = 29, % = 5) (Table 2).

The Northern Flicker, Rock Wren, and Brewer's Sparrow were found on all five transects. American Kestrel, Mourning Dove, Violet-green Swallow, Sage Thrasher, Green-tailed Towhee, Spotted Towhee, Vesper Sparrow, Chipping Sparrow, and Western Tanager were recorded on four of the five transects. Four species were recorded on 20 or more points. These were Brewer's Sparrow at 48 points (73% of total), Spotted Towhee at 44 points (67% of total), Rock Wren 24 points (36% of total), and Mountain Bluebirds were recorded at 23 points (35% of total).

Several species such as Sage Thrasher, Sage Sparrow, Brewer's Sparrow, and Loggerhead Shrike were found only in shrubsteppe areas and in cinder gardens which contained shrub layers (Table 3). Other species such as the Spotted Towhee, American Robin, Mountain Bluebird were found in a much broader spectrum of habitats. The Northern Flicker and Clark's Nutcracker which are considered forest birds while not always recorded at sites categorized as forest but were always observed in the immediate vicinity of trees if only isolated pines within the lava flows.

Of all vegetation types lava flows were surveyed on the highest percentage of points (45% of points surveyed some lava flows) (Table 4). Other vegetation types that were surveyed on more than 10 percent of the points were Cinder Gardens (36%), antelope bitterbrush (32%), and Limber Pine/Bitterbrush (32%). Although no single type of sagebrush community was monitored on more than ten percent of points this general category consists of 12 different types and collectively accounted for the highest percentage of points. Of the more general communities types Lavas (flows and cinders) were monitored on 50% of points, shrubsteppe on 68.2%, grasslands on 4.5%, forests on 42.4%, and the developments on 1.5% of points.

Table 1. Craters of the Moon National Monument's 1998 Breeding Bird Survey general route summary

ROUTE	LENGTH (m)	# of stops	habitat types	# of indv. (N)	avg. birds per point	# of species per transect	avg. species per point
Walking Routes							
Wilderness Trail	5500	22	1,2,6,7, 16,21,22	231	10.9	22	5.1
Tree Molds	3000	8	2,16,22	69	8.6	14	4.8
Carey Kipuka	2500	10	2,8,9,11	53	5.3	13	4.0
North end Road	3750	11	4,5,7,18, 20,24,25, 26	101	9.1	33	5.3
Driving Route							
Loop Drive	7500	15	1,2,4,16, 21,22,27	117	4.8	20	4.7
TOTALS	22250	66		569	4.8	45	4.8

For habitat codes see Appendix 2.

Table 2. Species recorded during 1998 Breeding Bird Survey

Species	No. of birds	% of total	Rts. detected on	# of stops	% of stops
Golden Eagle	1	0.1	NE	1	1.5
Northern Harrier	1	0.1	NE	1	1.5
American Kestrel	6	1.1	NE,LP,TM,WT	6	9.1
Blue Grouse	1	0.1	NE	1	1.5
Gray Partridge	1	0.1	CK	1	1.5
Mourning Dove	24	4.2	NE,TM,CK,WT	19	28.8
Common Poorwill	1	0.1	TM	1	1.5
Common Nighthawk	3	0.5	CK	2	3
Rufus Hummingbird	3	0.5	WT	3	4.5
Lewis Woodpecker	1	0.1	WT	*	*
Northern Flicker	15	2.5	NE,LP,TM,CK,WT	14	21.2
Olive-sided Flycatcher	1	0.1	WT	1	1.5
Say's Phoebe	5	0.7	LP,TM,WT	4	6.1
Dusky Flycatcher	3	0.5	NE	2	3
Horned Lark	3	0.5	NE,CK	3	4.5
Violet-green Swallow	10	1.7	NE,LP,CK,WT	6	9.1
Clark's Nutcracker	29	5.1	LP,WT	15	22.7
Black-billed Magpie	2	0.3	NE	1	1.5
Common Raven	5	0.8	WT,LP	4	6.1
Black-capped Chickadee	4	0.7	NE,LP	3	4.5
House Wren	2	0.3	NE	2	3
Rock Wren	38	6.7	NE,LP,TM,CK,WT	24	36
Mountain Bluebird	40	6.9	LP,TM,WT	23	34.8
American Robin	6	1.1	NE,LP,WT	5	7.6
Loggerhead Shrike	4	0.7	CK	3	4.5
Sage Thrasher	29	5	NE,TM,CK,WT	19	28.8
Warbling Vireo	5	0.8	NE	2	3
Yellow Warbler	5	0.8	NE	4	6.1
MacGillivray's Warbler	2	0.3	NE	2	3
Lazuli Bunting	10	1.7	NE	5	7.6
Green-tailed Towhee	6	1.1	NE,LP,TM,WT	6	9.1
Spotted Towhee	77	13.2	NE,LP,TM,WT	44	67
Vesper Sparrow	4	0.7	NE,LP,CK,WT	4	6.1

* Lewis Woodpecker seen flying on walk out shortly after last point

Table 2. Species recorded during 1998 Breeding Bird Survey

Species	No. of birds	% of total	Rts. detected on	# of stops	% of stops
Song Sparrow	5	0.5	NE	3	4.5
Chipping Sparrow	16	2.8	NE,LP,TM,WT	12	18
Brewer's Sparrow	149	26	NE,LP,TM,CK,WT	48	73
Fox Sparrow	1	0.1	NE	1	1.5
Sage Sparrow	3	0.5	NE,TM	3	4.5
Western Meadowlark	19	3.3	CK	10	15.2
Brewer's Blackbird	2	0.3	NE,LP	2	3
Brown-headed Cowbird	4	0.7	NE,CK,WT	4	6.1
Western Tanager	8	1.4	NE,LP,TM,WT	5	7.6
Pine Siskin	5	0.8	NE	1	1.5
Cassin's Finch	1	0.1	LP	1	1.5
House Sparrow	2	0.3	LP	1	1.5

Route ID codes: NE = North End Road LP = Loop Road TM = Tree
Molds Trail CK = Carey Kipuka WT = Wilderness Trail

Table 3 Species list recorded by vegetation type

VEGETATION TYPE		LAVAS		SHRUB-STEPPE COMMUNITIES								FORESTED					
SPECIES	STATUS	1	2	3	4	6	7	8	9	11	16	20	21	22	24	25	26
Golden Eagle	P				X												
Northern Harrier	B				X												
American Kestrel				X	X					X		X	X				
Blue Grouse	P			X													
Gray Partridge									X								
Mourning Dove			X	X	X		X		X	X			X				
Common Poorwill			X														
Common Nighthawk			X						X								
Rufous Hummingbird	P,B	X			X					X							
Lewis' Woodpecker	P,B												X				
Northern Flicker		X	X		X				X	X		X	X		X		
Olive-sided Flycatcher	P												X				
Say's Phoebe										X		X	X				
Dusky Flycatcher	B															X	
Horned Lark				X			X	X									
Violet-green Swallow		X	X						X	X		X	X			X	
Clark's Nutcracker		X			X					X		X	X				
Black-billed Magpie				X											X		
Common Raven			X							X		X	X				
Black-capped Chickadee												X	X		X		
House Wren																X	
Rock Wren	P	X	X	X	X					X							
Mountain Bluebird		X	X	X	X					X		X	X				
American Robin				X						X			X	X			X

Status column codes: P = Idaho Partners in Flight priority species recommendation

I = Idaho Department of Fish and Game species of special concern

B = US Bureau of Land Management sensitive species

For vegetation codes see appendix 2

Table 3 Species list recorded by vegetation type cont.

VEGETATION TYPE		LAVAS			SHRUB-STEPPE COMMUNITIES								FORESTED					OTHER
SPECIES	STATUS	1	2	3	4	6	7	8	9	11	16	20	21	22	24	25	26	27
Loggerhead Shrike	P,I						X	X	X									
Sage Thrasher	P	X			X	X		X	X		X							
Warbling Vireo																	X	
Yellow Warbler	P,B														X	X	X	
MacGillivray's Warbler	P,B																X	
Lazuli Bunting					X												X	
Green-tailed Towhee	B		X		X	X					X							
Spotted Towhee		X			X	X					X		X	X			X	X
Vesper Sparrow		X			X					X				X				
Song Sparrow																	X	
Chipping Sparrow						X					X			X	X	X	X	
Brewer's Sparrow	P,B	X			X	X	X	X	X		X							
Fox Sparrow																	X	
Sage Sparrow	P,B				X						X							
Western Meadowlark	P							X	X	X								
Brewer's Blackbird					X								X	X				
Brown-headed Cowbird						X		X									X	
Western Tanager	P	X									X			X	X			
Pine Siskin															X			
Cassin's Finch																		X
House Sparrow																		X

Status column codes: P = Idaho Partners in Flight priority species recommendation

I = Idaho Department of Fish and Game species of special concern

B = US Bureau of Land Management sensitive species

For vegetation codes see appendix 2

Table 4. Vegetation types included on the Craters of the Moon Breeding Bird Survey routes.

Vegetation Types	Number of Stops per route						% of stops
	LP	TM	WT	CK	NE	Ttl	
Lavas						33	50.0
1	10	-	14	-	-	24	36.4
2	9	5	6	10	-	30	45.5
Sagebrush						45	68.2
4	2	-	-	-	8	10	15.2
5	-	-	-	-	1	1	1.5
6	-	-	6	-	-	6	9.1
7	-	-	1	-	1	2	3.0
8	-	-	-	10	-	10	15.2
9	-	-	-	10	-	10	15.2
11	-	-	-	10	-	10	18.2
16	2	5	13	-	-	21	31.8
Grasses						3	4.5
18	-	-	-	-	2	2	3.0
20	-	-	-	-	1	1	1.5
Forests						28	42.4
21	2	-	-	-	-	2	3.0
22	8	7	6	-	-	21	31.8
24	-	-	-	-	2	2	3.0
25	-	-	-	-	3	3	4.5
26	-	-	-	-	5	5	7.6
Developed						1	1.5
27	1	-	-	-	-	1	1.5

LP = Loop Road CK = Carey Kipuka WT = Wilderness Trail
NE = North End Rd TM = Tree Molds Trail

Note - The total number of stops on each trail totaled 66, and that is the number used above to figure % of stops. However, the total number of stops in the vegetation types listed above is greater due to the multiple vegetation types present at a number of the stops.

CONCLUSION

The total number of birds observed in 1998 was 70% higher than 1997 and the number of species showed a 50% increase. This was only the second year of monitoring on these routes so it is difficult to interpret these numbers in terms of any trends that may or may not be present. However, one situation that likely had some affect on bird numbers is that the prevailing weather conditions were very different in the winter and spring 96-97 versus 97-98 (Appendix 1). Temperatures and precipitation levels were below normal during the spring of 1997. Conversely the temperatures were close to the 40 year average throughout winter and spring of 97-98 but precipitation was well below normal in early winter rising to more twice the average amount in May and June. These conditions may have led to very different vegetative conditions during the breeding season for many species. These weather patterns were likely in part responsible for a delay in the arrival of many long distance migrants.

None of the 45 bird species observed during the 1998 surveys is on either the federal or state endangered species lists. However, of these 45 species, 17 of the species have been recommended for priority status by Idaho Partner's in Flight (IDPIF 1998), are listed by the Idaho Department of Fish and Game (IDFG 1998) as species of special concern, or as sensitive by the US Bureau of Land Management (USBLM 1998) on lands adjacent to the monument.

In this portion of their range all but one of these 17 are associated with either shrub steppe or riparian areas. Three of the five most numerous bird species are in one or more of these sensitive categories. This includes the most numerous bird on the monument the Brewer's Sparrow. Most of these species have experienced substantial declines in either part or all of their range including the Snake River Plain. In Idaho much of this has been the result conversion of lands dominated by sagebrush to agriculture and grazing. Basin Big Sagebrush is the dominant shrub on the monument (Day and Wright 1985) and 99% of this shrub's range on the Snake River Plain has been converted to agriculture (Hironaka et al 1983). Furthermore, nearly all of the habitats on the Snake River have been invaded by exotic annual vegetation, primarily cheatgrass. Sagebrush sites that have high cheatgrass component in the understory have experienced an increase in fire frequency from 20-100 years to as little as 3-5 years (Peters and Bunting 1994). This change in the fire frequency has resulted in large areas devoid of native shrubs (Whisenant 1990). This trend is expected to continue in many areas which will make undeveloped areas such as Craters of the Moon of even greater importance to migratory and breeding birds. Approximately 20% of the monument is shrubsteppe vegetation (Day and Wright 1985) and the unique mix of sagebrush and recent lava flows exists in only two other locations in the United States (the area in and around Newberry Crater National Volcanic Monument in central Oregon and Lava Beds National Monument in Northern California).

Craters of the Moon National Monument was set aside to protect unique geologic features of the Great Rift volcanic system. The monument has also preserved a unique ecosystem and provided an important refuge for sagebrush associated flora and fauna of the western United States. In light of this importance as an ecological sanctuary it is important that avian monitoring continue. If we are to maintain natural faunal communities it is important that we know what species are here and their relative abundance. This type of information can be gathered using the point count techniques of the breeding bird survey. To maintain healthy populations we also need to know information regarding distribution, productivity, survival, recruitment and other individual and population characteristics. This type of information is not readily available from point counts and needs to be gathered using other techniques. The Monitoring Avian Productivity and Survival (MAPS) program is designed to answer these types of questions about bird populations. The National Park Service is a cooperator in this joint effort and the information gathered from participation in this program has the potential to produce much useful information for the management of the avian component of the wildlife resources at Craters of the Moon.

The Breeding Bird Survey protocol requires that routes be run in different directions or started in different locations in different years in order to reduce bias toward species that are more active during certain times in the morning. For example, are American Robins more prevalent in the developed area or are they simply recorded there more because they sing early and the route always starts at the visitor center parking lot? It is recommended that before the routes are surveyed in 1999 both a starting point and an ending point be identified and marked so that the surveys may be run in the opposite direction. Working the loop road route backwards may not be feasible in the section that is one way. Therefore, starting in the middle at a predetermined and easily identifiable point such as an intersection is recommended.

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Appendix 1.

Precipitation (inches) and average monthly temperature values (degrees Fahrenheit) at Craters of the Moon National Monument for the 1996-1997 winter and spring seasons compared to the 39 year average. Taken from Craters of the Moon National Monument NOAA Weather Records Database. A 39 year average is used because weather records were first kept starting December of 1958

Precipitation (Inches)

	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
39 yr ave	1.47	1.93	2.07	1.54	1.35	1.04	1.69	1.34
96-97	2.33	4.25	2.12	.02	.02	.66	.35	1.46
97-98	0.82	0.53	2.57	2.71	1.42	1.31	3.49	3.30

Temperature (Fahrenheit)

	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
39 yr ave	30.2	20.8	19.3	24.0	31.0	40.9	50.7	59.5
96-97	34.1	21.6	20.3	24.9	34.6	38.8	56.3	60.9
97-98	31.6	19.8	24.5	24.7	29.2	40.4	47.7	53.4

Appendix 2.

Craters of the Moon National Monument
Vegetation Types

LAVAS

- 1 **Cinder Gardens**
- 2 **Low Vegetation Density Lava Flows**
- 3 Medium Vegetation Density Lava Flows

SAGEBRUSH COMMUNITIES

- 4 **Mountain Big Sagebrush/Bluebunch Wheatgrass**
- 5 **Mountain Big Sagebrush/Sandberg Bluegrass**
- 6 **Mountain Big Sagebrush/Needlegrass**
- 7 **Mountain Big Sagebrush/Needle-and-thread/Cheatgrass**
- 8 **Mountain Big Sagebrush/Idaho Fescue**
- 9 **Big Sagebrush/Cheatgrass**
- 10 Complex of 4 and 8
- 11 **Three-tip Sagebrush/Idaho Fescue**
- 12 Early Low Sagebrush/Idaho Fescue
- 13 Low Sagebrush/Sandberg Bluegrass
- 14 Low Sagebrush/Idaho Fescue
- 15 Complex of 13 and 14

OTHER SHRUB COMMUNITIES

- 16 **Antelope Bitterbrush**
- 17 Antelope Bitterbrush/Great Basin Wildrye

GRASSLANDS

- 18 **Bluebunch Wheatgrass/Idaho Fescue**
- 19 Bluebunch Wheatgrass/Sandberg Bluegrass
- 20 **Great Basin Wildrye**

FOREST COMMUNITIES

- 21 **Limber Pine/Bitterbrush (low total cover)**
- 22 **Limber Pine/Bitterbrush (high total cover)**
- 23 Limber Pine/Bitterbrush (high density Limber Pine)
- 24 **Douglas-fir/Mountain Snowberry**
- 25 **Upland Quaking Aspen**
- 26 **Riparian**

DEVELOPED AREAS

- 27 **Visitor Center and Residences**

Bold = Vegetation types present in the BBS routes