MacGillivray's Warbler

Geothlypis tolmiei

REGULATORY STATUS

USFWS: Migratory Bird
USFS R2: No special status
USFS R4: No special status
Wyoming BLM: No special status
State of Wyoming: Protected Bird

CONSERVATION RANKS

USFWS: No special status
WGFD: NSS4 (Bc), Tier II
WYNDD: G5, S4
Wyoming Contribution: LOW
IUCN: Least Concern
PIF Continental Concern Score: 11

STATUS AND RANK COMMENTS

MacGillivray's Warbler (*Geothlypis tolmiei*) does not have any additional regulatory status or conservation rank considerations beyond those listed above.

NATURAL HISTORY

Taxonomy:

Two subspecies of MacGillivray's Warbler are recognized and known to breed in the United States: *G. t. tolmiei* and *G. t. monticola* [1]. In Wyoming, *G. t. monticola* is the known subspecies; it breeds east of the Pacific slope, in the Rocky Mountains and Great Basin, and winters in higher elevations of central and southern Mexico, occasionally in southern California [2, 3]. Two additional subspecies of *G. tolmiei* are not recognized by the American Ornithologists' Union (AOU): *G. t. intermedia* and *G. t. austinsmithi*. The distinguishing characteristic is reported to be a shorter tail length in *G. t. austinsmithi* and there are specimens of said subspecies from western Wyoming [1, 4]. Recent molecular phylogeny efforts concluded that MacGillivray's Warbler is more closely related to the genus *Geothlypis* [5]. The AOU approved the genus change in 2011 [6]. Prior to this, the species was placed in the genus *Oporornis*.

Description:

The species is a small wood-warbler in the Parulidae Family. MacGillivray's Warbler is identifiable in the field during the breeding season. Male upperparts are olive green and underparts are yellow. Head is dark gray with a black throat and black lores. Females are similarly colored, though more drab overall. Females do not have black lores. Both sexes have white crescents above and below the eye, pale pinkish legs and feet, and black eyes. Juveniles are even more drab in color than females [7]. While Common Yellowthroat (*Geothlypis trichas*) shares some basic similarities with MacGillivray's Warbler, the male has a distinct black face mask and olive head, while the female has a yellow throat. Two additional similar species

include Mourning Warbler (*Geothlypis philadelphia*) and Connecticut Warbler (*Oporornis agilis*). Although both are considered rare in Wyoming, they have been documented in eastern and western parts of the state. Mourning Warbler is typically distinguished from MacGillivray's Warbler by larger body measurements, usually a lack of eye crescents, and in almost all cases, the species' ranges do not overlap [8-10]. Connecticut Warbler is larger than MacGillivray's Warbler and has a complete white eye ring. Connecticut Warbler males have a gray throat and females have a brown-gray top of the head [7].

Distribution & Range:
MacGillivray's Warbler is distributed across the western portion of North America during the breeding season. Wyoming forms a significant southeastern portion of MacGillivray's Warbler breeding range [7, 11]. MacGillivray's Warbler has been documented in 27 of Wyoming's 28 latitude/longitude degree blocks with confirmed or circumstantial breeding documented in 24 of these latitude/longitude degree blocks [12]. Limited information about distribution in Wyoming during migration suggests the species prefers low elevation areas with a shrub layer for cover; this may include developed areas [4]. MacGillivray's Warblers that summer in Wyoming are believed to primarily winter in higher elevation areas in central and south Mexico [2].

Habitat:
Rangewide, MacGillivray's Warbler is known to utilize a great variety of coniferous and deciduous forest habitats, as well as shrub-dominated areas without a canopy layer. The species is also known to use areas that have been logged, burned, and affected by windfall events. More specifically, this species tends to be highly dependent on riparian habitats with thick understories, especially so in the southern reaches of its breeding range [7, 13]. In Wyoming, MacGillivray's Warbler generally uses cottonwood-riparian, riparian shrub, and forested areas up to 3,000 m [4, 12]. In southeastern Wyoming MacGillivray's Warbler preferred areas with low tree canopy cover, dense shrub cover consisting of willows (*Salix* spp.) and Thin-leaf Alder (*Alnus incana tenufolia*), saturated soils, and a heavy grass stratum [14, 15]. Additional research in neighboring Utah indicates vegetative composition of breeding areas becomes less dominated by a deciduous tree canopy as elevation increases, to areas composed primarily of shrubs, such as willows, alder, and dogwood (*Cornus* spp.) [16]. Winter habitat includes a variety of forest types, with a strong preference for areas with shrubby, dense, overgrown understories near live water [7].

Phenology:
MacGillivray's Warbler arrives in Wyoming for the breeding season in mid-May; with the earliest report on 4 May. The species departs for wintering grounds beginning in late August through early September. There is a Wyoming report of 15 October [4]. The species lays one egg per day and a clutch usually contains 4 eggs, but can range from 1–5 eggs. Incubation is typically 11–13 days. Fledglings leave the nest 8–9 days after hatching [17, 18]. MacGillivray's Warbler is not known to initiate a second nest during the breeding season [7].

Diet:
MacGillivray's Warbler feeds primarily on insects gleaned from bark and foliage of trees and shrubs [19-21]. Prey includes true bugs (Hemiptera), leaf hoppers (Homoptera), beetles (Coleoptera), bees, wasps and ants (Hymenoptera), alfalfa weevil (Coleoptera), and caterpillars (Lepidoptera) [17, 22, 23]. In Wyoming, the species forages at different heights on a seasonal basis, with average foraging height during early summer months is 0.52 m, and 1.71 m in late summer [21]. Another study documented the species feeding 3–5 m above ground level in Wyoming [24].

CONSERVATION CONCERNS

Abundance:
Continental: WIDESPREAD
Wyoming: COMMON
Using North American Breeding Bird Survey (BBS) data, the Partners in Flight Science Committee estimated the global population of MacGillivray's Warbler to be 12 million birds [25]. Approximately 1.4% of the global population, or an estimated 170,000 birds, breed in Wyoming [26]. The statewide rank of COMMON is based on the relatively large area of the state known to be occupied in any given season, and the large coverage of suitable habitat within that area. Within suitable habitat in the occupied area, MacGillivray's Warbler also appears to be common and is usually encountered during surveys that could be expected to indicate its presence [12]. MacGillivray's Warbler density (number of birds per square km) and population size estimates for Wyoming are available from the Integrated Monitoring in Bird Conservation Regions (IMBCR) program for the years 2009–2015, although detections are limited so data must be interpreted with caution [27].

Population Trends:
Historic: UNKNOWN
Recent: STABLE
MacGillivray's Warbler population trend data from the North American BBS are available from 1968–2013 and suggest a moderate decline in Wyoming [28]. However, results have been determined to fall within a credibility category containing data with 'deficiencies' due to low relative abundance and number of routes with MacGillivray's Warbler detections, so also must be interpreted with caution [28].

Intrinsic Vulnerability:
MODERATE VULNERABILITY
In Wyoming, MacGillivray's Warbler is moderately vulnerable to extrinsic stressors. The species' primary vulnerabilities stems from impacts to montane riparian and forested breeding grounds and the potential for decreased fecundity due to brood parasitism [17, 29]. The taxon has a relatively low reproductive rate, producing only 1 brood per year [7].

Extrinsic Stressors:
SLIGHTLY STRESSED
Common stressors to MacGillivray's Warbler include livestock overgrazing, residential development, and crop agriculture in montane riparian breeding habitats [29]. In addition to direct human stressors, large ungulate herbivory and browsing may negatively influence the abundance of this taxon [30]. Moose (*Alces americanus*) population research conducted in Grand Teton National Park suggests the absence of large predators, such as Gray Wolf (*Canis lupis*) and Grizzly Bear (*Ursos arctos*), can negatively impact shrub height and volume, as well as MacGillivray's Warbler presence [31]. Another stressor to MacGillivray's Warbler populations is Brown-headed Cowbird (*Molothrus ater*) brood parasitism. Proximity to human-occupied structures and livestock structures may increase rates of parasitism and reduce nest productivity [32]. Finally, while timber harvests, avalanche run paths, and windfall corridors may initially provide new breeding habitat for this species, long-term breeding habitat is likely not improved if these areas are replanted with single species tree stock [7].

KEY ACTIVITIES IN WYOMING

MacGillivray's Warbler is listed as a Species of Greatest Conservation Need (SGCN) in Wyoming by the Wyoming Game and Fish Department, and as a Level II Priority Species requiring monitoring action in the Wyoming Bird Conservation Plan [33]. Habitat loss, degradation, and fragmentation, and incompatible livestock grazing and land use practices could be problematic for this species, and current monitoring programs suggest stable to slightly decreasing population trends. Current statewide efforts for monitoring annual detections and population trends of MacGillivray's Warbler in Wyoming include the BBS program conducted on 108 established routes since 1968 [28], and the multi-partner IMBCR program initiated in 2009 [27]. Trend data are available on the United States Geological Survey BBS website [28], and occupancy, density, population estimates, and decision support tools are available through the Rocky Mountain Avian Data Center [27]. Across its range, MacGillivray's Warbler has not been the focal species of any specific conservation or management actions. This species is likely to benefit from management practices directed to less common species with similar habitat requirements.

ECOLOGICAL INFORMATION NEEDS

Knowledge of how MacGillivray's Warbler responds to drought and climate change is poorly understood. More exact information on population trends is needed and will continue to be refined through the IMBCR and BBS programs.

MANAGEMENT IN WYOMING

This section authored solely by WGFD; Andrea C. Orabona. MacGillivray's Warbler is classified as a SGCN in Wyoming due to moderate population declines and severe habitat impacts that can occur from drought and climate change. Two separate but compatible survey programs are in place to monitor MacGillivray's Warbler populations. The first is the long-term BBS started in Wyoming in 1968 with 108 established routes [28]. Species must be detected on at least 14 routes for data analyses to be significant for tracking population status and trend over time. The IMBCR program was established in 2009 in Wyoming with many state, federal, and nongovernmental organization partners that contribute funding, field personnel, technical assistance, or in-kind services. Data analyses produce density, occupancy, and population estimates at various scales and provide decision support tools for managers [27]. Best management practices or key management recommendations to benefit MacGillivray's Warbler include maintaining dense shrubs and diverse vegetation heights in wetland and riparian habitats, using rotational livestock grazing during the nesting season to rest wetland and riparian areas from cowbird concentrations and brood parasitism, and minimizing insecticide use in wetland and riparian habitats [33].

CONTRIBUTORS

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Figure 1: Adult male MacGillivray's Warbler in Laramie County, Wyoming. (Photo courtesy of Shawn Billerman)

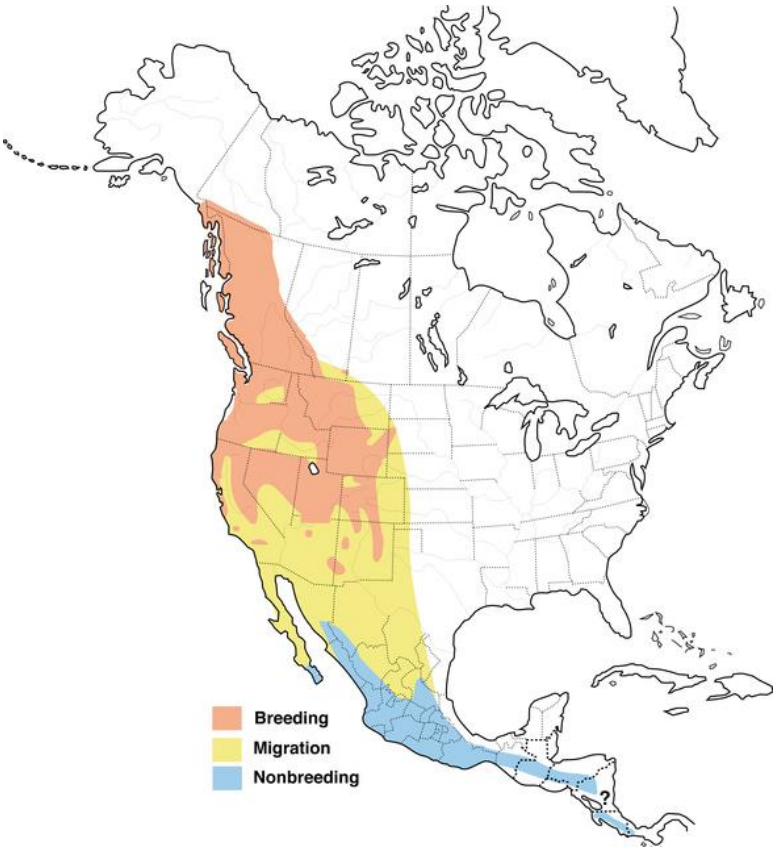

Figure 2: North American range of *Geothlypis tolmiei*. (Map courtesy of Birds of North America, http://bna.birds.cornell.edu/bna, maintained by the Cornell Lab of Ornithology)

HABITAT PHOTOGRAPH

Figure 3: Photo not available.

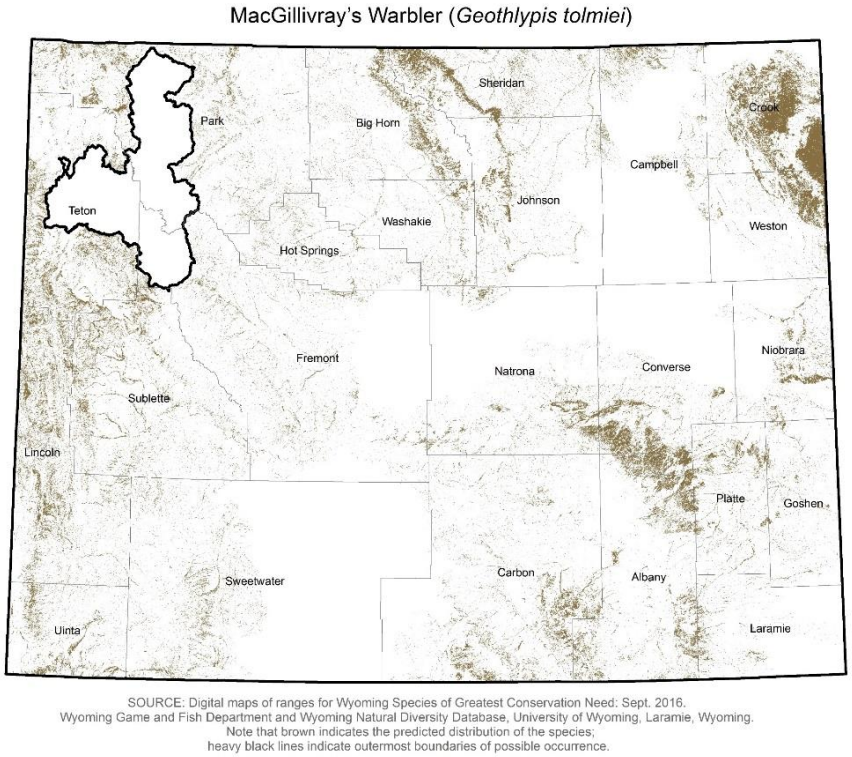

Figure 4: Range and predicted distribution of *Geothlypis tolmiei* in Wyoming.