Audubon ALASKA

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Photo by Donna Dewhurst, U.S. Fish and Wildlife Service

Birds 'n' Bogs Citizen Science Program

2015 Annual Report

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Annual Report 2015

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Abstract

In 2015, Birds 'n' Bogs, a project initiated by Audubon Alaska and the University of Alaska's Department of Geography and Environmental Studies, conducted the third consecutive season of surveys for boreal wetland birds across selected wetlands in Anchorage and the Matanuska Valley. Through May citizen scientists collected data on the distribution and abundance of seven target species: Lesser Yellowlegs, Greater Yellowlegs, Solitary Sandpiper, Rusty Blackbird, Olive-Sided Flycatcher, Tree Swallow, and Violet-Green Swallow. A total of thirty-four volunteers participated in the Birds 'n' Bogs program in 2015, surveying thirty sites in Anchorage and eight sites in the Matanuska Valley. In Anchorage participants observed 207 Lesser Yellowlegs, 68 Greater Yellowlegs, 5 Solitary Sandpipers, 10 Rusty Blackbirds, 282 Tree Swallows, and 50 Violet-Green Swallows. In the Matanuska Valley a total of 165 Lesser Yellowlegs, 18 Greater Yellowlegs, 3 Rusty Blackbirds, 28 Tree Swallows, and 11 Violet-Green Swallows were observed. The results were then compiled using Geographic Information Systems (ArcGIS) in order to display variation in bird distribution over the season.

Introduction

In order to assess the status of declining boreal wetland birds, Audubon Alaska and the Geography and Environmental Studies Department at the University of Alaska Anchorage initiated the Birds 'n' Bogs citizen science program in 2013. The program evaluates the distribution of seven target wetland species—Lesser Yellowlegs (*Tringa flavipes*), Greater Yellowlegs (*Tringa melanoleuca*), Solitary Sandpiper (*Tringa solitaria*), Rusty Blackbirds (*Euphagus carolinus*), Olive-Sided Flycatchers (*Contopus cooperi*), Tree Swallows (*Tachycineta bicolor*), and Violet-Green Swallows (*Tachycineta thalassina*)—throughout wetland locations in Anchorage and the Matanuska Valley. This report highlights the findings of the 2015 survey season.

For reasons not fully understood, many boreal wetland bird species have been experiencing declines for the last several decades (Greenberg *et al.* 2011). In fact, since the

1960s Rusty Blackbirds and Solitary Sandpipers have declined at a rate of 6.2% per year, Lesser Yellowlegs at 5.3%, and Olive-Sided Flycatchers at 3.5% in North America (Bart *et al.* 2007, Ottema and Ramcharan 2009, Greenberg *et al.* 2011, Sauer *et al.* 2011). As a result, a number of boreal species are now considered to be of conservation concern in Alaska and across the nation (Brown *et al.* 2001; Rich *et al.* 2004; COSEWIC 2006, 2007; U.S. Fish and Wildlife Service 2008; Kirchhoff and Padula 2010). In the absence of quantitative information on population size or demographics, investigating trends in local distribution and wetland occupancy is valuable for establishing conservation priorities for organizations such as Audubon Alaska.

Habitat used by boreal-nesting birds has been significantly degraded over the past few decades. Although the boreal forest biome has remained relatively intact compared to other ecosystems globally, it has been altered by climate change, insect outbreaks, and more frequent and intense forest fires (Clay 2012). Commercial hydropower and oil and gas projects pose potential threats to the boreal wetlands of Southcentral Alaska (Rich *et al.* 2004). Increased regional temperatures have resulted in smaller and shallower wetlands, altering wetland edges and affecting species composition. Other potential influences include the widespread use of pesticides and other agro-chemicals that can directly compromise the health of these birds as well as altering the quality of available food resources (Fry 1995). On the local level, the development of land for residential and commercial purposes has resulted in habitat loss and fragmentation near Anchorage, Alaska, and in the Matanuska Valley region. The combination of these risk factors created the impetus for implementing the Birds 'n' Bogs program to address current and future trends in boreal bird species' distribution in the Anchorage Bowl and Matanuska Valley.

Methods

The Birds 'n' Bogs citizen science program relies on volunteer participants to conduct surveys across a suite of wetlands in Anchorage and the Matanuska Valley each spring. In 2015, volunteers performed a series of surveys during the month of May in order to collect seasonal distribution information for seven target species: Lesser Yellowlegs (LEYE), Greater Yellowlegs (GRYE), Solitary Sandpiper (SOSA), Rusty Blackbird (RUBL),

Olive Sided Flycatcher (OSFL), Tree Swallow (TRES), and Violet-Green Swallow (VGSW). Prior to the surveys, volunteers were provided with training on target species identification in the field as well as on survey protocols and data recording methods. After each training session, volunteers chose a specific wetland to survey throughout the project. Most volunteers chose to survey singly or in pairs, with a few larger groups.

Consistent with the 2014 Birds 'n' Bogs survey season, data collection took place over four survey periods: May 10–14, May 15–20, May 21–26, and May 27–June 1. During each survey period volunteers observed their location for at least 20 minutes either prior to 8:00 am or between 6:00–10:00 pm, for a total of 80 minutes of survey time across the entire season (May 10–June 1). Participants either observed their wetland from a single location or walked some or all of the perimeter during each survey, and recorded date, time, weather, GPS coordinates, the number of target species seen and heard, sex of individual birds (if known), and any observed behavior consistent with the breeding behavior categories identified in the eBird online database. Survey efforts also included recording any non-target bird species that were identified. At the conclusion of the surveys all observation data were entered into Excel and maps were created using ArcGIS in order to evaluate patterns of distribution for the target species. A new effort in 2015 was the inclusion of survey data into eBird where volunteers felt comfortable entering it. (This was the pilot season for using eBird data entry.)

During the 2015 season site names were also standardized to match locations used in the eBird online database. This will be beneficial for making the survey information more useful for future Birds 'n' Bogs efforts (see Appendix 1 for eBird and 2015 season location names that differed) as well as for other research or conservation purposes. The eBird site names will be used in this report. Anchorage sites for the 2015 season included: Cheney Lake, Potter Marsh—Boardwalk, Potter Marsh South Pullout, Connors Lake, Helen Louise McDowell Sanctuary, Basher Lakes, Basher Lakes 2, Westchester Lagoon, Klatt Bog East, Waldron Pond, Great Land Trust Parcel, Campbell Tract, Carr-Gottstein Park, Taku Lake, Business Park Wetlands, Johns Park, Oceanview Bluff Park, Elmore Bog North, Elmore Bog South, Baxter Bog, Goose Lake, Coastal Trail—Chester Creek to Fish Creek,

Minnesota Bog, Storck Park, Golden View Middle School, Rabbit Creek, Lake Hood Drive & Helio Place Intersection, Hanshew Middle School—Ruth Arcand Park, Earthquake Park, Detox Center—Recycling Facility Anchorage International Airport (Figure 1) . The 2015 sites in the Matanuska Valley included: Goose Bay SGR, Eklutna Power Plant Tailrace, Palmer Hay Flats SGR—Reflections Lake, Palmer Hay Flats SGR—Rabbit Slough Access Road, Old Matanuska Townsite, Finger Lake Campground, Big Lake—Jordan Lake, Big Lake—West Beaver Lake, Pond East of 49th State Street (Figure 2).

Results

Overall, Birds 'n' Bogs volunteers spent 147.7 hours surveying wetlands in 2015, with 107.1 hours spent in the Anchorage Bowl and 40.6 hours spent in the Matanuska Valley. During the first survey period, May 10–14, twenty volunteers surveyed twenty-two sites totaling 33.33 person hours. For the second survey period, May 15–20, twenty-seven volunteers surveyed twenty-seven sites for a total effort of 39.83 person hours. The third survey period, May 21–26, utilized thirty-four volunteers surveying thirty-three sites for a total of 34.66 person hours. In the fourth survey period, May 27–June 1, thirty volunteers surveyed thirty-three sites for a total of 39.83 person hours. (When volunteers notified project managers in a timely manner they were unable to conduct a survey, staff completed the surveys.)

Species abundance. Tables 1 and 2 show the number of individuals of each of the seven target species observed in Anchorage and in the Matanuska Valley, respectively, in each survey period in 2015. The two most abundant species overall were LEYE and TRES, although TRES were more commonly observed in Anchorage than in the Matanuska Valley. The second and third survey periods were the most active in terms of bird observations in Anchorage, whereas the first survey period was the most active in the Matanuska Valley. Notably, no OSFL were seen during the 2015 season, similar to 2014. Solitary Sandpipers were only observed in Anchorage, not in the Matanuska Valley, in 2015.

Spatial distribution. LEYE were mostly confined to the coastal habitats of Anchorage in all survey periods, with fewer individuals found in more interior wetlands mostly in the first (May 10-14) and third (May 21-26) survey periods (Figure 3). A similar pattern but with fewer individuals was observed for GRYE (Figure 4). Only five SOSA were observed in Anchorage in May 2015, and these were all recorded in Far North Bicentennial Park in east Anchorage (Figure 5). Anchorage participants recorded ten RUBL overall (a mix of visual and audio observations); these were observed mostly along the southern coast of the city in or near the Anchorage Coastal Wildlife Refuge and Potter Marsh (Figure 6). TRES were widely observed across Anchorage, with the largest numbers

Table 1. *Total number of target bird species seen and heard in the Anchorage Bowl area May 10–June 1, 2015. LEYE = Lesser Yellowlegs, GRYE = Greater Yellowlegs, OSFL = Olive-sided Flycatcher, RUBL = Rusty Blackbird, SOSA = Solitary Sandpiper, TRES = Tree Swallow, and VGSW = Violet-green Swallow.*

SPECIES	LEYE	GRYE	SOSA	RUBL	OSFL	TRES	VGSW	TOTAL
May 10–14								
Seen	42	13	1	2	0	37	1	**96**
Heard	15	3	0	1	0	14	0	**33**
May 15–20								
Seen	34	22	2	2	0	43	14	**117**
Heard	15	8	0	2	0	39	1	**65**
May 21–26								
Seen	36	7	0	0	0	68	9	**120**
Heard	19	9	0	0	0	16	6	**50**
May 27–June 1								
Seen	30	3	2	3	0	50	16	**104**
Heard	16	3	0	0	0	15	3	**37**
TOTAL	**207**	**68**	**5**	**10**	**0**	**282**	**50**	**622**

Table 2. *Total number of target bird species seen and heard in the Matanuska Valley area May 10–June 1, 2015. LEYE = Lesser Yellowlegs, GRYE = Greater Yellowlegs, OSFL = Olive-sided Flycatcher, RUBL = Rusty Blackbird, SOSA = Solitary Sandpiper, TRES = Tree Swallow, and VGSW = Violet-green Swallow.*

SPECIES	LEYE	GRYE	SOSA	RUBL	OSFL	TRES	VGSW	TOTAL
May 10–14								
Seen	100	4	0	2	0	3	0	**109**
Heard	0	1	0	0	0	0	0	**1**
May 15–20								
Seen	28	6	0	1	0	11	1	**47**
Heard	0	0	0	0	0	0	0	**0**
May 21–26								
Seen	25	10	0	0	0	12	7	**54**
Heard	0	0	0	0	0	0	0	**0**
May 27–June 1								
Seen	9	0	0	0	0	2	3	**14**
Heard	3	2	0	0	0	0	0	**5**
TOTAL	**165**	**23**	**0**	**3**	**0**	**28**	**11**	**230**

being seen in coastal areas but several significant concentrations observed inland at Connors Lake and Helen Louise McDowell Sanctuary (where there are existing swallow nest boxes; Figure 7). VGSW were observed on the southern coast of the city but otherwise were more often found in interior sites (Figure 8).

In the Matanuska Valley, few LEYE were observed in 2015 except at Goose Bay, where approximately 100 were observed during the first survey period (Figure 9). Similarly, the largest number of GRYE were observed at Goose Bay with only two individuals observed outside that site (at Reflections Lake in the Palmer Hay Flats State Game Refuge; Figure 10). Only three RUBL were observed in the Matanuska Valley, two at Goose Bay and one at Big Lake—West Beaver Lake (Figure 11). TRES were observed at four of the eight sites surveyed in 2015, with no particular pattern (Figure 12). VGSW were observed at three of the same sites at which TRES were observed (Figure 13), possibly indicating that some sites are favored by swallows over others.

In all figures, overlapping symbols denote sightings of a given species at a particular location in >1 survey period. Instances in which birds were heard but not seen are not included in figures because it was uncertain whether they were actually using the habitat or just passing through. Legend categories correspond to the datasheet survey period titles: EE (early early) = May 10–14, E (early) = May 15–20, M (middle) = May 21–26; L (late) = May 27–June 1.

Discussion

Comparison across years. The number of participants remained the same as in 2014, which was an increase from 2013. 2015 saw the largest number of sites surveyed (38 compared to 24 in 2014 and 32 in 2013). More individuals of the target species were observed in Anchorage in 2015 than in 2014 (622 compared to 435) but approximately the same number as 2013 (602 total). The largest differences in abundance of target species in Anchorage were for LEYE and TRES: more LEYE were observed in 2015 than either 2014 or 2013, whereas more TRES were observed than 2014 but fewer than 2013. Fewer total individuals were observed in the Matanuska Valley in 2015 (230 compared to 299 in 2014; 2013 data was not tallied by species) even though more sites were surveyed in 2015 in the valley. Delayed volunteer training for the Matanuska Valley led to fewer surveys being completed in the first survey period and is potentially reflected in the lower overall counts for the 2015 season, which basically stem from fewer TRES and VGSW individuals being observed. The number of SOSA decreased from previous years with 5 documented in 2015, compared to 14 in 2014 and 23 in 2013. The number of RUBL observed across both study areas (13 total in 2015) was similar to 2014 (14 total) but fewer than in 2013 (30 total for Anchorage only). Compared to either 2013 or 2014, 2015 was a more normal year for spring temperatures both in Alaska and in the Lower 48, from which most boreal migrants are coming. This may have influenced our count data in this year, but also helps explain some of the variability in annual counts of target species we have observed over the last three years of the program.

Future plans. We plan to continue the Birds 'n' Bogs program in 2016 and beyond with (1) increased volunteer participation and wetland coverage, particularly in the Matanuska Valley; (2) more extensive use of eBird as a platform within which participants can archive their data themselves; (3) improved mapping tools to visualize and share patterns of bird occurrence over the years and across survey periods within a year; and (4) adding an index of recreational disturbance to the data collection protocol at each site to begin understanding how human activity influences the use of Anchorage and Matanuska Valley wetlands by declining boreal bird species. The use of eBird in particular will help facilitate multiple ways of analyzing and visualizing Birds 'n' Bogs data, and we also hope to develop an online discussion board for the program that will enable project leaders to post interesting facts, maps, or information about the program and allow volunteers to interact more easily with project leaders and each other. We feel that 2015 marks the end of the three-year "initiation phase" of this citizen science program, and we look forward to incorporating the lessons learned into an improved version of the program as we move into the next phase.

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Figure 1. Survey wetland locations in 2015 in the Anchorage Bowl. Red dots indicate actual wetland locations; names are generally centered below each location. In this and all other Anchorage maps, blue/green hashed areas indicate wetlands.

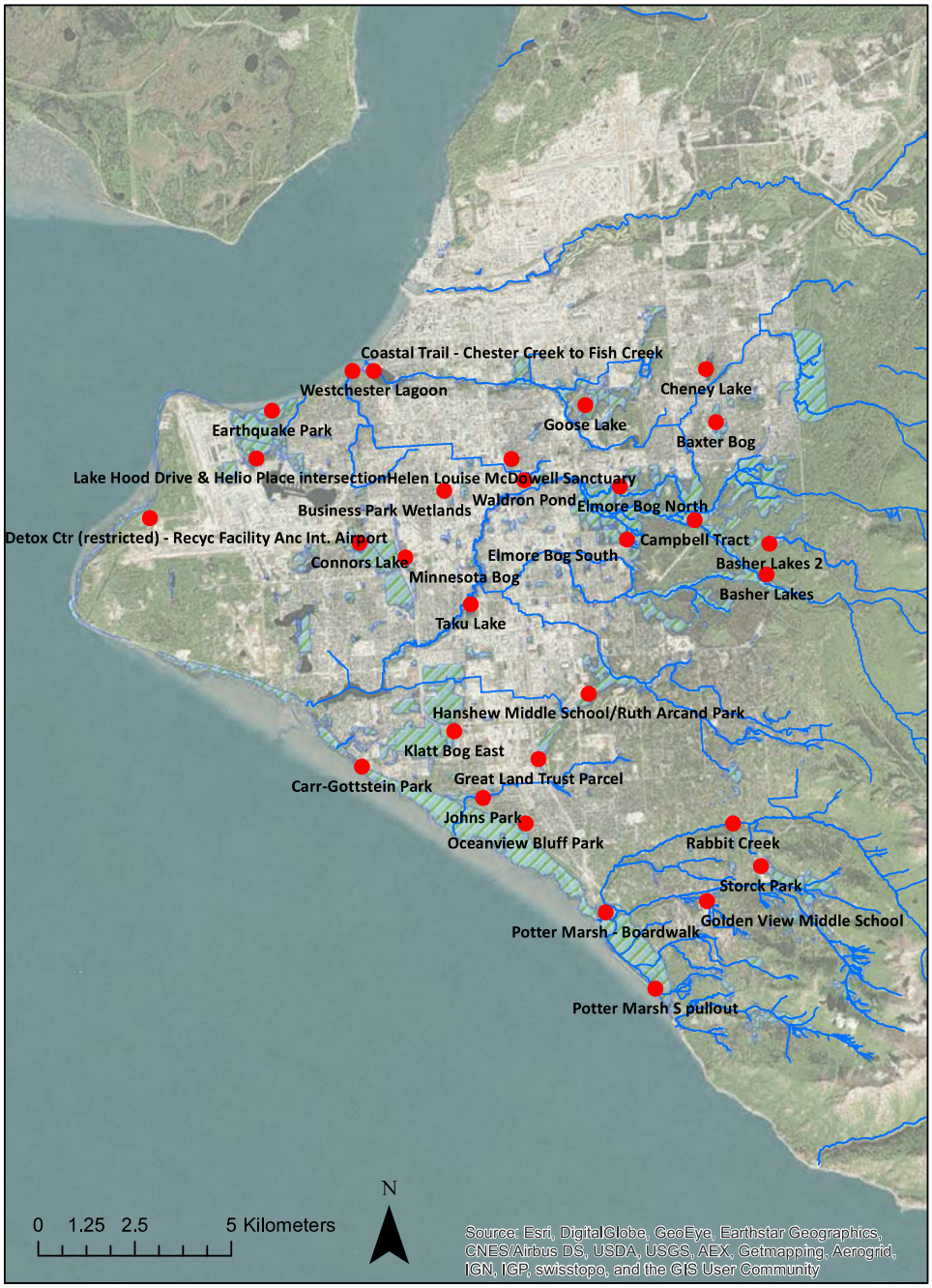


Figure 2. Survey wetland locations in 2015 in the Matanuska Valley. Red dots indicate actual wetland locations; names are generally shown above and to the right of the wetland location.

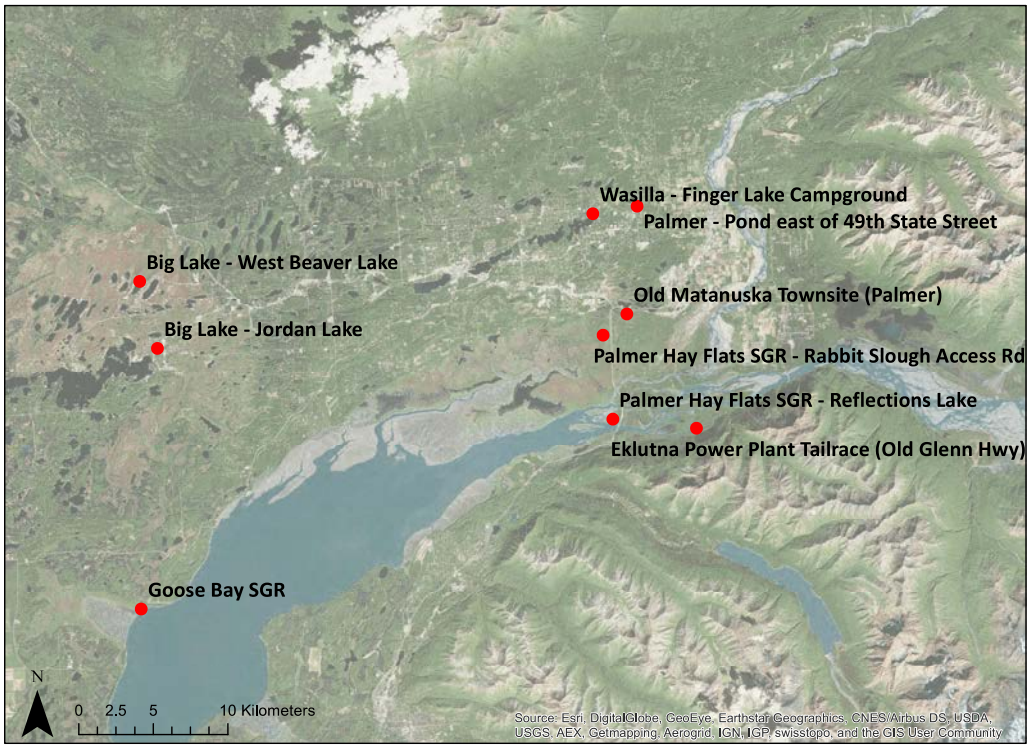


Figure 3. Lesser Yellowlegs observations in the Anchorage Bowl in 2015.

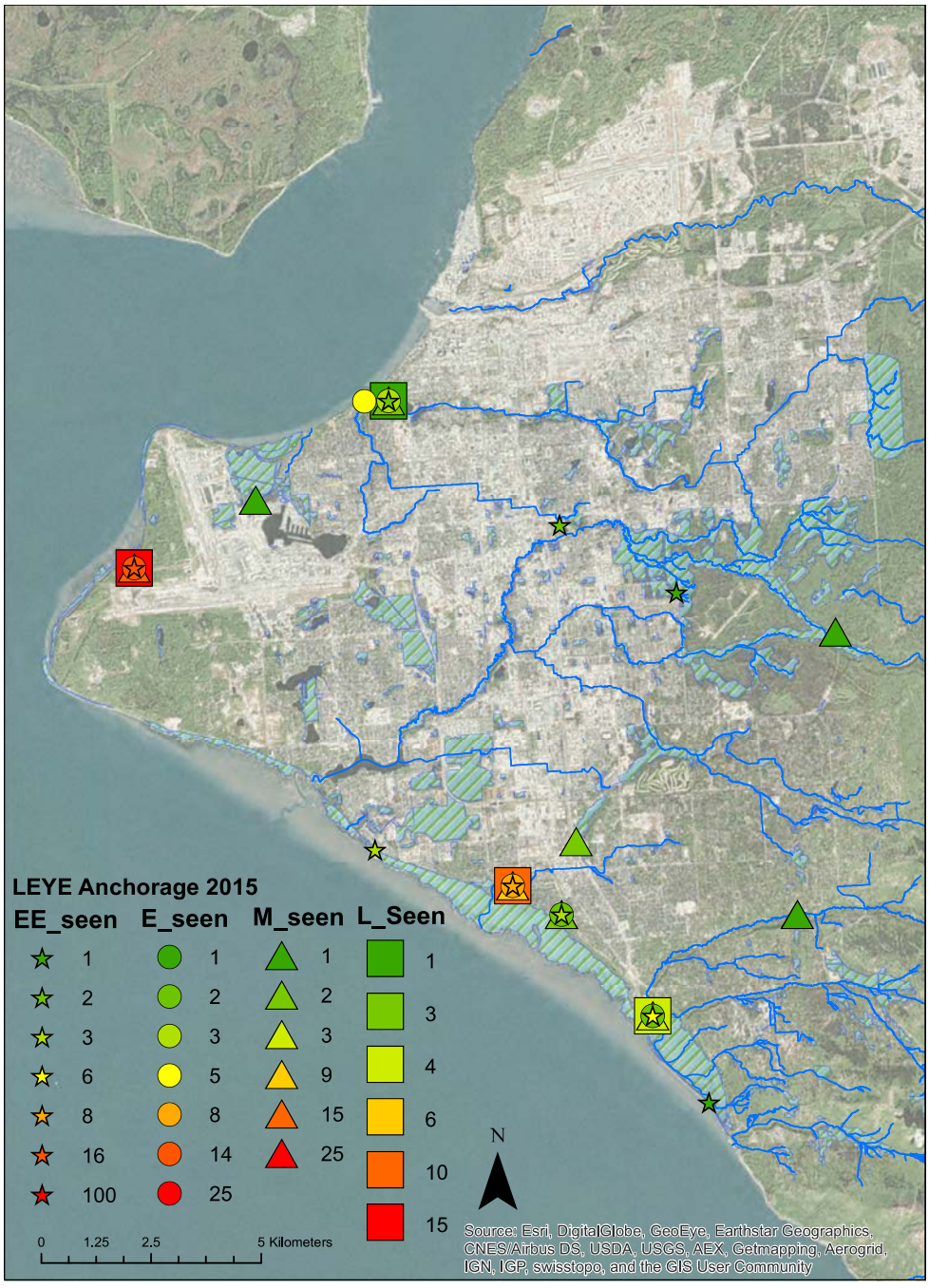


Figure 4. Greater Yellowlegs observations in the Anchorage Bowl in 2015.

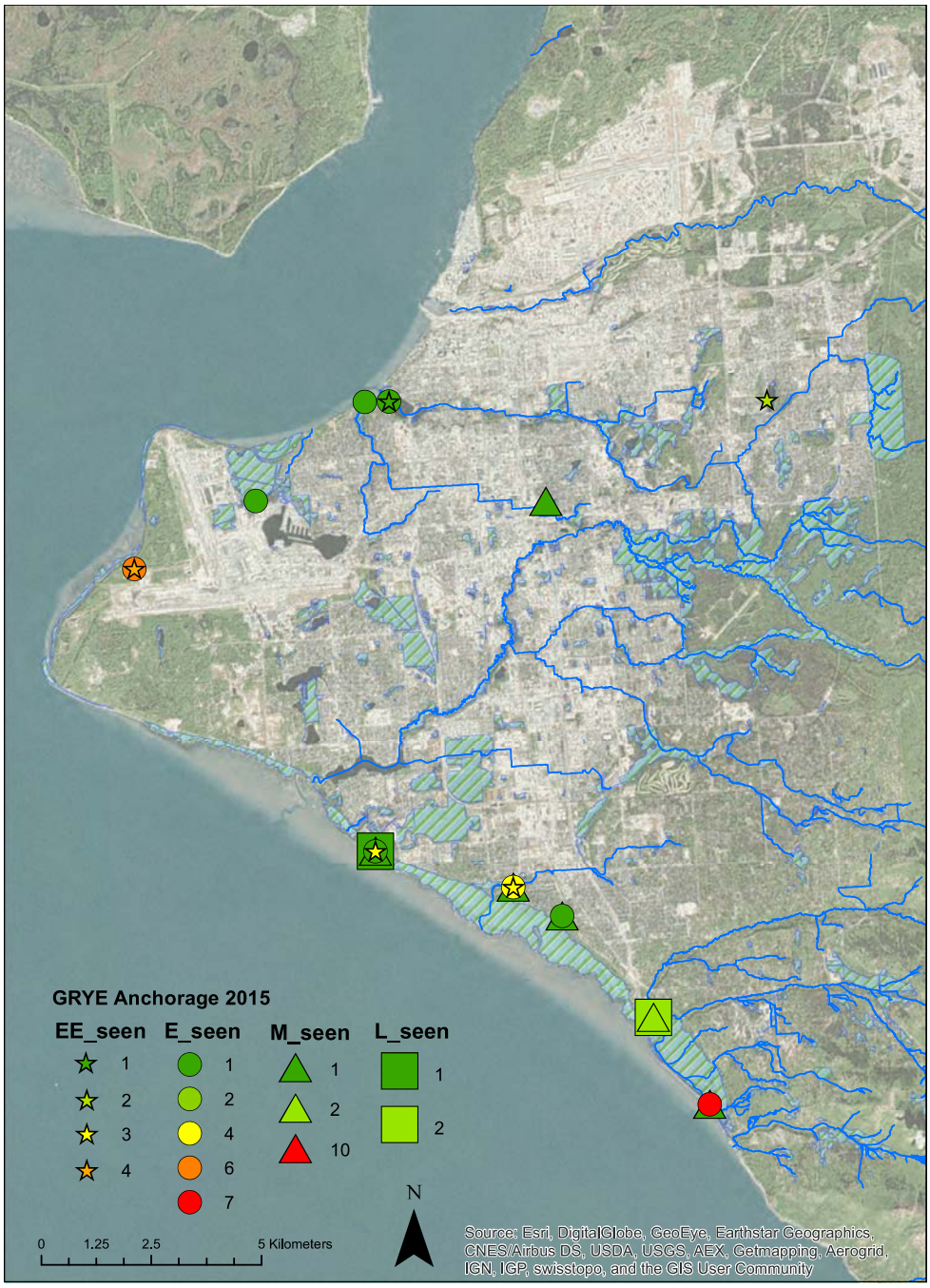


Figure 5. Solitary Sandpiper observations in the Anchorage Bowl in 2015.

Figure 6. Rusty Blackbird observations in the Anchorage Bowl in 2015.

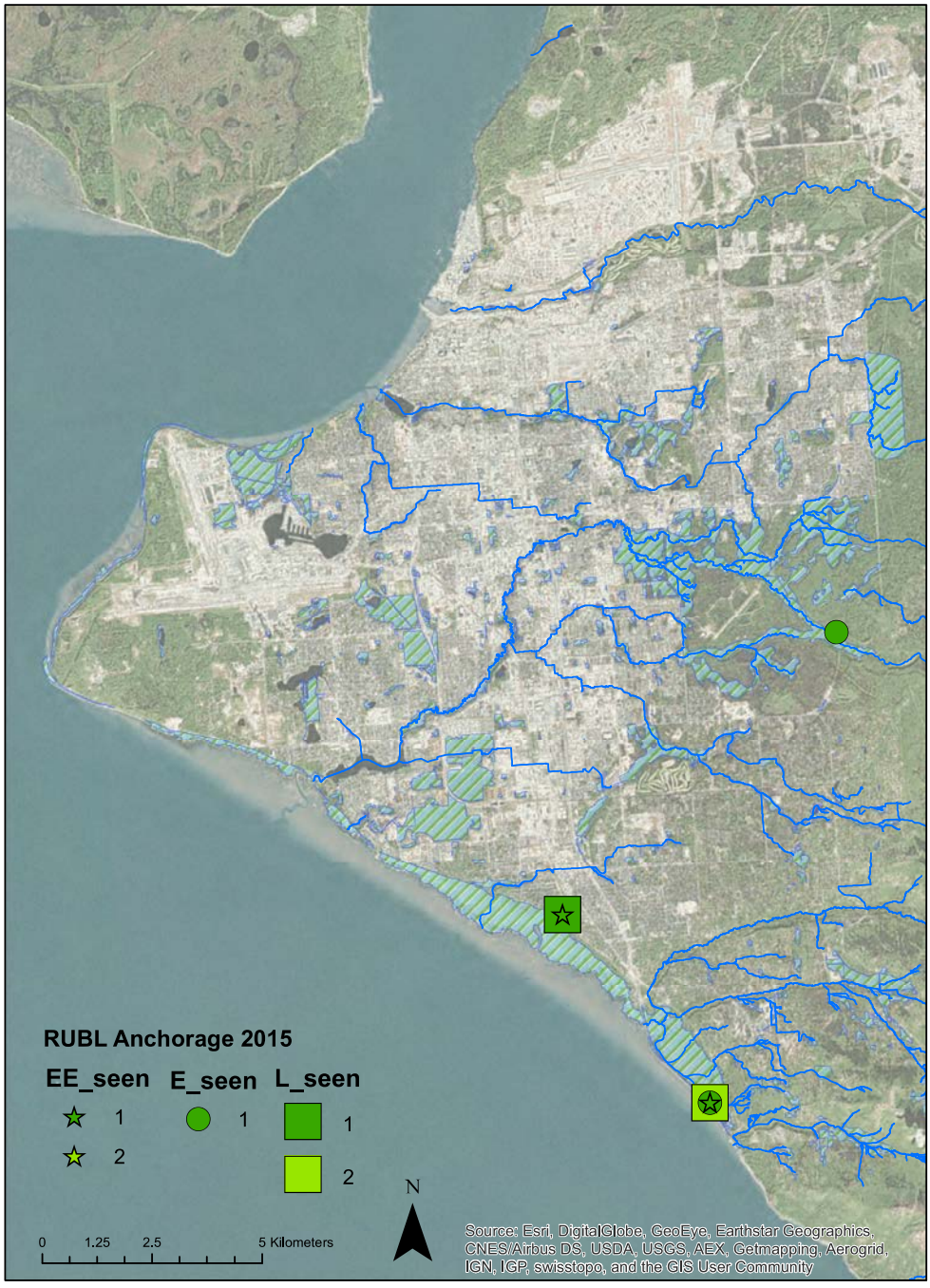


Figure 7. Tree Swallow observations in the Anchorage Bowl in 2015.

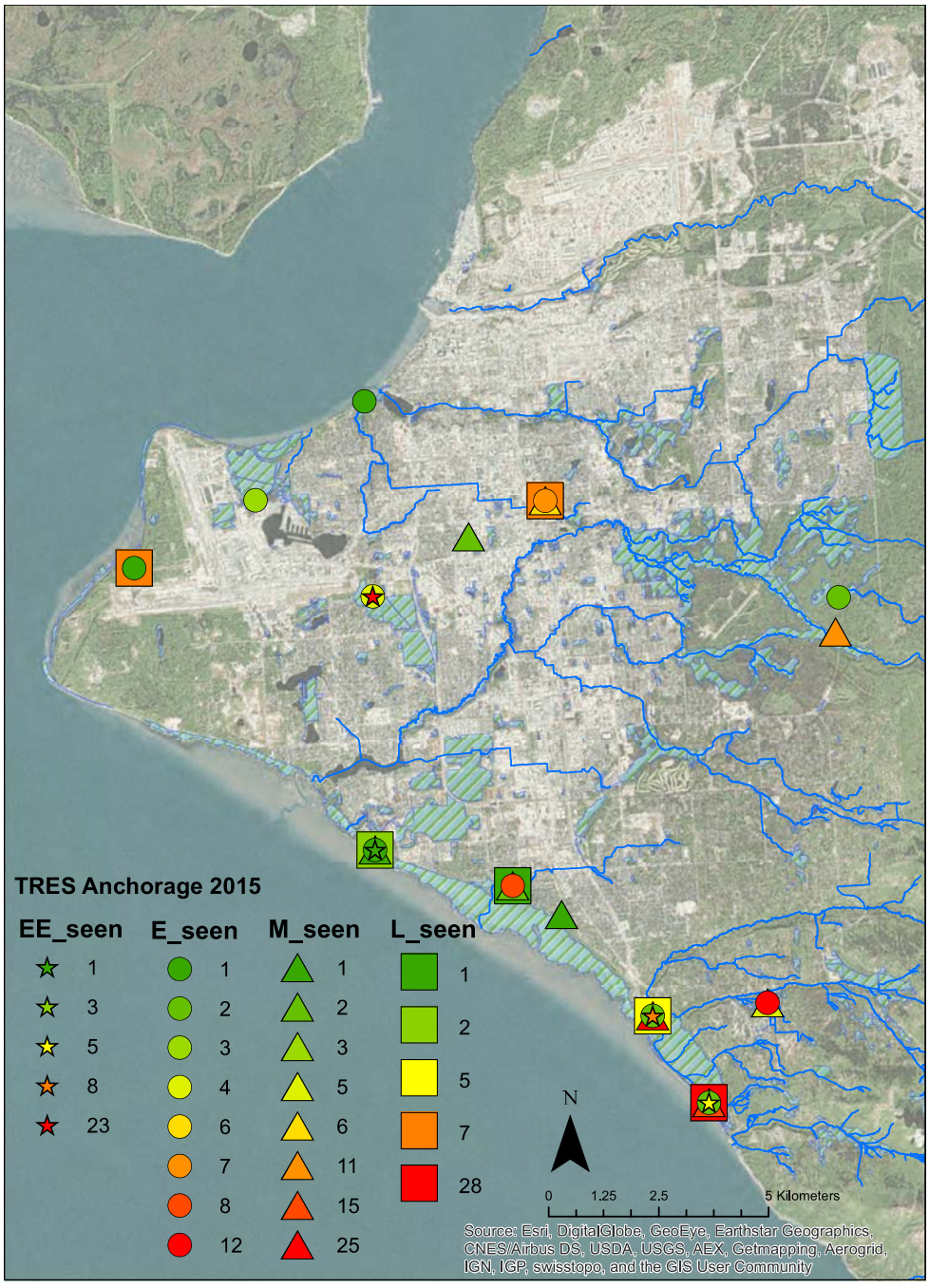


Figure 8. Violet-green Swallow observations in the Anchorage Bowl in 2015.

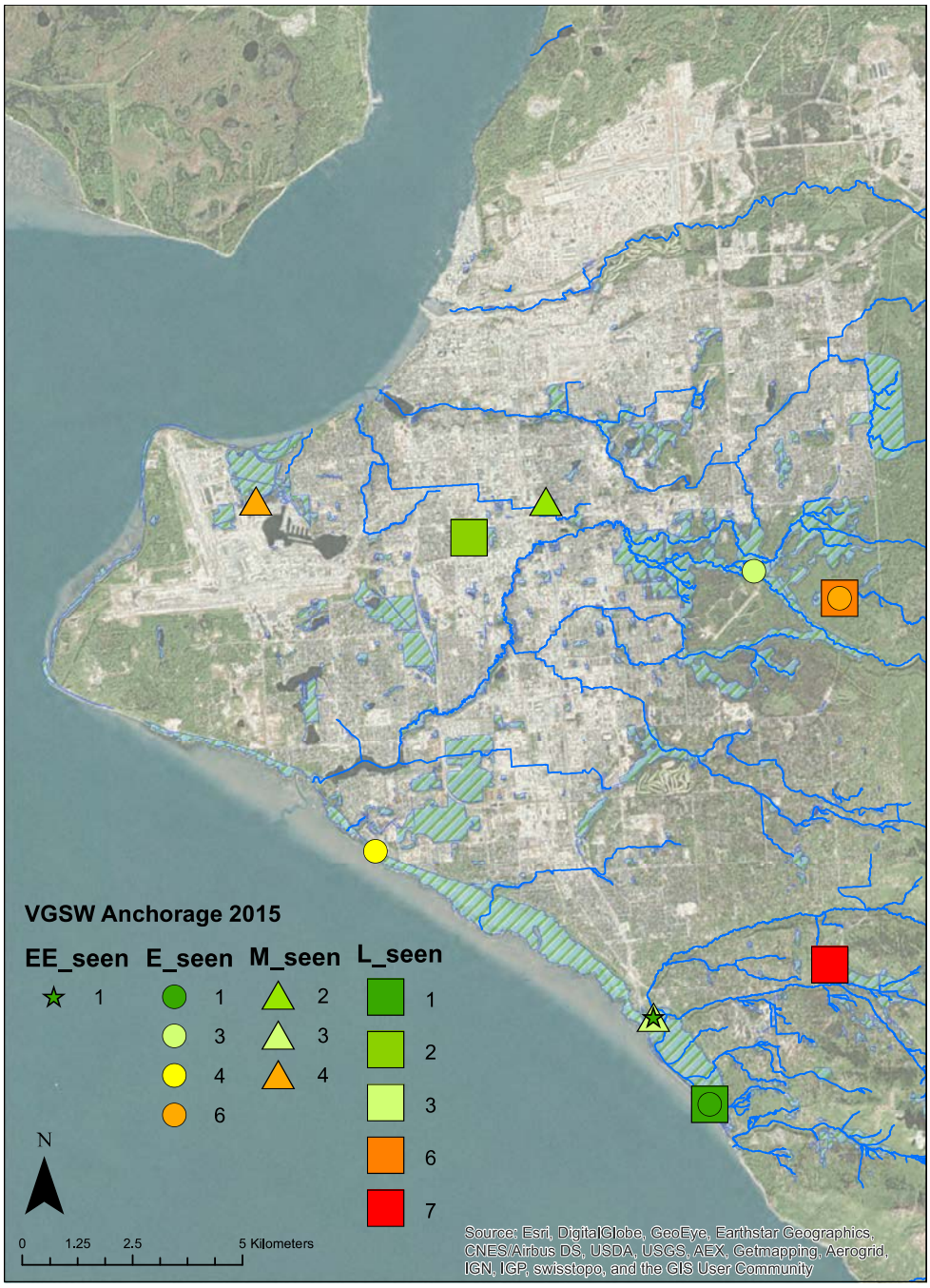


Figure 9. Lesser Yellowlegs observations in the Matanuska Valley in 2015.

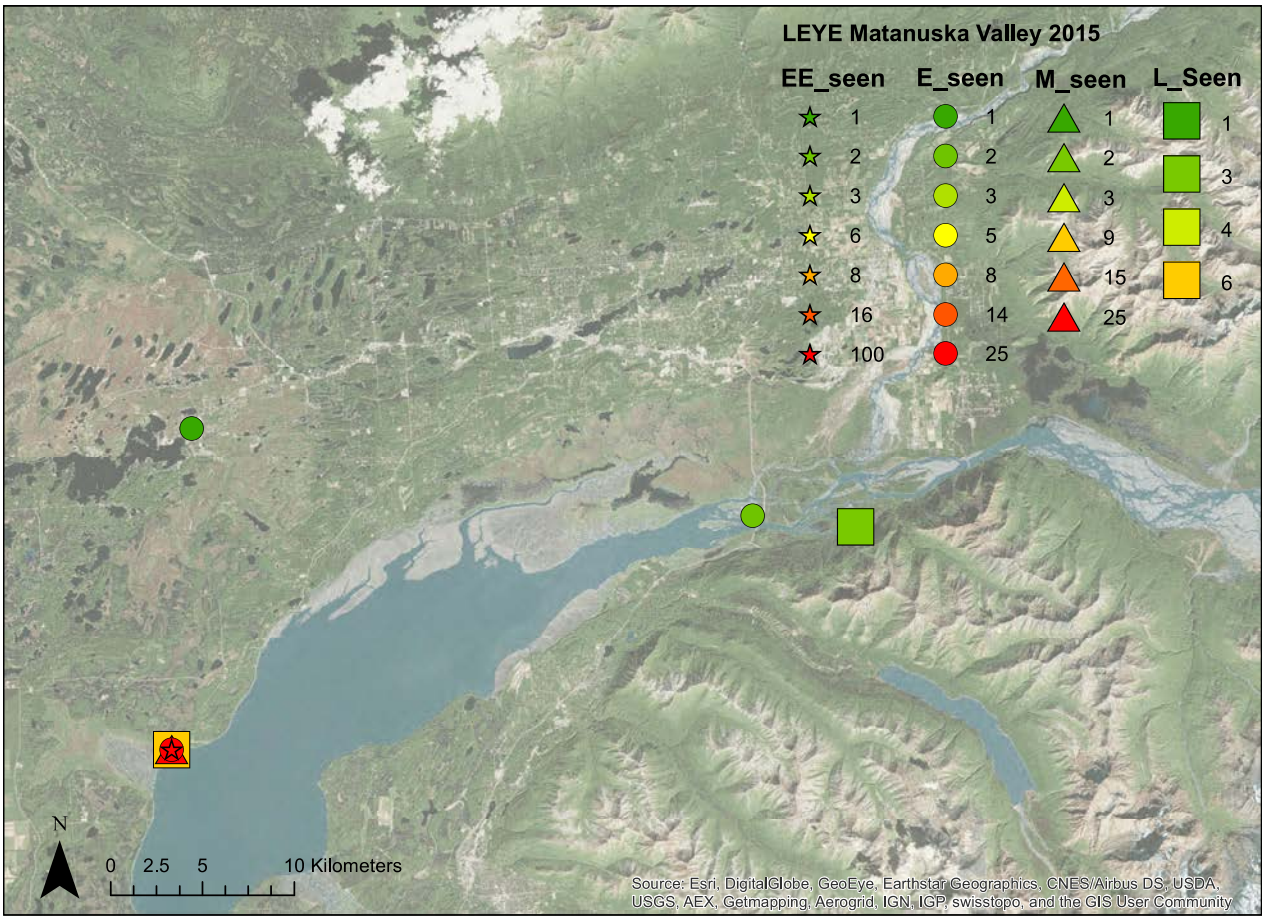


Figure 10. Greater Yellowlegs observations in the Matanuska Valley in 2015.

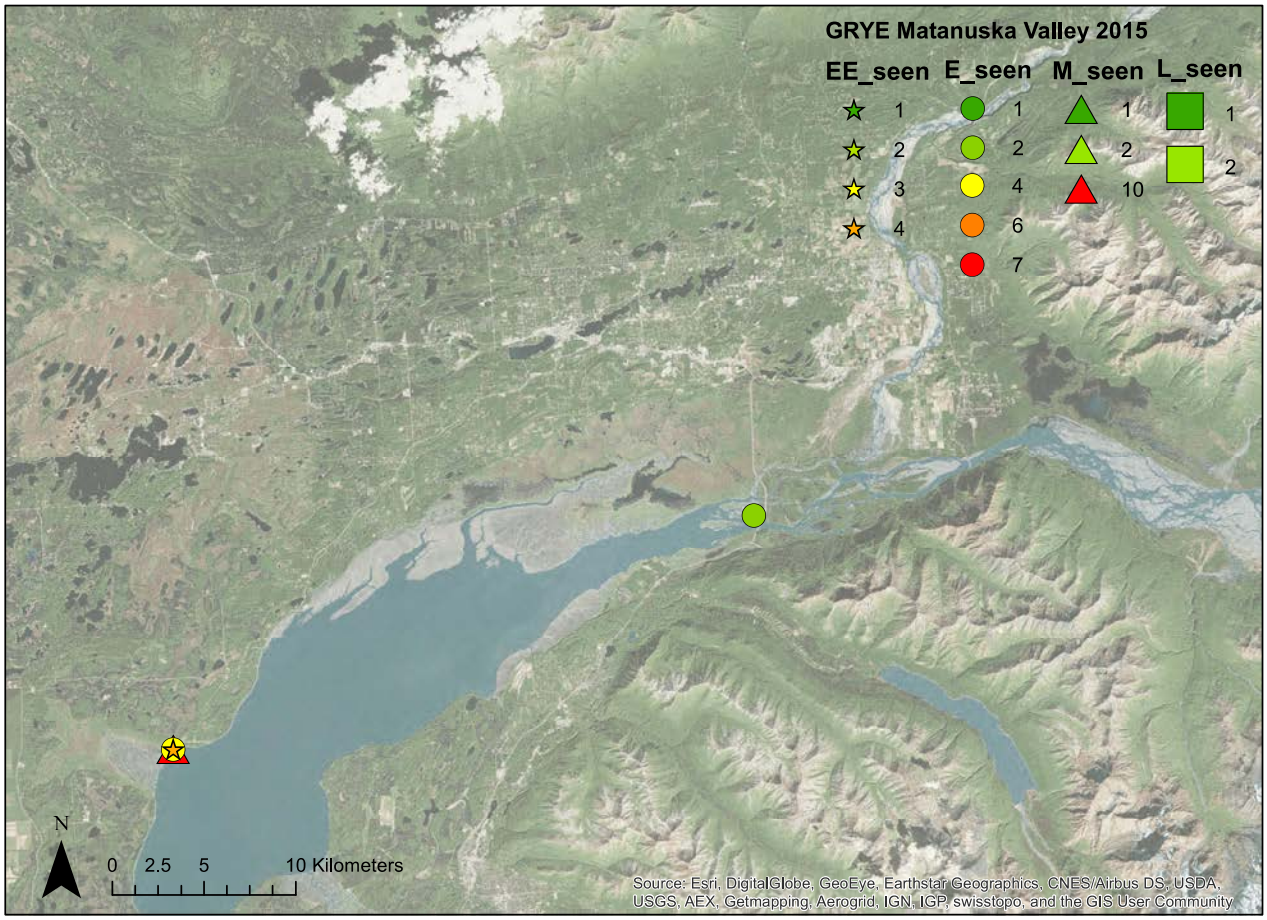


Figure 11. Rusty Blackbird observations in the Matanuska Valley in 2015.

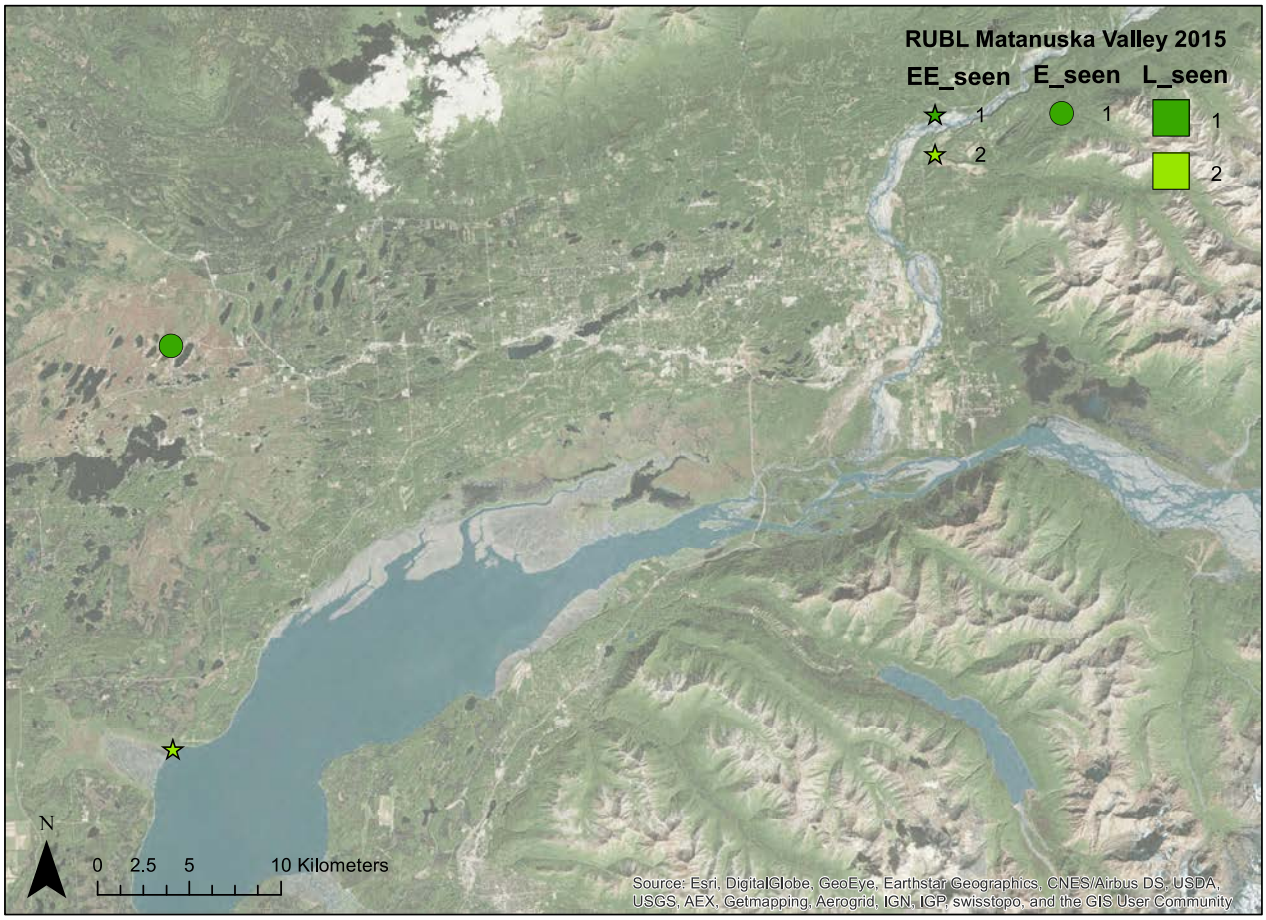


Figure 12. Tree Swallow observations in the Matanuska Valley in 2015.

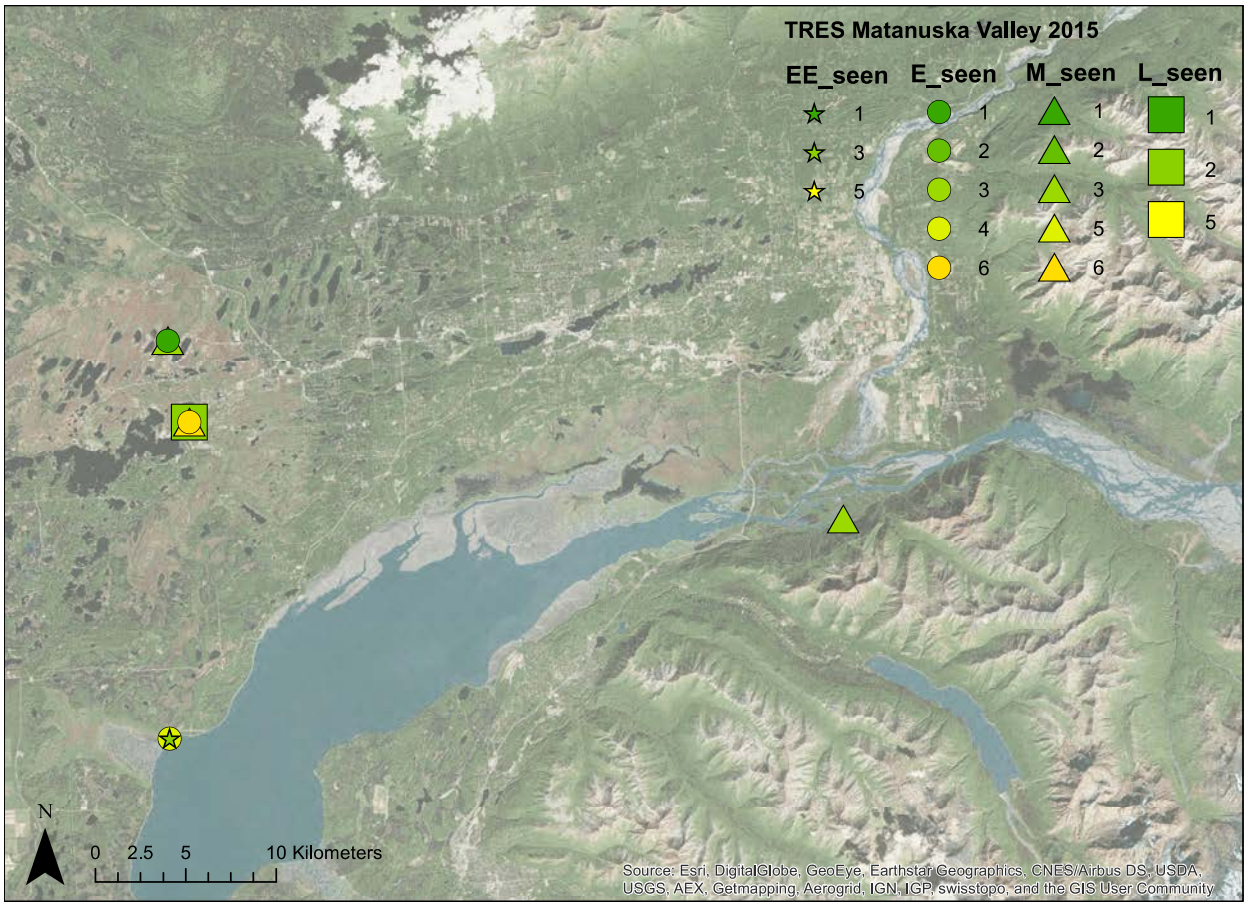
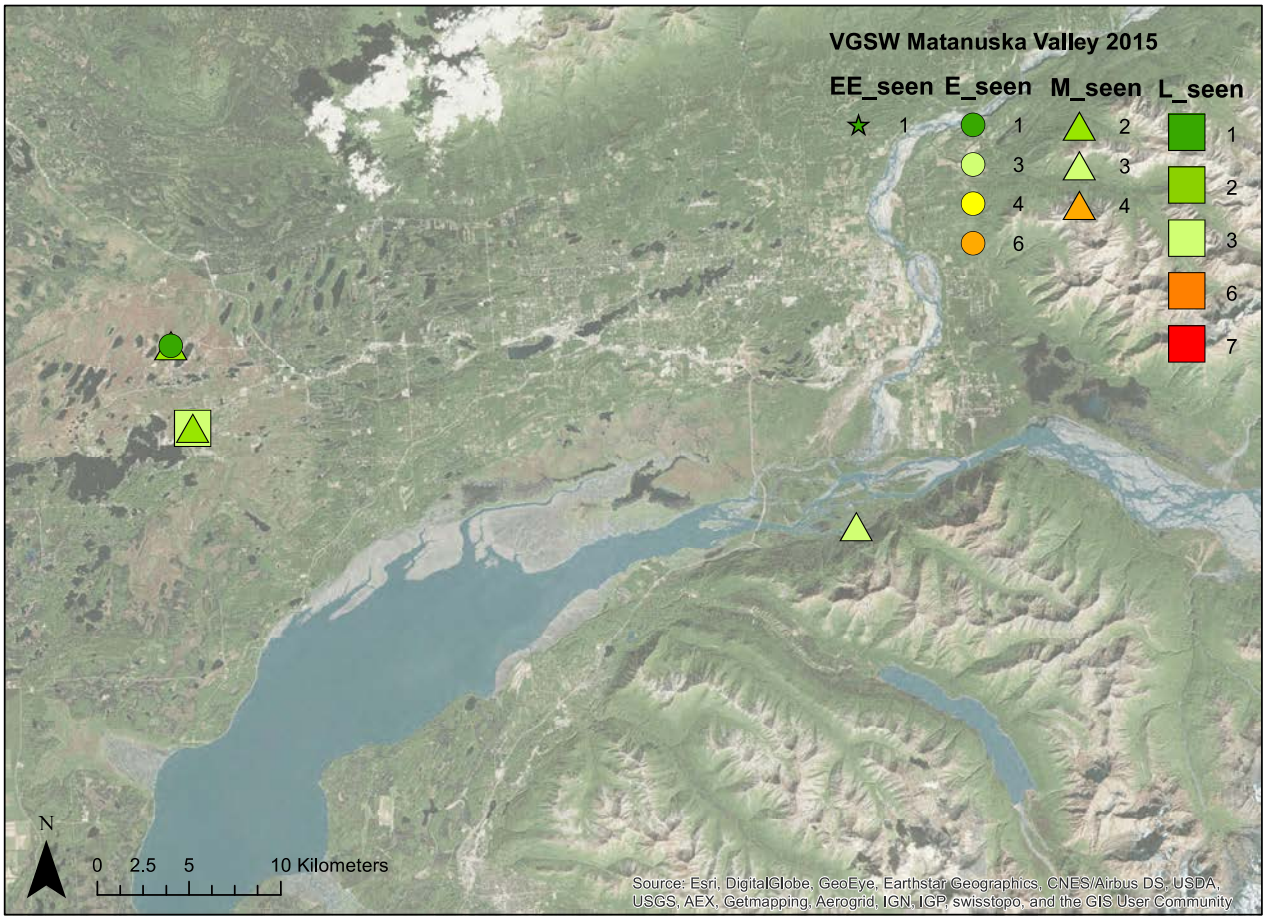


Figure 13. Violet-green Swallow observations in the Matanuska Valley in 2015.



Appendix 1. Changes to 2015 site names for eBird designation. eBird site names will be used henceforth for the Birds 'n' Bogs project.

eBird Site Name	2015 Site Name
ANCHORAGE	
Connors Lake	Connors Bog
Waldron Pond	Waldron Lake
Johns Park	Anchorage Coastal Wildlife Refuge North/West
Oceanview Bluff Park	Anchorage Coastal Wildlife Refuge South/East
Coastal Trail - Chester Creek to Fish Creek	Westchester West
Storck Park	Bear Valley
Lake Hood Drive & Helio Place Intersection	Moose Alley
Earthquake Park	Coastal Trail
Detox Center–Recycling Facility Anchorage Int. Airport	Clitheroe
MATANUSKA VALLEY	
Palmer Hay Flats SGR– Rabbit Slough Access Rd	Rabbit Slough Parking and Access area
Goose Bay SGR	Goose Bay
Eklutna Power Plant Tailrace– Old Glenn Highway	Eklutna Power Plant
Palmer Hay Flats SGR– Reflections Lake	Reflections Lake
Old Matanuska Townsite	Matanuska Townsite Road
Wasilla–Finger Lake Campground	Finger Lake Campground
Pond east of 49th State Street	Pond along 49th State Street

Appendix 2. Additional bird species observed in 2015.

Common Name	Scientific Name
Greater White-fronted Goose	*Anser albifrons*
Snow Goose	*Chen caerulescens*
Canada Goose	*Branta canadensis*
Trumpeter Swan	*Cygnus buccinator*
Gadwall	*Anas strepera*
American Wigeon	*Anas americana*
Mallard	*Anas platyrhynchos*
Northern Shoveler	*Anas clypeata*
Northern Pintail	*Anas acuta*
Green-winged Teal	*Anas crecca*
Ring-necked Duck	*Aythya collaris*
Greater Scaup	*Aythya marila*
Lesser Scaup	*Aythya affinis*
King Eider	*Somateria spectabilis*
Barrow's Goldeneye	*Bucephala islandica*
Hooded Merganser	*Lophodytes cucullatus*
Common Merganser	*Mergus merganser*
Common Loon	*Gavia immer*
Red-necked Grebe	*Podiceps grisegena*
Bald Eagle	*Haliaeetus leucocephalus*
Northern Harrier	*Circus cyaneus*
Northern Goshawk	*Accipiter gentilis*
Red-tailed Hawk	*Buteo jamaicensis*
Golden Eagle	*Aquila chrysaetos*
Sandhill Crane	*Grus canadensis*
Semipalmated Plover	*Charadrius semipalmatus*
Spotted Sandpiper	*Actitis macularius*

Common Name	Scientific Name
Hudsonian Godwit	*Limosa haemastica*
Least Sandpiper	*Calidris minutilla*
Semipalmated Sandpiper	*Calidris pusilla*
Western Sandpiper	*Calidris mauri*
Short-billed Dowitcher	*Limnodromus griseus*
Long-billed Dowitcher	*Limnodromus scolopaceus*
Wilson's Snipe	*Gallinago delicata*
Red-necked Phalarope	*Phalaropus lobatus*
Bonaparte's Gull	*Chroicocephalus philadelphia*
Mew Gull	*Larus canus*
Herring Gull	*Larus argentatus*
Glaucous-winged Gull	*Larus glaucescens*
Arctic Tern	*Sterna paradisaea*
Belted Kingfisher	*Megaceryle alcyon*
Downy Woodpecker	*Picoides pubescens*
Hairy Woodpecker	*Picoides villosus*
Northern Flicker	*Colaptes auratus*
Western Wood-Pewee	*Contopus sordidulus*
Gray Jay	*Perisoreus canadensis*
Steller's Jay	*Cyanocitta stelleri*
Black-billed Magpie	*Pica hudsonia*
Common Raven	*Corvus corax*
Cliff Swallow	*Petrochelidon pyrrhonota*
Black-capped Chickadee	*Poecile atricapillus*
Boreal Chickadee	*Poecile hudsonicus*
Red-breasted Nuthatch	*Sitta canadensis*
Golden-crowned Kinglet	*Regulus satrapa*
Ruby-crowned Kinglet	*Regulus calendula*
Swainson's Thrush	*Catharus ustulatus*

Common Name	Scientific Name
Hermit Thrush	*Catharus guttatus*
American Robin	*Turdus migratorius*
Varied Thrush	*Ixoreus naevius*
Northern Waterthrush	*Parkesia noveboracensis*
Orange-crowned Warbler	*Oreothlypis celata*
Yellow Warbler	*Setophaga petechia*
Yellow-rumped Warbler	*Setophaga coronata*
Townsend's Warbler	*Setophaga townsendi*
Wilson's Warbler	*Cardellina pusilla*
American Tree Sparrow	*Spizella arborea*
Savannah Sparrow	*Passerculus sandwichensis*
Fox Sparrow	*Passerella iliaca*
Lincoln's Sparrow	*Melospiza lincolnii*
Harris's Sparrow	*Zonotrichia querula*
White-crowned Sparrow	*Zonotrichia leucophrys*
Golden-crowned Sparrow	*Zonotrichia atricapilla*
Dark-eyed Junco	*Junco hyemalis*
White-winged Crossbill	*Loxia leucoptera*
Common Redpoll	*Acanthis flammea*
Eurasian Siskin	*Spinus spinus*
Pine Siskin	*Spinus pinus*