

2015 Spatially-balanced landbird surveys within the Craters of the Moon National Monument and Preserve



Lava flows, grassland, and shrubsteppe in the Craters of the Moon National Monument and Preserve - photo by Heidi Ware

2015 Annual Report

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ABSTRACT: The Intermountain Bird Observatory conducted spatially-balanced landbird surveys across the Craters of the Moon National Monument and Preserve in south-central Idaho between 24 May and 17 June, 2015. Specifically, we conducted surveys at 28, 1km-x-1km grids. We distributed effort such that 23 grids were placed in areas not dominated by lava flows and 5 grids were in lava flows. We followed the spatially-balanced sampling design and the survey protocol of the Integrated Monitoring of Bird Conservation Regions program (through the Bird Conservancy of the Rockies, BCR, formerly Rocky Mountain Bird Observatory) such that our data are comparable to data collected throughout the region. We detected a total 4,397 individuals of 55 different species on counts during the 2015 breeding season. The 10 most frequently detected species were: Western Meadowlark (n = 1152), Horned Lark (973), Brewer's Sparrow (724), Rock Wren (230), Grasshopper Sparrow (214), Common Raven (192), Mourning Dove (156), Sage Thrasher (135), Vesper Sparrow (123), and Brown-headed Cowbird (84). We detected 12 species listed by the BLM and/or IDFG as species of concern during 2015 surveys, including Black-throated Sparrow, Brewer's Sparrow, Burrowing Owl, Ferruginous Hawk, Grasshopper Sparrow, Greater Sage-grouse, Green-tailed Towhee, Loggerhead Shrike, Long-billed Curlew, Sage Thrasher, Sagebrush Sparrow, and Short-eared Owl.



Lava Flows in the CRMO – photo by Heidi Ware

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INTRODUCTION

The Craters of the Moon National Monument and Preserve (CRMO) is located in south-central Idaho and contains a vast extent and impressive diversity of lava flows as well as adjacent habitats composed primarily of shrubsteppe and/or grassy rangeland (USDI-NPS/BLM 2007). The CRMO and the Shoshone Field Office of Bureau of Land Management (BLM) are looking to improve the natural resource dataset across the full extent of the monument and preserve. To gain a better understanding of the distribution and abundance of breeding birds within CRMO, we conducted surveys at 28, 1km-x-1km survey grids during the 2015 breeding season (following previous surveys of 15 grids in 2012 and 30 grids in 2011). We distributed effort such that 23 grids were placed in areas not dominated by lava flows and 5 grids were in lava flows. We followed the spatially-balanced sampling design and the survey protocol of the Integrated Monitoring of Bird Conservation Regions program (IMBCR; RMBO 2015) such that data are comparable to data collected across the region.

METHODS

After discussion with BLM Shoshone Field Office personnel prior to the 2011 field season, we developed two strata within which to conduct bird surveys: “lava” and “non-lava”. We decided to distribute effort such that 80% of effort was focused on the more accessible habitats (primarily shrubsteppe and/or grassland) that occur away from the lava flows (non-lava) and 20% of effort in lava flow areas (lava). This follows an 80%:20% ratio used by the IMBCR program in distributing 80% of effort to more accessible “front-country” areas and 20% of effort to the harder to access “back-country” areas.

Methods that follow are drawn extensively from White et al. (2012), with author permission. We used generalized random-tessellation stratification (GRTS), a spatially-balanced sampling algorithm, to select sample units (Stevens and Olsen 2004). White et al. (2012) point out that the GRTS design is well-suited to long-term monitoring of birds. Importantly, all sample units in the sampling frame are ordered, such that any set of consecutively numbered units is a spatially well-balanced sample (Stevens and Olsen 2004). The GRTS design is also robust to fluctuating budgets in that it’s possible to adjust the sampling effort among years within each stratum while still preserving a random, spatially-balanced sampling design (White et al. 2012).

The study design defined sampling units as 1-km² cells that were used to create a uniform grid over the entire study area. Within each 1-km² grid cell we established a grid of 16 survey points spaced 250 m apart. In 2015, we were able to build on the effort of 2011 and conduct surveys at 28 grids (Figure 1). We used GRTS sampling to create an ordered list for both the lava and non-lava strata and allocated effort such that 23 grids were placed in non-lava areas and five grids were in lava flows. Most non-lava grids were accessed relatively easily using existing roads and 2-tracks, although several occurred in areas of especially rocky roads (requiring high clearance and 4WD) and/or areas that turned very muddy and slick after rain. Thus, we were able to access non-lava grids 1-14, 16-17, 19-23, and 26-27 (Figure 1). This is slightly different than the effort in previous years, but relentless rainy weather in late May and very muddy roads were constraining factors in 2015. In the case of lava flows, some potential grid sites occur quite far from roads and access rules were pre-determined during consultation with BLM Shoshone Field Office personnel. It was determined that if a lava sample unit selected to be surveyed occurred more than 3 miles (5 km) from an accessible road and/or behind private property for which access could not be granted, we would move to the next ordered sample. Thus, we surveyed lava grid numbers 2, 5, 7, 8, and 10 (Figure 1). We surveyed each grid once between May 24 and June 17, 2015. Of note, 27 of the grids were surveyed between 24 May and 31 May, and the 28th grid was surveyed on 17 June (NL17).

Field technicians conducted point counts (Buckland et al. 2001) following the protocol established by the Bird Conservancy of the Rockies (Hanni et al. 2009). Observers surveyed the transects in the morning, beginning 15 minutes before sunrise and concluding their survey no later than 1030 or when bird activity had significantly decreased. The survey duration at each point was six minutes because an even number of minute intervals facilitated the estimation of site occupancy. For every bird detected during the six minute period, we recorded species, sex, horizontal distance from the observer, minute we detected the bird and type of detection (e.g., call, song, visual). Observers measured distances using laser rangefinders. When it was not possible to measure the distance to a bird, observers estimated distance by measuring to some nearby object. Observers also recorded the presence of species which are rare or difficult to detect (i.e., grouse, owls, raptors) while we traveled between points within a grid cell. We considered all non-independent detections of birds (i.e., flocks or pairs of conspecific birds

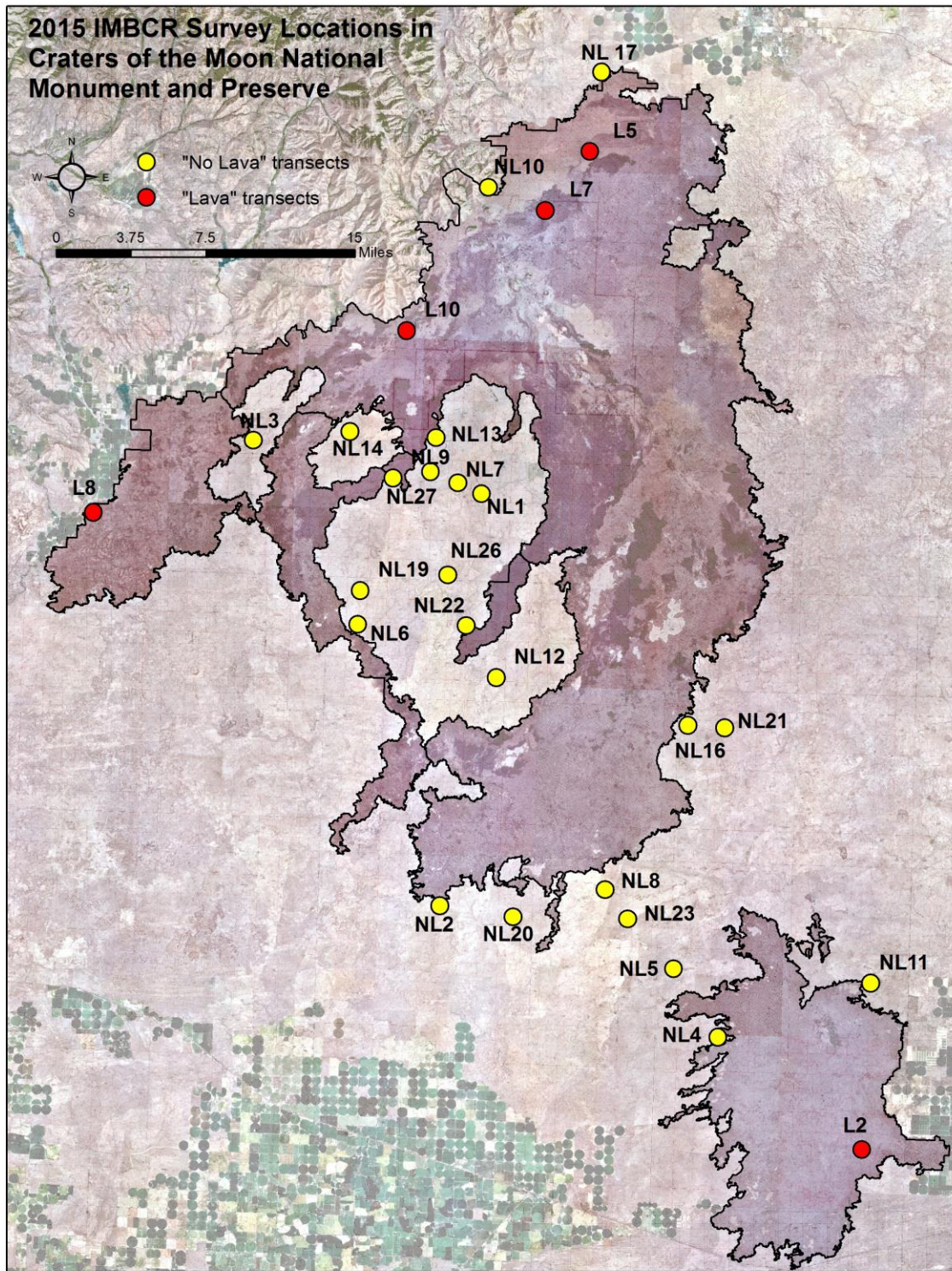
together in close proximity) as part of a ‘cluster’ rather than as independent observations. Observers recorded the number of birds detected within the cluster along with a letter code to keep track of each distinct cluster.

At the start and end of each transect, observers recorded time, ambient temperature, cloud cover, precipitation and wind speed. Technicians navigated to each point using hand-held Global Positioning System (GPS) units. Before beginning each six-minute count, surveyors recorded vegetation data (within a 50 meter radius). We recorded vegetation data including: the dominant habitat type and structural stage; the relative abundance, percent cover and mean height of trees and shrubs (by species); and grass/forb height and groundcover. We recorded vegetation data quietly to allow birds, potentially disturbed by our approach, time to return to their normal habits prior to beginning each count.

In this report, we summarize the relative abundance of all species detected during 2015 surveys. Following the methodology of White et al. (2012), BCR staff and other collaborators will conduct multi-scale occupancy analyses and calculate density estimates by strata, including for the CRMO. A detailed, final report containing this information will be made available by March 2016; meanwhile, see RMBO (2015).

Lastly, it is important to point out that because points are 250 m apart, it’s likely that some individuals, especially of larger, louder, and/or more mobile species, were detected from ≥ 2 survey points within a grid. Thus, the raw counts shown in Table 1 likely overestimate the actual number of individuals detected; instead, they represent the total number of detections (e.g. 14 Ferruginous Hawks on transect NL-23, does not necessarily mean 14 different individuals were detected, but rather the species was detected 14 times during the 6-minute point count (i.e. a repeatedly calling individual).

Figure 1. Location of the 28 spatially-balanced survey grid locations surveyed in 2015 on the Craters of the Moon National Monument and Preserve



RESULTS and DISCUSSION

Spatially-balanced landbird surveys across the Craters of the Moon National Monument and Preserve in 2015 showed a relatively diverse breeding bird community, especially consisting of species that rely on shrubsteppe, grassland, and/or rocky habitats. We detected a total 4,397 individuals of 55 different species during the 2015 breeding season (Table 1). Many species detected were likely local breeders but several passage migrants of species that normally breed in wooded and/or higher elevation areas were observed during our surveys in late May – a time when some landbird species are still actively migrating to breeding areas. In order of descending abundance, the 10 most frequently detected species were: Western Meadowlark (n = 1152), Horned Lark (973), Brewer’s Sparrow (724), Rock Wren (230), Grasshopper Sparrow (214), Common Raven (192), Mourning Dove (156), Sage Thrasher (135), Vesper Sparrow (123), Brown-headed Cowbird (84), and Spotted Towhee (56). We detected 12 species listed by the BLM and/or IDFG as species of concern during 2015 surveys, including Black-throated Sparrow, Brewer’s Sparrow, Burrowing Owl, Ferruginous Hawk, Grasshopper Sparrow, Greater Sage-grouse, Green-tailed Towhee, Loggerhead Shrike, Long-billed Curlew, Sage Thrasher, Sagebrush Sparrow, and Short-eared Owl.

The 10 most frequently detected species from **lava** counts were: Rock Wren (112), Mourning Dove (45), Western Meadowlark (36), Brown-headed Cowbird (32), Spotted Towhee (29), Brewer’s Sparrow (23), Common Raven (12), Clark’s Nutcracker (9), Violet-green Swallow (7), and Sage Thrasher (7; Table 1). Also, there were 12 species detected during lava counts that were not found in the non-lava strata. Noteworthy among these are Black-throated Sparrow, Clark’s Nutcracker, Lazuli Bunting, Short-eared Owl, and Yellow Warbler.

The 10 most frequently detected species from **non-lava** counts were: Western Meadowlark (1,116), Horned Lark (972), Brewer’s Sparrow (700), Grasshopper Sparrow (214), Common Raven (180), Sage Thrasher (128), Vesper Sparrow (123), Rock Wren (117), Mourning Dove (111), and Brown-headed Cowbird (52; Table 1). Additionally, there were 19 species detected during non-lava counts that were not found in the lava strata. The most noteworthy among these are Burrowing Owl, Ferruginous Hawk, Gray Flycatcher, Greater Sage-grouse, Green-tailed Towhee, Loggerhead Shrike, Long-billed Curlew, Northern Harrier, Sagebrush Sparrow, Western Bluebird, Western Tanager, and Yellow-rumped Warbler.

Table 1. Detections by species and survey grid for 2015 spatially-balanced surveys on the Craters of the Moon National Monument and Preserve. “L” signifies grids *on* lava flows and “NL” signifies grids *away from* lava flows.

^a **BLM Species of Concern;** http://www.blm.gov/id/st/en/prog/wildlife_and_fisheries/idaho_sss_type_2_wildlife.html

^b **Idaho Department of Fish and Game Species of Greatest Conservation Need**
https://idfg.idaho.gov/species/taxa/list/sgcn?field_taxa_categories_target_id=35&=Filter

Species	L 2	L 5	L 7	L 8	L 10	NL 1	NL 2	NL 3	NL 4	NL 5	NL 6	NL 7	NL 8	NL 9	NL 10	NL 11	NL 12	NL 13	NL 14	NL 16	NL 17	NL 19	NL 20	NL 21	NL 22	NL 23	NL 26	NL 27	Total
American Goldfinch			1									4													1			2	8
American Kestrel		2																											2
Barn Swallow					1		1								1							1							4
Black-billed Magpie				1																									1
Black-throated Sparrow ^a					6																								6
Brewer's Blackbird								4										2	2								1	3	12
Brewer's Sparrow ^{a,b}		10		2	11	26	6	47	2	25	63	62	2	8	56	21	32	32	42	10	16	37	14	4	50	42	34	70	724
Broad-tailed Hummingbird																											1		1
Brown-headed Cowbird	15	1		10	6			6	7		7	1		2		1		16	1		2	3	2		1			3	84
Burrowing Owl ^{a,b}																										5			5
Calliope Hummingbird					1																								1
Canada Goose										6								8								2			16
Chipping Sparrow														3															3
Chukar					2										4														6
Clark's Nutcracker		8	1																										9
Cliff Swallow	1																												1
Common Nighthawk			1							1																			2
Common Raven		2	5	4	1	4	5	42	4	42	9	1	3	3	4	9	1	8	6	5	4	1	2	5	3	16	1	2	192
Dusky		1	1															1			1								4

Species	L 2	L 5	L 7	L 8	L 10	NL 1	NL 2	NL 3	NL 4	NL 5	NL 6	NL 7	NL 8	NL 9	NL 10	NL 11	NL 12	NL 13	NL 14	NL 16	NL 17	NL 19	NL 20	NL 21	NL 22	NL 23	NL 26	NL 27	Total
Flycatcher																													
Eurasian Collared-Dove			1																										1
Ferruginous Hawk ^{a,b}																									14			14	
Grasshopper Sparrow ^{a,b}						4	12	1		8		29	12			27	29	2	3	19			13	16	7	31		1	214
Gray Flycatcher										1																		1	
Greater Sage- grouse ^{a,b}												2								8	1	2		15	1		3	3	35
Green-tailed Towhee ^a								1							5													6	
Horned Lark		1				20	72	19	5	34	32	67	54	1		36	115	13	18	44	1	16	65	44	80	98	87	51	973
House Finch	5		1																									6	
Killdeer					1																						11	12	
Lark Sparrow	5			2			1	1	16		4			4											4			37	
Lazuli Bunting					1																							1	
Loggerhead Shrike ^a								3		1	2			2				1				1		1	2			13	
Long-billed Curlew ^{a,b}							3	2		3			8													3		19	
Mountain Bluebird	1		2															4										7	
Mourning Dove	11	13	9	8	4	1	1	14	15	8	6	1		11	4	21		6		7	3		6	1	4	1	1	156	
Northern Flicker		3							2			1																6	
Northern Harrier															3										1		1	5	
Pine Siskin		1	4		1			2	1										1									10	
Red-tailed Hawk		1																										1	
Red-winged Blackbird																									1			1	
Rock Pigeon																					3							3	
Rock Wren	27	30	10	25	21		15	1	13	2	8			18		8		19			15	1	3	1	13			230	
Sage Thrasher ^a		3	3	1		1		28		6	8	7		1	2	1		11	14		4	16		1	8	1		19	135
Sagebrush								1			7											4						12	

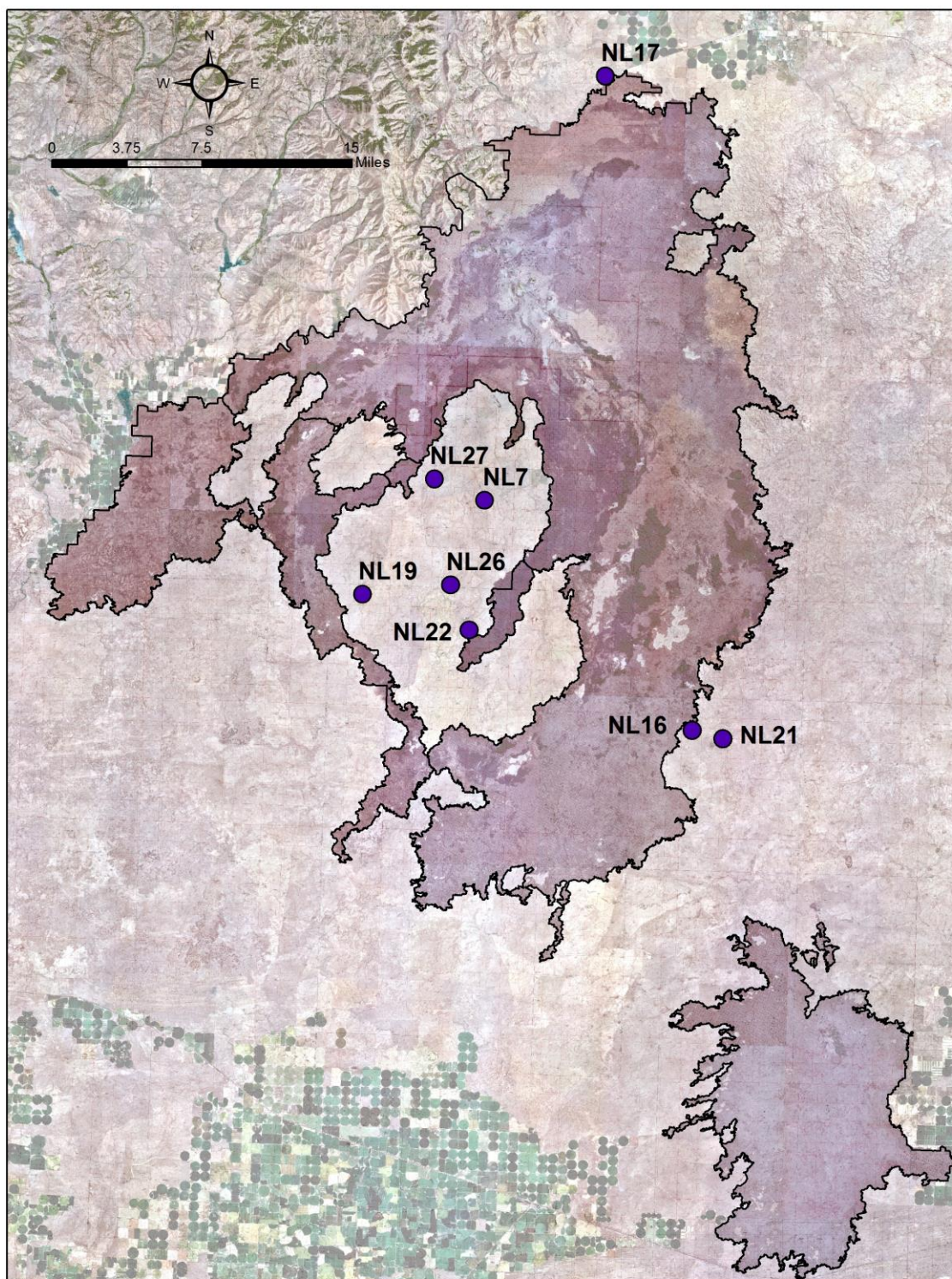
Species	L 2	L 5	L 7	L 8	L 10	NL 1	NL 2	NL 3	NL 4	NL 5	NL 6	NL 7	NL 8	NL 9	NL 10	NL 11	NL 12	NL 13	NL 14	NL 16	NL 17	NL 19	NL 20	NL 21	NL 22	NL 23	NL 26	NL 27	Total
Sparrow ^a																													
Say's Phoebe	5		1				1		1												1								9
Short-eared Owl ^{a,b}		1																											1
Spotted Towhee		2	5	3	19										27														56
Turkey Vulture							1																						1
Unknown Bird	5	1	1		2		2	1			1			6	3	3	1		2		1	3				1		1	34
Unknown Duck													4																4
Unknown Hummingbird			1																										1
Unknown Sparrow						1			2	1				1		2					6							1	14
Unknown Swallow														1															1
Unknown Warbler									1																				1
Vesper Sparrow						1		6				37						18	10	2	1				1		2	45	123
Violet-green Swallow			6	1					1									2											10
Western Bluebird																											4		4
Western Kingbird																1													1
Western Meadowlark	9	16		3	8	22	37	66	26	51	85	64	29	61	1	52	54	41	36	59	36	55	36	37	54	57	105	52	1152
Western Tanager																1													1
Yellow Warbler				1																									1
Yellow-rumped Warbler																		4											4
Grand Total	84	96	53	62	85	80	157	245	96	189	232	276	112	122	110	183	232	188	135	154	95	140	141	125	231	272	250	253	4,397

LITERATURE CITED

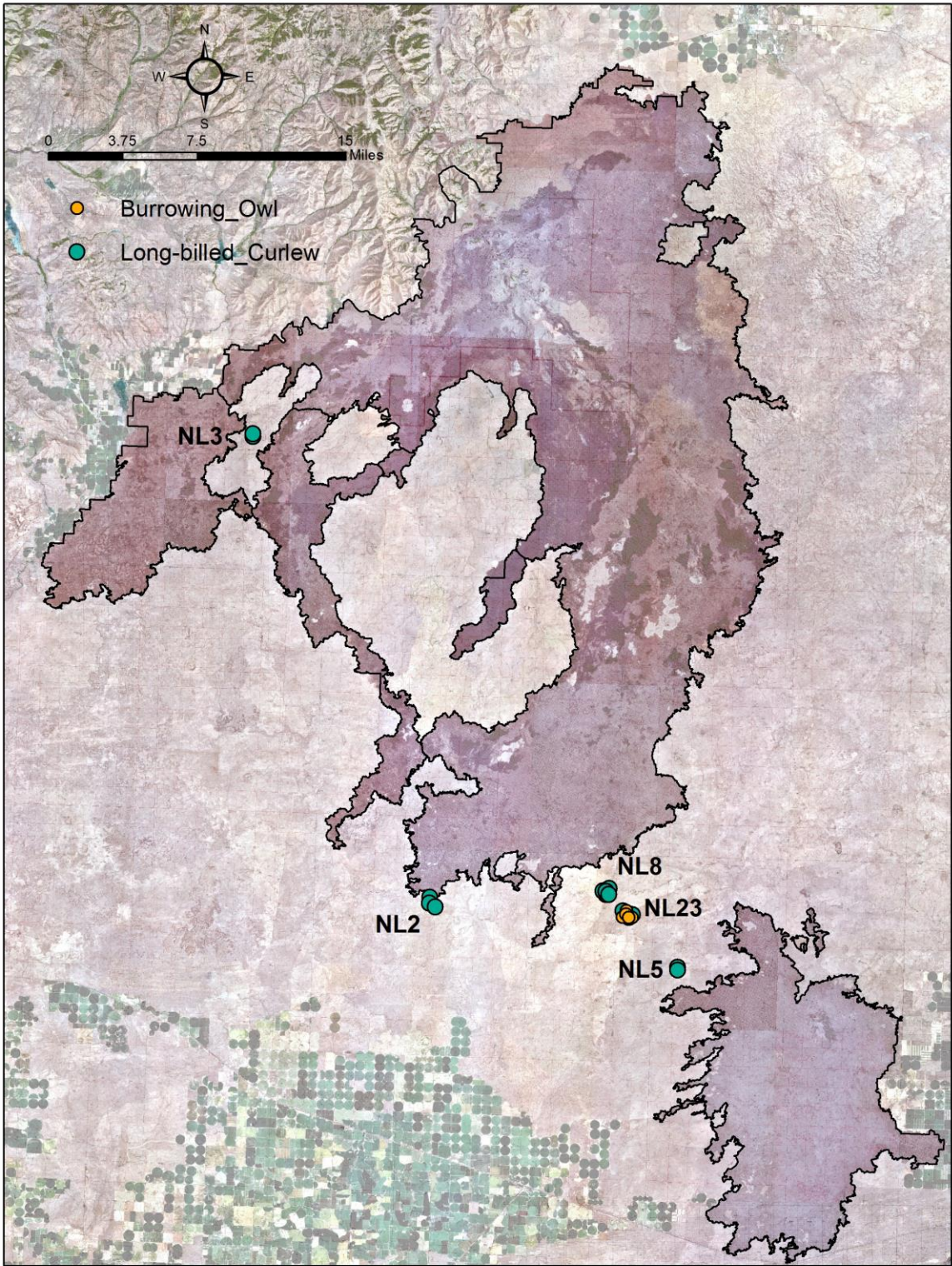
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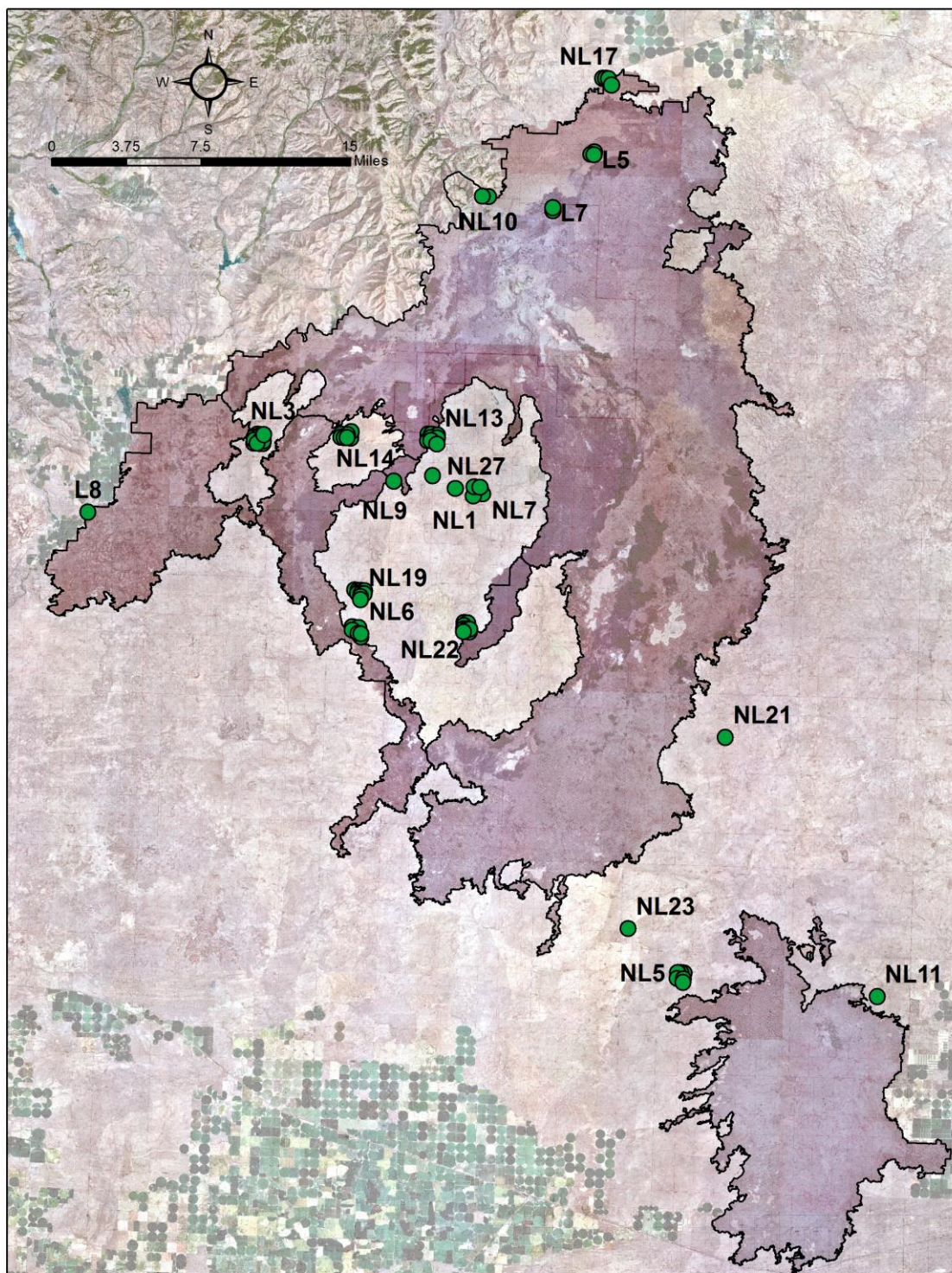
Appendix 1a. Observations of Greater Sage-grouse during 2015 surveys on the Craters of the Moon National Monument and Preserve



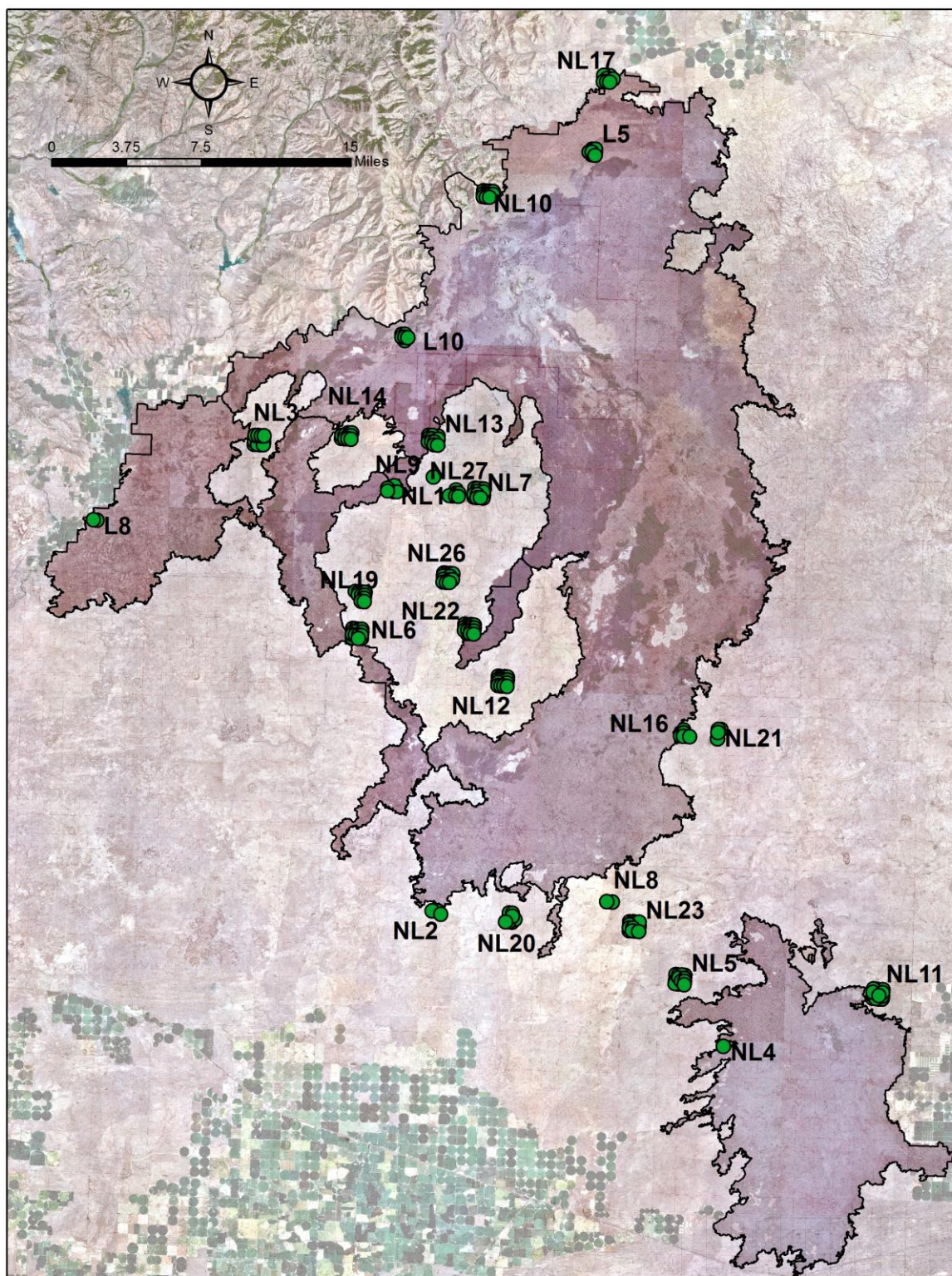
Appendix 1b. Observations of Burrowing Owl and Long-billed Curlew during 2015 surveys on the Craters of the Moon National Monument and Preserve



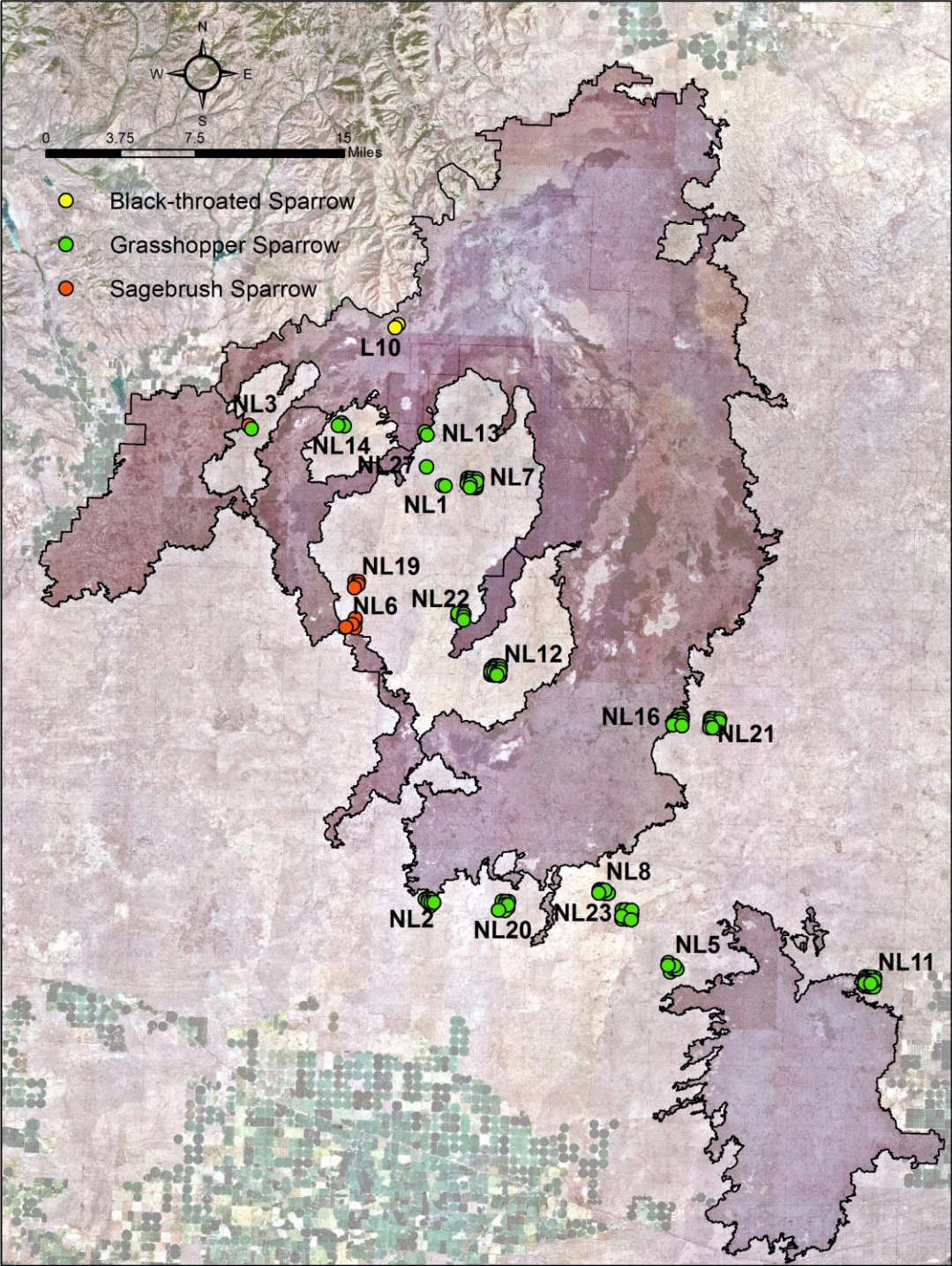
Appendix 1c. Observations of Sage Thrasher during 2015 surveys on the Craters of the Moon National Monument and Preserve



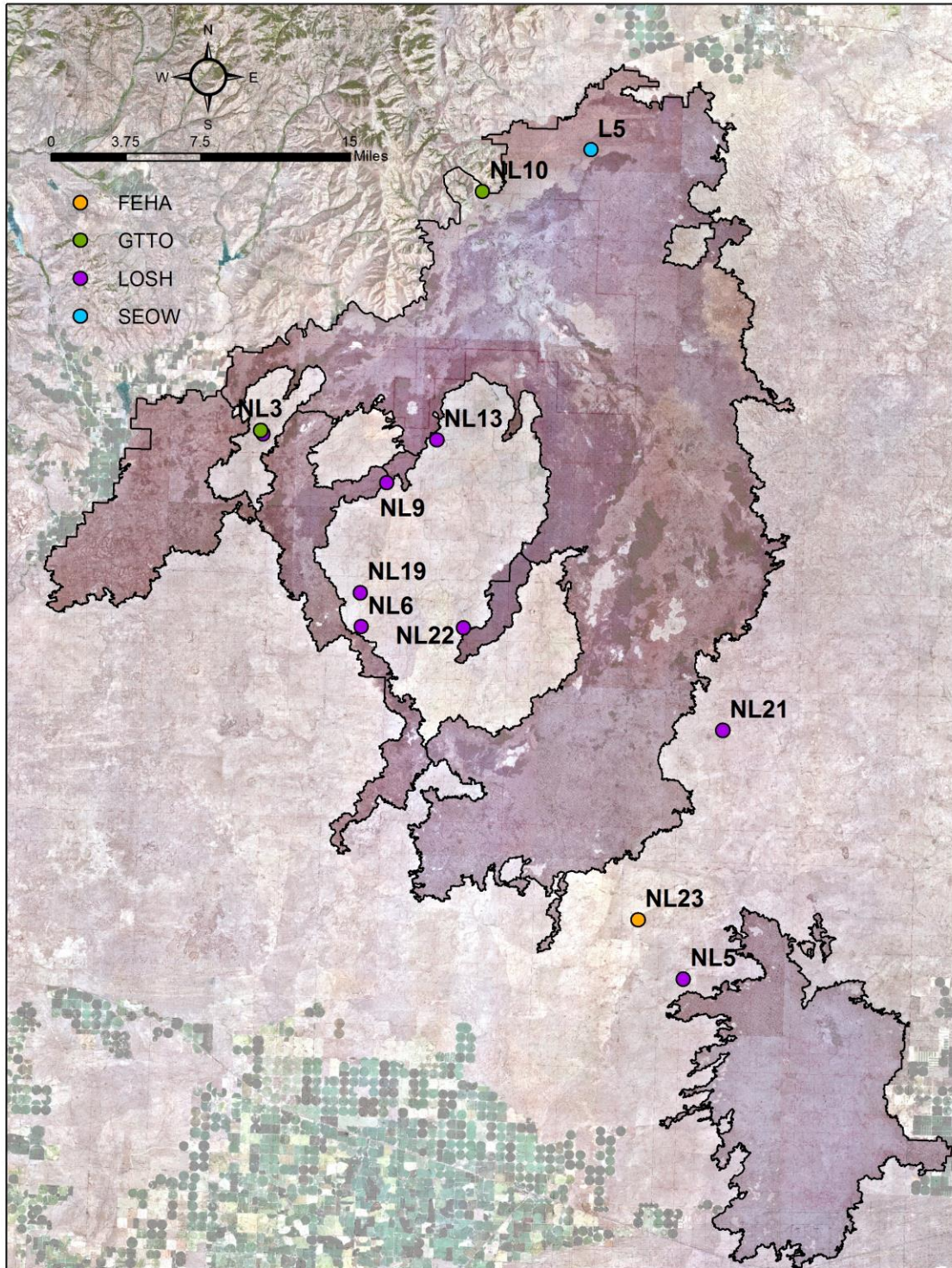
Appendix 1d. Observations of Brewer's Sparrow during 2015 surveys on the Craters of the Moon National Monument and Preserve



Appendix 1e. Observations of three sparrow species (Black-throated, Grasshopper, and Sagebrush) during 2015 surveys on the Craters of the Moon National Monument and Preserve



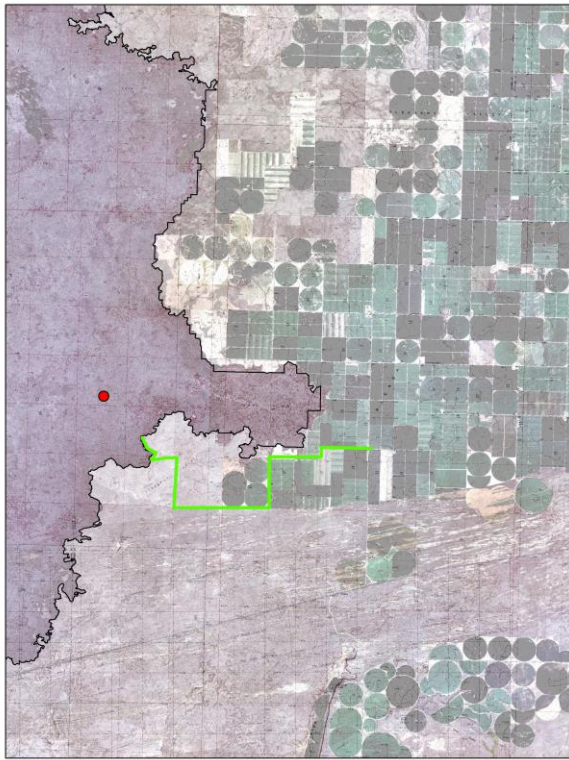
Appendix 1f. Observations of Ferruginous Hawk (FEHA), Green-tailed Towhee (GTTO), Loggerhead Shrike (LOSH) and Short-eared Owl (SEOW) during 2015 surveys on the Craters of the Moon National Monument and Preserve



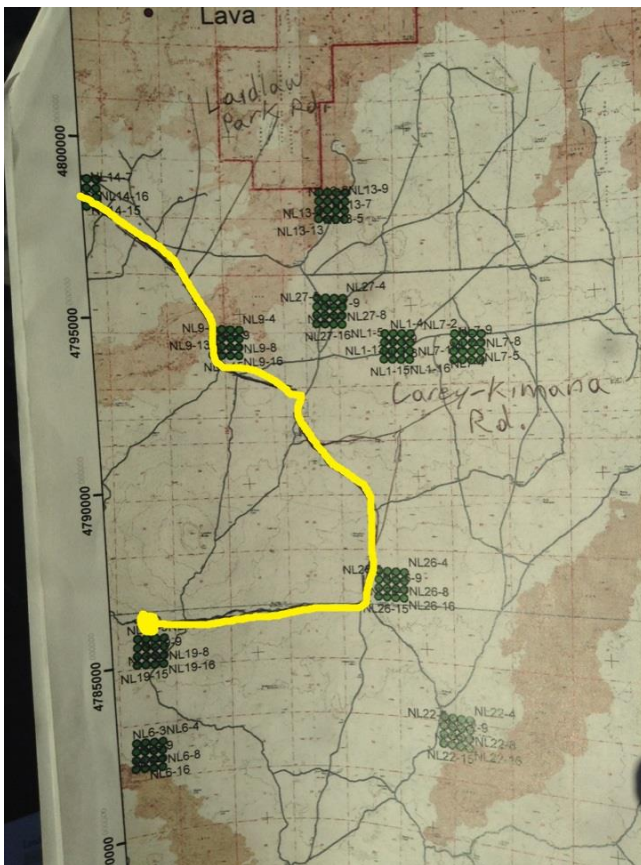
Appendix 2. Access notes for certain survey grid locations on Craters of the Moon National Monument and Preserve. Most routes require navigation on main gravel roads and/or rough 2-tracks using BLM maps to get as close as possible to the grid; high clearance and 4-WD preferred. If there has been recent significant rainfall, some of the 2-tracks can be impassable due to mud.

Grid	Notes
L2	Far southeastern lava grid – see route map below for final few miles; includes driving through a rope gate onto a BLM allotment (permission granted by Burley Field Office). Need high clearance because primitive 2-track and some sections have sage growing in “roadway”.
L6	Park/camp at Wapi Park (beware muddy roads after rain) – grid is ~800m southeast
L7	Can walk Sunset Flow trail (old 2-track) from Hwy 20/26 south to within 1km of grid
L8	Need access via private land (but do not have landowner info). Can still do the minimum number of points on public land if private access is denied.
L10	Park at Hwy pullout about 7.7 miles west of visitor center (Zone 12, 284702, 4807392) and walk south.
NL2	Came up from Minidoka. Arco-Minidoka Rd. Took bear Trap Cave Rd but could probably come from Corey-Kimana Rd. Access anywhere about 1km from road south of transect. 12/ 0287969 4758500. Cattle fence between eastern-most 4 points and rest of grid.
NL4	From Hwy 24 (going north), turn right on Broadway street at Minidoka, when Hwy 24 takes a sharp left turn. Continue on Broadway until you reach your first left, which will take you over the railroad tracks. Directly after crossing the railroad tracks, take a right, and then soon afterwards, a left (it will be the first left hand turn). At the T-intersection, take a right on E1000N Rd, until you reach the Arco-Minidoka north (it may be labeled Desert Road on the road sign). Take a left on this road (go north) and continue on this road for approximately 10 miles, until the road takes a fairly hard left hand turn (on the map, look for the place where the Arco to Minidoka road turns towards the NW, and there is another road right at the curve). Turn on this road (it will be on your right) and continue on it until you reach a T intersection. WARNING: there are a lot of rocks on this road, as well as mud, so be very careful, especially if you do not have high clearance. Take a right at the T intersection, and continue down this road. I was forced to stop 5km short of the transect, due to a very large mud puddle. AP coordinates: 12 T 0306308 4751352
NL5	On the Arco-to-Minidoka road, continue approximately .65 miles (north) from the turnoff for NL4 and then take a right. This road is also very primitive and requires high clearance – beware of mud puddles. Continue straight on this road until you reach the transect. You can camp anywhere on the road near to the transect. AP coordinates: 12 T 0307443 4755041
NL6	Don’t take direct road. Two-track that is not always there. Go around and use Carey-Kimana road. Turn W on connecting road that goes to NL19. Then turn S at NL19. Access point: 12 T 0282697 4783374 1km out from grid. Easy hiking.
NL9	From Carey, drive east until you reach Laidlaw Park Rd (which will be on the right) and

	drive down this road until you reach the AP. The road can be very muddy depending on weather conditions, so be careful. The AP is within 15 meters of the first point. Because of that, I am not going to list an AP – simply navigate to the point nearest to the road.
NL10	Need gate access from NPS (Craters) to go north through gate past group camp area and follow road to grid, also point NL10-4 is on private land (no contact info).
NL11	From American Falls, take Hwy 39 until you reach N Pleasant Valley Road, and then take a left. Continue on this road and then you will take a right on Winters road. In approximately 3.75 miles, take a left on Crystal Ice Cave Rd. Continue on Crystal Ice Cave Rd for about 1.5-2.0 miles and then the grid will be on your left. You can either park somewhere along the main road, or take one of the smaller dirt roads off of Crystal Ice Cave Rd., to get a bit closer. AP coordinates: 12 T 0323257 4754267
NL15	Requires long, slow drive on rough 2-track with several large lava rocks on road. Road to grid starts at zone 12 285712/4758920, ~ 8 miles to camp spot at 286676/4769348. Need high clearance for last 2 miles.
NL16 & NL21	Not obvious turn to west (towards both grids) located as 314780/4774823; can camp at 310106/4773474, which is located between the two grids (1.6km to 16 and 800m to 21).
NL19	See photo below for suggested route
NL20	Took Arco-Minidoka Road To Bear Trap Cave Road. Access @ 12 T 0293176 4758228 about 1km out.
NL23	Came up from Minidoka. Took Arco-Minidoka Road. Turn W on Bear Trap Cave Road. Access point on road. 1 km S of grid. Access point: 12/ 0304519 4757240



Lava 2 access



NL-19 access