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THE TRICOLORED BLACKBIRD IN WASHINGTON STATE: FIRST ASSESSMENT OF STATUS AND DISTRIBUTION

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ABSTRACT: Breeding of the Tricolored Blackbird (*Agelaius tricolor*) in Washington State was first reported in 1998, but since then the species' status and population trends have been poorly documented. I reviewed available data and found reliable reports of breeding at six locations, all in the Columbia Basin ecoregion, and additional reports of nonbreeding birds in 11 counties statewide. Breeding colonies were small, averaging 34 birds. All colonies were in emergent vegetation, and birds moved among them over the 24 years covered by this assessment. The relatively arid environment of the Columbia Basin, the limited extent of wetlands suitable for nesting, and the intensification of agriculture, implying a reduction in insect populations, likely inhibit the expansion of the Tricolored Blackbird's range in Washington. A systematic survey of known and suitable breeding locations within the Columbia Basin ecoregion, more intensive monitoring of colonies during the breeding season, an assessment of foraging habitats, and a review of the Tricolored Blackbird in the Washington State Wildlife Action Plan for 2025 should be the next steps in assessing the status and trends of the species.

On 5 July 1998 a flock of at least 30, and possibly 50, Tricolored Blackbirds (*Agelaius tricolor*) was reported from Wilson Creek, a town east of the city of Soap Lake, Grant County, Washington, representing the species' first occurrence accepted by the Washington Bird Records Committee (Tweit and Tice 1998, Aanerud and Mattocks 2000). Subsequently the Tricolored Blackbird has been considered rare in Washington, with regular reports concentrated in the southeastern part of the state. In 2006 the committee removed the Tricolored Blackbird from the list of species it reviews (https://wos.org/records/checklist/).

Despite its presence in the state for nearly 25 years, little has been written about the Tricolored Blackbird in Washington. Wahl et al. (2005) briefly described what was known about the species following its original detection and suggested that its appearance in Washington may have been part of a wider range expansion into the Pacific Northwest, including a spread into northern Oregon. Bell and Kennedy (2006) mentioned its occurrence in the

Columbia Basin and Vancouver lowlands. Aversa et al. (2020) described it as an intermittent breeder east of the Cascades in central and southeastern Washington from Grant to Whitman counties.

Because the Tricolored Blackbird is nearly endemic to California, home to over 98% of the population, most research has been focused there (Beedy et al. 2018). However, the species has also been reported nesting from a unique location in Nevada (Ammon and Woods 2008), at scattered sites in Oregon (Marshall et al. 2003, Denny and Denny 2007), and in Baja California, Mexico, where Erickson et al. (2021) reviewed its near extirpation.

Because of the steep decline in abundance in California (Meese 2013), there is concern about the species' ability to persist in Washington, where it has no official conservation status (J. Fidorra pers. comm.). Despite the frequent and regular observations of the Tricolored Blackbird over the past 24 years, there has been neither systematic study nor publication of a review of its status and trends in Washington. Beedy et al. (2018) recommended review of small breeding populations at locations outside of California, including Washington.

Here I review and summarize existing data and literature on the occurrence and abundance of the Tricolored Blackbird in Washington, update the species' status at the northern limit of its range, and recommend next steps in efforts to monitor the size and distribution of the population.

CONTRASTS OF CALIFORNIA AND WASHINGTON HABITATS OF THE TRICOLORED BLACKBIRD

"The outstanding characteristic of the tricolored redwing is its highly gregarious behavior at all times, the density of its nesting colonies, the immensity of its flocks, and its social habit" (Neff 1937). Neff was writing during a period of abundance for the Tricolored Blackbird, and his sentence reflects its evolution in California as a colonial nesting bird suited to exploit the brief period in which emergent vegetation and insects are temporarily abundant. The species developed the habit of synchronous nest construction and egg laying within a colony, followed by 14 days of feeding, allowing the cycle to be completed in 45–48 days (Payne 1969). Hamilton (1998) described the tricolor as an itinerant breeder, birds moving to a new location to nest for a second time in one breeding season.

Severe reductions in the Central Valley's once vast wetlands (Frayer et al. 1989) have led the Tricolored Blackbird to attempt to breed in novel substrates including irrigated weedy fields in which the principal crop is triticale, a hybrid of wheat and rye grown for silage for cattle. It also nests regularly in certain introduced Eurasian weeds including the Himalayan blackberry (*Rubus bifrons* or *armeniacus*), cheeseweed mallow (*Malva parviflora*), mustards (*Brassica* spp.), and milk thistle (*Silybum marianum*), as well as the native stinging nettle (*Urtica dioica*) and willows (*Salix* spp.) (Beedy et al. 2018).

In Washington the Tricolored Blackbird inhabits a landscape differing from the Central Valley of California: the Columbia Basin ecoregion, an arid area spanning part or all of 15 counties in southeastern Washington (Figure 1). The Columbia Basin is an extension of the high desert of the Great Basin characterized by low rainfall, hot summers, and cold winters,

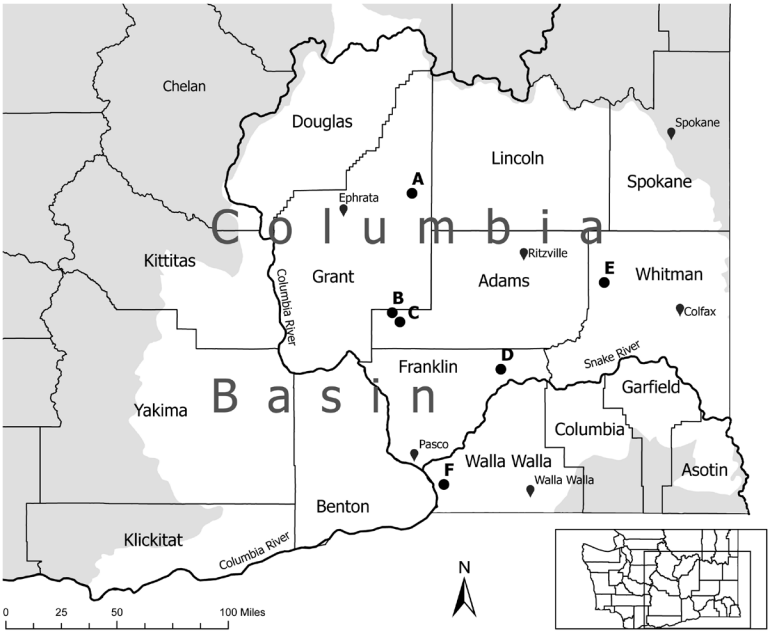

FIGURE 1. Locations of confirmed nesting colonies of the Tricolored Blackbird in Washington. (•) Breeding locations: (A) Wilson Creek, (B) Columbia NWR, (C) Othello, (D) Kahlotus/Harder Spring, (E) Texas Lake, (F) Iowa Dodd. See Table 1 for data related to each location.

native grasses, and shrub-steppe habitat. When the Tricolored Blackbird first colonized Washington in 1998, it occupied wetlands created during the development of the Columbia Basin Project (https://www.usbr.gov/projects/index.php?id=438). Since the 1950s the U. S. Fish and Wildlife Service has managed water distribution through the Columbia National Wildlife Refuge and the Bureau of Reclamation has provided water for irrigation for farming in the Columbia River region. This supplemental water has raised the water table, resulting in the creation of wetland habitats where there had been none (Orians and Horn 1969). In addition, continuing management of these wetlands and the emergent vegetation they provide has created an environment suitable for breeding by many bird species, including blackbirds (Creighton et al. 1997). Without water subsidies in this region the area would not support any species of blackbird (Orians pers. comm.). Thus active management of resources and water subsidies have provided some nesting habitat for the Tricolored Blackbird in Washington. The areas in which Tricolored Blackbirds forage in Washington have not been documented.

Receiving <300 mm of rain per year, the Columbia Basin ecosystem was primitively a landscape of native grassland and shrub-steppe. By 1996, however, 60% of the region had been converted to agriculture (Dobler et

al. 1996). In unirrigated areas farmers plant a rain-fed crop of winter wheat (Schillinger 2020). In most irrigated areas in the region, center-pivot irrigation equipment is used to grow potatoes, vegetables, fruits, and hops. Peterson and Cooper (1987) found this type of irrigation disruptive to nesting birds. I find no reports of the Tricolored Blackbird nesting in fields of any crop in Washington. The small amount of triticale grown in Washington is a winter variety that is harvested in early spring (Schillinger 2020) and so unavailable as a nesting substrate for the tricolor.

Little is known about the Tricolored Blackbird's occurrence in Washington in winter, though a grain-storage facility in Adams County is a known location for winter feeding. Feedlots for cattle may also provide the tricolor with opportunities for feeding similar to those it exploits in winter in California (Beedy et al. 2018).

METHODS

I searched for information on the Tricolored Blackbird through July 2021. Sources included

- Reports to https://eBird.org. My download of data from eBird in July 2021 yielded 1333 records of observations of the Tricolored Blackbird in Washington. These data included separate listings for many parties on a checklist, creating duplicate records. The data also included records in which the species was noted as present but lacking a count or estimate of the number of birds observed. Previous research on the tricolor using eBird data dropped these reports prior to analysis (Robinson et al. 2021), and I followed that protocol. Removing duplicates (n = 380) and records with no count of birds (n = 55) left 898 usable eBird records.
- The quarterly summaries in the journal *North American Birds* and its predecessor *National Audubon Society Field Notes* for the 21 years from 1998 to 2019 (reports from 2020 and 2021 were not published at the time of my analysis). There were no mentions of the Tricolored Blackbird in Washington in *North American Birds* after March 2014.
- The quarterly Field Notes in the *WOS News*, the newsletter of the Washington Ornithological Society, for the same period.
- The archives of the "Tweeters" list-serve hosted by the society, which provided two useful reports. Pooling the data and eliminating duplicates from these last three sources yielded an additional 156 unique observation records.
- The National Audubon Society's Christmas Bird Count (http://www.christmasbirdcount.org), which yielded two records.
- Articles in the literature cited on the Tricolored Blackbird Portal hosted by the University of California, Davis (https://tricolor.ice.ucdavis.edu/).
- Personal communication with local experts with intimate knowledge of the tricolor in Washington.

Also,

- Reports to https://www.inaturalist.org/. These numbered 24 from May 2017 to April 2021 but contained no information on breeding so I did not use them further.

- Reports from 11 routes of the U.S. Geological Survey's Breeding Bird Survey in Washington and the Washington Regional Summary Report (https://www.mbr-pwrc.usgs.gov) do not mention the Tricolored Blackbird.
- Washington's breeding bird atlas (Smith et al. 1997) does not cover the species.
- The database of museum specimens and recordings at http://www.vertnet.org/ includes no records from Washington.

To allow for comparisons with data from California I adopted the definitions used by Beedy et al. (1991). A breeding colony is defined as a group of Tricolored Blackbirds nesting together at a location separated by at least 0.5 mile from any other group. Colonies are defined as large (>2000 birds), small (30–2000 birds), or very small (<30 birds). Breeding was confirmed by observations such as "carrying food, carrying nesting material, fresh nest with eggs, incubation, feeding young, or fledgling behavior" (Beedy et al. 1991:9).

Also, following Beedy et al. (1991) I compiled the date of observation, the number of tricolors observed, and, if known, the nesting habitat or substrate, the fate of the colony, and the current suitability of the habitat for nesting.

I considered breeding probable when seven or more singing males, pairs in suitable habitat, courtship behavior, or nest building was reported, and breeding possible when pairs or singing males in suitable habitat were reported (Smith et al. 1997). Singing may not be a reliable indicator of breeding as, up to two months before settling at a colony, male Tricolored Blackbirds may sing at a location where they do not remain to breed (Payne 1969). Therefore, I included in this analysis only locations where I obtained evidence of probable or confirmed breeding.

Habitat suitable for breeding Tricolored Blackbirds is characterized by "(1) a protected substrate in flooded, thorny, or spiny vegetation; (2) an open accessible source of water for drinking and bathing; and (3) a suitable foraging space providing insect prey" (Meese and Beedy 2015:81). Customarily, Tricolors nest in emergent cattails (*Typha latifolia*) and bulrushes (*Schoenoplectus californicus*) in freshwater marshes. From 30 March to 14 July 2021 Carol Carlson-Ray and I visited all six locations of known breeding at least once (Othello three times) and used these criteria to assess their current suitability for nesting Tricolored Blackbirds.

I ran the descriptive and frequency statistics in the free online software Jamovi 1.6.23. The map was generated with ArcGIS Pro (ESRI, Redlands, CA) (Figure 1).

RESULTS

Observers reported the Tricolored Blackbird every year from 1998 to 2021 and in every month of the year in 11 counties in Washington. Ten of these counties are in the Columbia Basin; one, Clark County, is in southwest Washington. But I found reports of Tricolored Blackbirds breeding at only six locations in five counties within the Columbia Basin ecoregion, all in emergent vegetation.

Observation Records

Of the 1054 records of the Tricolored Blackbird in Washington, from eBird, *North American Birds*, WOS News Field Notes, and Tweeters pooled, 983 (93.3%) were in the five counties where I found evidence of breeding (Table 1). Among these records were 30 (3.1%) that included evidence of probable or confirmed breeding (range 1–9 reports per breeding location). Of these 30 reports, 15 (50%) are for very small colonies (range 2–25 birds) and 15 (50%) are for small colonies of 30 to 318 birds. There were no large colonies of more than 2000 birds. The average colony size of 34 birds is skewed upward by the exceptionally large (for Washington) colony of 318 birds at Texas Lake in 2005. Dropping this colony from the calculation reduces the average colony size to 25.

The evidence of breeding observers most often noted was the presence of young birds and adults carrying food and/or feeding young. I found no reports that specified eggs in nests or numbers of nests, nor reports in which the observer attempted to distinguish the number of breeding from non-breeding birds in the colony.

Among the five counties where I found evidence of breeding, nearly half of all 898 eBird checklists posted were from Adams County, and more than a quarter were from Walla Walla County. Reports from Grant, Whitman, and Franklin counties were fewer (Table 2). Over half of all reports via eBird were in spring (March–May). Of the 898 eBird checklists, 381 (42.4%) specified one or two birds, 446 (49.6%) specified 3–29 birds, and 71 (7.9%) specified 30 or more birds. Only 166 (18%) included information on the birds' age or sex.

Two reports via eBird precede Washington's first accepted record in 1998. The Washington Bird Records Committee reviewed both reports but did not accept them. The first was of a single bird at Long Beach, Pacific County, on 30 April 1984; the second was of three in Wallula, Walla Walla County, on 13 April 1990.

Locations of the Tricolored Blackbird Breeding in Washington

Reports imply that Tricolored Blackbirds have nested in six freshwater marshes within the Columbia Basin (Table 3, Figure 1). All colonies were in cattails. Five of the six are on private property with no public access. The Kahlotus/Harder Spring location in Franklin County is the site where successful breeding has been noted most recently, and it remains suitable. Othello and the Columbia National Wildlife Refuge, two other locations of recent breeding in Adams County, also appear to remain suitable for breeding. Texas Lake, Whitman County, hosted 318 tricolors in 2005, representing Washington's largest colony. It appears to provide suitable habitat, but there has been no additional evidence of breeding there. The colony at Wilson Creek, Grant County, was the first found in Washington and is known to have been productive through 2008. However, its current suitability for breeding is unknown. The Iowa Dodd location has had the smallest breeding colonies, and its current suitability is unknown partly because of the conversion of a portion of the wetland for cattle raising.

Five of the eBird checklists mentioned Tricolored Blackbirds foraging in irrigated agricultural fields near the colonies at Othello and Kahlotus/

Table 1 Chronological List of Evidence of Breeding of the Tricolored Blackbird in Washington

Year and location[a]	County	Date	No. birds[b]	Evidence of breeding	Quality of evidence	Source[c]
1998						
Wilson Creek	Grant	5 Jul	30	Remained until July 25	Probable	NASFN
		8 Jul	30	Adults carrying food	Confirmed	Tweeters
		10 Jul	10	One male carrying food One juvenile present	Confirmed	Tweeters
2000						
Wilson Creek	Grant	8 Jun	25	Young present	Confirmed	WOSFN
2002						
Wilson Creek	Grant	12 Apr	30	Colony site	Probable	NAB, WOSFN
2003						
Wilson Creek	Grant	17 May	10	Pairs in suitable habitat	Probable	NAB, WOSFN
2005						
Texas Lake	Whitman	5 May	318	Recently fledged young	Confirmed	eBird, NAB
2006						
Othello	Adams	15 Jul	6	One begging juvenile	Confirmed	NAB, WOSFN
2007						
Othello	Adams	5 Jun	6	Carrying Food	Confirmed	NAB, WOSFN
2008						
Wilson Creek	Grant	4 Jun	6	Several pairs observed to June 14	Probable	NAB
2013						
Othello	Adams	19 Jun	30	Recently fledged young	Confirmed	eBird, NAB
		5 Jul	4	Three young present	Confirmed	eBird
2014						
Othello	Adams	1 Aug	2	One begging juvenile	Confirmed	eBird
2016						
Columbia NWR	Adams	28 May	50	50 males in colony sighted	Probable	eBird
		29 May	10	Adults carrying food	Confirmed	eBird
		8 Jun	30	Breeding colony sighted	Probable	eBird
Iowa Dodd	Walla Walla	2 Jun	8	Nesting reported	Probable	eBird
		25 Jun	12	Young heard begging	Confirmed	eBird
2017						
Othello	Adams	5 Jun	55	Pairs in suitable habitat	Probable	eBird
Iowa Dodd	Walla Walla	29 Jun	8	5 male, 1 female, 3 young heard begging	Confirmed	eBird
		8 Jul	7	Young heard begging	Confirmed	eBird
2018						
Columbia NWR	Adams	9 May	50	Carrying nesting materials	Confirmed	eBird
		26 May	50	Females carrying food	Confirmed	eBird
		30 May	10	Carrying food	Confirmed	eBird
Kahlotus/Harder	Franklin	19 Jul	36	Colony observed	Probable	eBird
2019						
Kahlotus/Harder	Franklin	12 Apr	75	Colony observed	Probable	eBird
2020						
Kahlotus/Harder	Franklin	3 Jul	36	Colony observed	Probable	eBird
2021						
Kahlotus/Harder	Franklin	18 May	40	Multiple singing males	Probable	eBird
		8 Jul	15	2 females carrying food	Confirmed	eBird
		9 Jul	30	Adults feeding young	Confirmed	eBird

[a]No probable or confirmed evidence of breeding was found in the missing years.
[b]Current data is insufficient to report birds by age and sex. Some detail is available in the adjacent Evidence of Breeding column.
[c]NASFN, *National Audubon Society Field Notes*; NAB, *North American Birds*; Tweeters, list-serve hosted by the University of Washington; WOSFN, *WOSNews* Field Notes; eBird, https://ebird.org.

Table 2 Frequency of Washington Reports of the Tricolored Blackbird to eBird by County and Season[a]

County	Spring	Summer	Fall	Winter	Total	Percent
Adams[b]	282	125	8	10	425	47.3%
Clark	0	0	4	4	8	0.9%
Douglas	0	1	0	0	1	0.1%
Franklin[b]	9	25	0	0	34	3.8%
Grant[b]	46	44	1	1	92	10.2%
Klickitat	1	0	0	1	2	0.2%
Lincoln	30	7	1	1	39	4.3%
Spokane	2	0	0	0	2	0.2%
Walla Walla[b]	79	72	22	83	256	28.5%
Whitman[b]	22	9	4	0	35	3.9%
Yakima	2	1	1	0	4	0.4%
Total	473	284	41	100	898	
Percent	53%	32%	5%	11%		

[a]Spring, Mar–May; summer, Jun–Aug; fall, Sep–Nov; winter, Dec–Feb.
[b]County with evidence of breeding.

Harder Spring. There were no reports of tricolors foraging in grasslands or shrub-steppe habitats. One report from Othello noted birds flycatching close to a pond.

As there has been no study of the Tricolored Blackbird in Washington tracking individuals, there is no information regarding itinerant breeding in the state. Itinerant breeding may not be usual for all tricolors; for example, Erickson et al. (2021) found no itinerant breeding in Mexico.

Wintering and Nonbreeding Tricolored Blackbirds in Washington

Christmas Bird Counts for Washington through 2020 have reported the Tricolored Blackbird only twice: one bird in the Columbia Hills circle, Klickitat County, in 2009, and three at Moses Lake, Grant County, in 2010. Thirteen of the 100 winter eBird checklists recording the species mentioned the birds feeding at the grain-storage facility in Othello. I contacted 10 observ-

Table 3 Locations of Tricolored Blackbird Colonies in Washington

Location	County	Years known active	Number of reports of evidence[a]	Number of breeding birds[b]	Current condition
Wilson Creek	Grant	1998–2008	7	20	Unknown
Texas Lake	Whitman	2005	1	318	Suitable
Othello	Adams	2006–2017	6	17	Suitable
Iowa Dodd	Walla Walla	2016–2017	4	9	Unknown
Columbia NWR	Adams	2016–2018	6	33	Suitable
Kahlotus/Harder	Franklin	2018–2021	6	39	Suitable

[a]Number of reports providing evidence of probable or confirmed breeding. Breeding not confirmed in all years a colony was occupied.
[b]Average number of birds in colony on the basis of data from eBird, *North American Birds*, Tweeters, and WOSFN. Current data are insufficient to report birds by age and sex.

Table 4 Distribution by County of Observations Reported via eBird of Nonbreeding Tricolored Blackbirds in Washington

County	Number of observations	Mean count	Range of counts
Adams[a]	415	11.5	1–253
Walla Walla[a]	252	3.9	1–30
Grant[a]	85	6.4	1–50
Lincoln	39	13.9	1–300
Whitman[a]	34	5.1	1–300
Franklin[a]	28	22	1–80
Clark	8	2.3	1–3
Yakima	4	1.3	1–2
Klickitat	2	1.5	1–2
Spokane	2	1	1
Douglas	1	1	1
Total	877		

[a]County in which the Tricolored Blackbird has nested.

ers of flocks reported in March and April, and all of them described the birds as "wintering" in nonbreeding flocks. Carol Carlson-Ray and I witnessed Tricolored Blackbirds in a mixed flock of blackbirds feeding on spilled grain along the road by this facility in March 2021.

Nonbreeding Tricolored Blackbirds have been observed in 11 counties (Table 4), a distribution similar to that of the total records. Notably, in Lincoln County, among 39 eBird checklists, some observers reported possible breeding, but these reports lacked details indicating probable or confirmed breeding. In Clark County reports of immature males during winter months likely reflect a history of Tricolored Blackbirds summering in the bottomlands on the south side of the Columbia River near Portland, Oregon (Marshall et al. 2003). Steve Mlodinow, Bob Flores, and Wilson Cady (pers. comm.) confirmed the Tricolored Blackbird is not known to breed in Clark County.

DISCUSSION

The Tricolored Blackbird is now a resident species in Washington. It has nested in six locations in five counties and is present through the winter. Its breeding range remains limited to the Columbia Basin. All of the breeding colonies have been in freshwater marshes dominated by emergent vegetation, and there have been no reports of breeding in other substrates. Tricolors have foraged in irrigated agricultural areas, but there are no data on how or if they forage in grasslands or shrub-steppe habitat, and there are no reports which estimate the spatial extent of the breeding habitat.

At 34 birds the average colony in Washington is small, which may hinder the tricolor's ability to expand in Washington. Small colonies are more vulnerable to predators, which can decimate the closely positioned nests and lead to abandonment of the colony. Small colonies are also related to poor reproductive success. Orians (1961), Payne (1969), and Meese (2013) found that nesting success is positively related to colony size and insect abundance.

Even when conditions are favorable, the rate of the Tricolored Blackbird's reproductive success can be low. Over five years of study, Payne (1969) observed mass desertions of entire colonies of nests with eggs, and he estimated that only 40% of tricolor nests produced fledglings. In Washington's small tricolor colonies that could mean that only seven pairs in the average colony of 34 would fledge any young.

Further affecting the Tricolored Blackbird are changing conditions in the Columbia Basin. Washington's State Wildlife Action Plan 2015 Update (https://wdfw.wa.gov/sites/default/files/publications/01742/wdfw01742.pdf) identified changing conditions for wildlife due to multi-year drought; continuing threats to freshwater ecosystems for both water quality and quantity, including excess nutrient and pesticide runoff, habitat degradation through conversion and fragmentation, and the spread of invasive species. Dudgeon et al. (2005) found these factors contributed to the decline of biodiversity in freshwater systems. These conditions have also led to diminished species richness of insects in various habitats including shrub-steppe (Ball-Damerow et al. 2014). Pesticide use in farmland further reduces the insect populations the Tricolored Blackbird requires for successful breeding (Johnson 2007).

The nature of the eBird data limited this review. Preferential sampling resulting from the temporal and spatial bias of the observations likely affected my findings (Robinson et al. 2018). It appears that contributors to eBird most often chose to seek tricolors in the spring and in locations where they were likely to find them. There was less effort to locate the species at other known locations and at new but potentially suitable locations.

Factors related to the Tricolored Blackbird's behavior may also have limited the evidence for breeding. The brevity of the species' nesting cycle constrains the opportunities for observation. Early in the cycle, males may spend as much as one-half their time out of sight in dense vegetation (Orians and Christman 1968). Later in the cycle both sexes can forage up to 9 km from the colony, suggesting that some birds will be missed by observers at the colony.

So far in Washington information about the Tricolored Blackbird has been gathered through individual efforts by concerned citizens. A few dedicated individuals have attempted to monitor breeding colonies and suitable areas for several years. Despite these efforts, only 30 of 898 eBird checklists I reviewed indicated probable or confirmed breeding. The eBird records also appear to have confirmed the absence of breeding Tricolored Blackbirds at some locations.

Assessment of the potential of the Tricolored Blackbird to expand in Washington could improve if we know more about its nesting behavior, reproductive success, foraging behavior, and wintering locations. A good next step would be a systematic survey modeled on California's triennial statewide survey (Meese 2017). The eBird data have provided a history of breeding locations and general information about the species' distribution in Washington, and this information could serve to direct survey efforts most efficiently. The six colony sites so far identified plus other suitable habitat, some yet to be evaluated, should be included in a survey during the breeding period, and any breeding colonies located should be closely monitored. Such survey data would provide information to the Washington Department of

Fish and Wildlife, which has recently added the Tricolored Blackbird to the 10-year Washington Wildlife Action Plan, the next revision of which is due in 2025 (J. Fidorra pers. comm.).

This assessment provides the first comprehensive attempt to document the distribution and abundance of the Tricolored Blackbird in Washington. The species' arrival in Washington may have been related to persistent drought in California (Robinson et al. 2021), and, in turn, to warming at more northern latitudes due to climate change (Erickson et al. 2018). Existing evidence suggests that the Tricolored Blackbird's wider range expansion described by Wahl et al. (2005) has been followed by years of the population size fluctuating in both the breeding and nonbreeding seasons.

Compared to colonies consisting of thousands to tens of thousands of breeding birds in California, the small colony sizes in Washington may reflect a distinctive response to local conditions. In Washington the blackbirds breed in small, scattered colonies that may change location from year to year. Over the past 25 years, they have evidently found enough suitable habitat to sustain a small population of indeterminate size, but not enough suitable nesting or foraging habitat, or other essential requirements for breeding such as an abundance of insects, to expand their numbers. They appear to persist in Washington in large part as a result of environmental subsidies provided by humans: first, the wetlands created by the Columbia Basin Project in which they nest, and second, the stored grains at one known, and likely additional unknown locations, that help to sustain them during winter.

It seems reasonable to predict that conditions for the Tricolored Blackbird's breeding in Washington may not improve substantially, as suitable breeding habitat is limited to what has already been created by the Columbia Basin Project and continued climate warming will likely exacerbate continuing drought, further limiting opportunities for breeding. The current data suggest that a small population may persist in Washington, but without management to augment the habitat, Washington does not provide conditions that would allow it to serve as a climate refuge for large numbers of Tricolored Blackbirds if conditions for breeding in California continue to deteriorate.

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