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Predation and Scavenging on Other Birds by Western Meadowlarks (*Sturnella neglecta*) during a Spring Snowstorm

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ABSTRACT.—Severe weather can cause birds to abandon normal foraging habits and switch to more opportunistic behaviors. We report 47 incidents of Western Meadowlarks (*Sturnella neglecta*) consuming five bird species during a spring snowstorm on the high plains of southeastern Wyoming, including four previously undocumented species. Over half (57%) of our observations were of meadowlarks scavenging dead birds, 13% were of meadowlarks preying on live birds, and in 30% of the cases we could not determine how consumed birds died. Interestingly, the species most frequently depredated by meadowlarks, Horned Lark (*Eremophila alpestris*), is larger than any avian species previously known to be preyed on by meadowlarks. Our observations suggest that meadowlarks may be more capable and frequent predators of adult birds than previously recognized. Received 24 September 2015. Accepted 12 January 2016.

Key words: cannibalism, opportunism, predation, scavenging, snowstorm, *Sturnella neglecta*.

Severe weather events, especially winter storms, can increase avian thermoregulatory costs and reduce usual foraging opportunities (Davidson 1981, Dugan et al. 1981), causing birds to change their behavior, diet, or both (Goss-Custard 1969, Evans 1976, Davidson 1981). Some larger-bodied birds, including European Shags (*Phalacrocorax aristotelis*; Daunt et al. 2006) and many heron and egret species (DuBowy 1996), suspend foraging during severe weather to maintain energy reserves. In contrast, some smaller-bodied species like the Common Redshank (*Tringa tetanus*) adopt riskier foraging strategies during severe weather (Goss-Custard 1969), while Eastern Bluebirds (*Sialia sialis*) increase their time spent foraging and spend more time gleaning for insects rather than hawking (Pinkowski 1977). These behavioral and dietary changes can also involve shifts to more opportunistic foraging strategies, including scavenging and predation on rarely

consumed prey species. Hobson and Sealy (1987) suggested that opportunistic scavenging and ground foraging by Tree Swallows (*Tachycineta bicolor*) occurred in response to inclement weather. Opportunistic predation of Common Murres (*Uria aalge*) by Northern Fulmars (*Fulmarus glacialis*; Lorenz and Seneveratne 2008), and Belding's ground squirrels (*Urocitellus beldingi*) by Clark's Nutcrackers (*Nucifraga columbiana*; Mulder et al. 1978) have also been attributed to inclement weather.

Previous reports of Western Meadowlarks engaging in scavenging, predation, and cannibalism are sparse or non-existent, as meadowlarks predominately consume vegetable matter and insects (Davis and Lanyon 2008). However, Western Meadowlarks have been documented consuming a variety of bird species. Hubbard and Hubbard (1969) observed at least 10 incidents of Eastern Meadowlarks (*S. magna*) and Western Meadowlarks scavenging carcasses of various road-kill bird species. Tyler and Choate (1990) also reported both meadowlark species scavenging dead carcasses of three different bird species (including conspecifics) and five mammal species. Additionally, a single report of an Eastern Meadowlark scavenging on a dead conspecific was reported by Terres (1956).

Reports of meadowlarks preying on live birds are even less common. At least three incidents of Eastern Meadowlarks preying on American Goldfinches (*Spinus tristis*) occurred in 1990 (Bell 1990), and Schrick (1979) observed meadowlarks preying on two American Tree Sparrows (*Spizella arborea*). Waters (1990) observed meadowlarks attacking and killing American Goldfinches and Pine Siskins (*Spinus pinus*), and found 16 carcasses of Pine Siskins, three carcasses of American Goldfinches, and several unidentifiable finch carcasses over 4 days, which were assumed to be the result of meadowlark predation. However, this report indicated only one predation event was directly observed, suggesting that predation

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by meadowlarks could not be confirmed as the cause of death for the other individuals. Interestingly, all of these previous reports of scavenging and predation occurred during severe snowstorms. Here, we present observations of opportunistic scavenging, predation, and cannibalism by Western Meadowlarks (*Sturnella neglecta*) on multiple bird species during a spring snowstorm near Laramie, Wyoming, USA.

METHODS

Most lands around Laramie (41° 18.4' N, 105° 35.2' W; elevation ~2184 m above sea level) consist of short-grass prairie and are used for cattle ranching. Between 15–18 April 2015, a snowstorm deposited 48 cm of wet, heavy snow in Laramie (NRCS SNOTEL) and covered the vast majority of surrounding prairie. On 16 April from 07:30 hrs to 18:45 hrs MDT, 17 April from 10:45 hrs to 14:35 hrs, and 18 April from 11:45 hrs to 16:30 hrs, we slowly drove roads immediately west and north of Laramie to observe snowstorm effects on avian species. There we found large numbers of ground-dwelling passerines congregating and searching for food along roads where plows had removed snow, including Horned Larks (*Eremophila alpestris*), McCown's Longspurs (*Rhynchophanes mccownii*), Chestnut-collared Longspurs (*Calcarius ornatus*), Vesper Sparrows (*Poocetes gramineus*), and Western Meadowlarks. Many of these birds were lethargic, hundreds had been killed by vehicle collisions, and we observed some Western Meadowlarks consuming other birds.

Upon encountering a meadowlark consuming another bird, we recorded 1) the general location of the incident, 2) the species being consumed, and 3) whether the event was scavenging, predation, or unknown. We considered an event to be predation if we witnessed a meadowlark killing a live individual or if other evidence unambiguously indicated predation (see Results). Scavenging was inferred only if the prey item had clearly been hit by a vehicle (e.g., was found flattened in the road). Events were classified as unknown when we could not determine if the bird being consumed had died as the result of predation, vehicle collision, or other factors (e.g., hypothermia, malnutrition, or similar phys-

iological stress). Additionally, we received two reports of meadowlark carnivory from a local birder (Jan McKee) in nearby Cheyenne, WY who observed both events in her backyard during the same snowstorm.

RESULTS

We documented 47 carnivory events by Western Meadowlarks. The majority (27) were scavenging events, with 6 predation events, and 14 unknown events. Horned Larks (35) were the most commonly consumed species, followed by other Western Meadowlarks (4), and then 2 each of McCown's Longspurs, American Robins (*Turdus migratorius*), and Dark-eyed Juncos (*Junco hyemalis caniceps*). Two prey individuals could not be identified to species because only small pieces of flesh and degraded down feathers were found. We witnessed four Horned Larks and one McCown's Longspur being preyed on by Western Meadowlarks. Additionally, we received a report of a Western Meadowlark preying on a Dark-eyed Junco during the same snowstorm at a residence in Cheyenne, WY.

While we did not observe a single predation event in its entirety, we saw a sequential range of predation stages. One of four Horned Larks being depredated was first seen with its right wing in the bill of a meadowlark. The meadowlark attempted to force the Horned Lark under its feet, but upon our approach released the individual and flew away. The Horned Lark was unable to fly after this encounter and died shortly afterwards. The McCown's Longspur we saw being depredated was secured under the feet of a meadowlark, which was in the process of gouging the longspur's eyes out with its bill. A similar behavior was observed during two other Horned Lark predation events. The longspur and other Horned Larks also died shortly after each incident.

The last predation event we observed was a dead Horned Lark being consumed by a meadowlark. By the time we approached this individual, the meadowlark had consumed most of its brain and eyes and was in the process of consuming the remainder (Fig. 1). We inferred that this individual had been depredated rather than scavenged because: the Horned Lark and Western Meadowlark tracks in the snow around



FIG. 1. Western Meadowlark (*S. neglecta*) consuming the brain of a Horned Lark (*E. alpestris*) after a severe spring snow storm (photo by N. Behl).

the carcass suggested a struggle, there were drops of blood and numerous Horned Lark feathers in the surrounding area, the Horned Lark appeared to be in otherwise good overall condition without other noticeable injuries, suggesting it had not been struck by a vehicle.

The sequence of our observations comports well with the single predation event witnessed in its entirety, on a Dark-eyed Junco. The Western Meadowlark surreptitiously approached the junco from behind, seized the back of its skull in its beak, pinned it down, and pecked the junco's skull until the bird died. The cause of death could not be confirmed for a second junco being consumed at this location, but several meadowlarks were observed trying to kill juncos there, and it is likely this was also a predation event.

DISCUSSION

We report Western Meadowlarks scavenging on carcasses of three previously undocumented species: American Robin, Horned Lark, and McCown's Longspur. We also document predation by Western Meadowlarks on three species: Horned Lark, McCown's Longspur, and Dark-eyed Junco that were previously unknown to be preyed on by Western Meadowlarks, and are considerably larger than avian species previously reported as meadowlark prey (e.g., American Goldfinch, Pine Siskin, and American Tree Sparrow).

American Goldfinches have an average spring mass of 14.87 ± 1.13 g (Wiseman 1975), the average spring mass of Pine Siskins is $12.91 \pm$

1.15 g (Dawson 2014), and American Tree Sparrows average 18.02 ± 1.92 g (Naugler 2014). In contrast, Horned Larks (*H. a. leucoloma*) average 32.69 ± 3.09 g (CKP, unpubl. data), McCown's Longspurs average 25.34 ± 1.77 g (CKP, unpubl. data), and gray-headed juncos average 19.60 ± 1.10 g (Dunning 1993). Thus, species preyed on by Western Meadowlarks (119.31 ± 8.77 g; CKP, unpubl. data) in our observations are 5–310% larger than the previously reported prey species.

Our observed predation events occurred in close proximity to other bird carcasses, both previously scavenged and apparently intact carcasses. Since meadowlarks apparently chose to kill live individuals rather than scavenge nearby carcasses, and depredated individuals of a species (Horned Lark) that averages ~27% of the body mass of Western Meadowlarks, our observations suggest that Western Meadowlarks may be more capable predators of other birds than has been previously understood. In all successful predation events and several scavenging events, meadowlarks were observed consuming only the eyes and brains of birds. In all of these cases, prey individuals' bodies were intact and without major injuries that exposed muscles or internal organs. Conversely, when the muscles or internal organs of prey were exposed, meadowlarks also consumed these tissues. We suspect that the long and relatively straight bill of meadowlarks renders this species unable to tear open intact carcasses, but is better-suited for probing and piercing into pre-existing cavities.

Given the frequency of severe spring snowstorms throughout much of the range of Western Meadowlarks, our observations in this report, and previous observations of meadowlark predation (Schrick 1979, Bell 1990, Waters 1990), scavenging (Hubbard and Hubbard 1969, Tyler and Choate 1990), cannibalism (Terres 1956, Tyler and Choate 1990), and nest depredation (Creighton and Porter 1974, Schaeff and Picman 1988, Picman 1992), we suspect that opportunistic scavenging and predation by Western Meadowlarks may occur more often than is currently recognized. However, it is still unclear how prevalent this behavior is. Does it only occur during extreme weather events, and if so, what physiological thresholds must meadowlarks or prey reach before such events happen? Why do

meadowlarks choose to depredate live individuals instead of scavenging apparently suitable carcasses? How much might such behaviors help individual meadowlarks or their local populations survive, or potentially affect rare species? Hopefully, future research will provide answers to these questions about this widely distributed and relatively abundant grassland species of the North American Great Plains.

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