

Conservation Assessment
for
Yellow-Bellied Flycatcher (Empidonax flaviventris)



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This document is undergoing peer review, comments welcome

This Conservation Assessment was prepared to compile the published and unpublished information on the subject taxon or community; or this document was prepared by another organization and provides information to serve as a Conservation Assessment for the Eastern Region of the Forest Service. It does not represent a management decision by the U.S. Forest Service. Though the best scientific information available was used and subject experts were consulted in preparation of this document, it is expected that new information will arise. In the spirit of continuous learning and adaptive management, if you have information that will assist in conserving the subject taxon, please contact the Eastern Region of the Forest Service Threatened and Endangered Species Program at 310 Wisconsin Avenue, Suite 580 Milwaukee, Wisconsin 53203.

Table of Contents

EXECUTIVE SUMMARY	4
INTRODUCTION AND OBJECTIVE.....	4
BIOLOGICAL AND GEOGRAPHICAL INFORMATION	4
LIFE HISTORY.....	7
POPULATION BIOLOGY AND VIABILITY.....	8
POTENTIAL THREATS AND MONITORING	8
REFERENCES	9
APPENDIX.....	10

EXECUTIVE SUMMARY

The yellow-bellied flycatcher is classified as Threatened in Pennsylvania, probably on the basis of low numbers and disjunct populations. The bird successfully breeds within the Allegheny National Forest, which is just within the southern edge of the bird's breeding range. It is a habitat specialist, nesting on the ground in sphagnum bogs with heavy shrub density. Primary threat to the bird is loss of nesting habitat through alteration of habitat, which may also result from deer browsing. Current wildlife monitoring efforts need to be enhanced to include additional sites representative of yellow-bellied flycatcher habitat.

INTRODUCTION AND OBJECTIVE

This conservation assessment is designed to provide sufficient background information for forest managers on the Allegheny National Forest to develop a comprehensive Conservation Strategy for the yellow-bellied flycatcher, a rare bird in Pennsylvania, recently found breeding successfully on the Allegheny National Forest and which is rated as a threatened species in Pennsylvania by the Pennsylvania Natural Diversity Inventory.

BIOLOGICAL AND GEOGRAPHICAL INFORMATION

Scientific name:	Empidonax Faviventris (Baird & Baird)
Common name:	Yellow-bellied Flycatcher
Family:	Tyrannidae (Tyrant flycatchers)
Synonyms:	None
USFS Region 9 Status:	Regional Forest Sensitive on the Allegheny National Forest only
USFWS Status:	None

Pennsylvania status: Threatened (Species that may become endangered within the foreseeable future throughout their range in Pennsylvania unless the causal factors affecting the organism are abated. These are: 1) species whose populations within the Commonwealth are decreasing or have been heavily depleted by adverse factors and while not actually endangered, are still in critical condition; 2) species whose populations may be relatively abundant in the Commonwealth but are under severe threat from serious adverse factors that have been identified and documented; or 3) species whose populations are rare or peripheral and in possible danger of severe decline throughout their range in Pennsylvania; or 4) species determined to be "Threatened" pursuant to the Endangered Species Act of 1973, Public Law 93205 (87 Stat. 884), as amended, that are not listed as "Pennsylvania Endangered").

Global and State rank: Global Rank is G5 (Secure – Common, typically widespread and abundant. Typically with considerably more than 100 occurrences and more than 10,000 individuals). *State Rank* is S1/S2B (The S1/S2 ranking signifies uncertainty about the rank, splitting it between S1 and S2: S1 = Critically Imperiled {critically imperiled in the state because of extreme rarity or because of some factor(s) making it especially vulnerable to extirpation from the state. Typically 5 or fewer occurrences of very few remaining individuals or acres}; and S2 =

Imperiled {imperiled in the state because of rarity or because of some factor(s) making it very vulnerable to extirpation from the state. Typically 6 to 20 occurrences or few remaining individuals or acres}. The “**B**” designation after S1/S2 signifies that the S1/S2 ranking refers to a *breeding* population within Pennsylvania.

Global Distribution: North and Central/South American east of the Rocky Mountains. Breeding range. – Northern British Columbia and west-central and southern Mackenzie to southern Labrador and Newfoundland south to central Alberta, northern North Dakota, and northern Minnesota, across to southern Ontario, northeastern Pennsylvania, and Nova Scotia (Fig. 1). Winter range. – Mexico to South America (DeGraaf et al. 1991).

Distribution in Pennsylvania-Counties: Confirmed recorded in Warren, Sullivan, Wyoming, Pike, Monroe, and Lycoming counties, historically recorded in Warren, McKean, Forest, Clearfield, Clinton, Wyoming, and Monroe counties, possible/probable in Elk, Cameron, Tioga, Bradford, and Wayne counties (Gross 1992, Pennsylvania Department of Natural Resource Conservation 2000)(Fig. 2). Pennsylvania represents the southern limit of the yellow-bellied flycatcher’s breeding range (American Ornithologist’s Union 1983).

Distribution in Pennsylvania-Physiographic Province: According to breeding bird records, the yellow-bellied flycatcher has been detected in the Appalachian Plateau Province in the Allegheny High Plateau Section, the Pocono Plateau Section, and the Glaciated Low Plateau Section which together form the northern tier of Pennsylvania excluding the Eastern Lake Section of the Central Lowland Province and the Glaciated Section of the Appalachian Plateau Province (Fig. 2).

Distribution in National Forest(s): The yellow-bellied flycatcher is known as a breeding bird on the Allegheny, the White Mountain, the Green Mountain, the Superior, the Chippewa, the Chequamegon, the Nicolet, the Hiawatha, and the Ottawa National Forests, and as a summer migrant on the Huron-Manistee National Forest.

Habitat: Based on descriptions of nesting sites, the yellow-bellied flycatcher is a habitat specialist. Nesting sites are characterized by damp, cool forests with fairly open canopies, often dominated by conifers, in areas where ground cover is predominantly (80+%) sphagnum moss (*Sphagnum* sp.), is sheltered by ferns and/or shrub cover approaching or exceeding 80%, in association with swamps or other riparian zones and often in moss-covered root systems of up-rooted trees (Bent 1963, Gross 1992, Gross 1998, Harrison 1975, Todd 1940, Walkinshaw and Henry 1957). The actual nest is a cup built into deep beds of sphagnum moss, and it is usually lined with grasses or fine, black rootlets. The determining combination of factors for nesting appears to be sites that are sufficiently cool and moist to harbor considerable stretches of sphagnum moss and that also provide sufficient close-to-ground (within 6 feet) overstory cover for nest security from detection by predators. In Pennsylvania, the bird is found nesting at elevations above 1,900 feet.

In Pennsylvania where the yellow-bellied flycatcher is rare, Gross (1992, 1999) has associated occurrence of the bird with areas that are far from human communities or disturbance in places that, “...have not been significantly effected (sic) by human activities for over 70 years.” He notes further that yellow-bellied flycatcher territories, “...have many of the characteristics attributed to eastern old growth forests: mixed tree age-classes, numerous standing snags and downed logs, pit and mound topography, and dense moss coverage.” These statements could form the basis for an

hypothesis that yellow-bellied flycatcher nesting habitat is primarily old-growth forests remote from, and protected from, human disturbance.

Cope (1936) characterized vegetation and vertebrate communities in four virgin forests in Pennsylvania: a 250 acre tract (Woodbourne) and a 600 acre tract (Silver Lake), both found in Susquehanna County (northeastern Pennsylvania); an 800 acre tract (North Mountain) in parts of Sullivan, Luzerne, and Wyoming Counties in east-central Pennsylvania, and the 14,000 acre tract (Tionesta) in Warren and McKean Counties. She reported finding yellow-bellied flycatchers in none of these virgin forests. Cope characterized only two of these areas as containing sphagnum bogs: the Woodbourne tract, and the North Mountain Tract. The Woodbourne tract may have been too small to harbor yellow-bellied flycatchers, and while Cope did not report finding this bird on the North Mountain tract, historical records indicated it may once have been there in the late 1800's (Cope 1936: 34). Whether forests are characterized as old growth, or virgin, forests, may thus not be the only determinant(s) of breeding habitat for the yellow-bellied flycatcher.

Also, in more northern areas and states, including National Forests in Michigan, Minnesota, Wisconsin, Vermont, and New Hampshire, the yellow-bellied flycatcher is more commonly found (in managed forests bereft of old-growth with considerable human disturbance and presence and at elevations < 1,900 feet) than in Pennsylvania. The fact that the bird is found nesting only in higher elevations in Pennsylvania suggests that the cool, moist environmental conditions supporting the sphagnum moss community found in boreal and other forests farther north occur only occasionally at these higher elevations in Pennsylvania. Three yellow-bellied flycatcher nest sites found by Gross (1998) and others in the Tionesta Area in Pennsylvania were not in old-growth forest but in a sapling stand that resulted from a 1985 blow-down of a portion of the old-growth forest. This stand contained patches of sphagnum moss and a dense sheltering herbaceous/shrub layer along a riparian system.

Biologists at the Warren Forestry Sciences Laboratory (Northeastern Station, USDA Forest Service,) have conducted considerable surveys since 1991 for breeding birds within the Allegheny National Forest on sites including early succession, sapling-pole, grassland-savanna, maturing even-aged second growth, maturing uneven-aged second growth, older maturing (>130+ years) managed forest, and old-growth (deCalesta, unpublished data). The yellow-bellied flycatcher was not detected in any of these sites, including four blocks of old growth in the Tionesta Scenic and Natural Research Area. The savannas included large stretches of sphagnum moss, but did not provide the necessary sheltering overstory of herbaceous/fern/shrub layer, nor midstory (10-30') or overstory (+30') canopies seemingly required as nesting habitat for the bird. Portions of the four old-growth sites surveyed for birds, and in which no yellow-bellied flycatchers were found, were on the plateau top, contained only sparse and infrequent patches of sphagnum moss, and averaged 48% shrub cover (deCalesta, unpublished data), approximately half that reported by Gross (1998) as typical of yellow-bellied flycatcher nesting habitat.

It is my opinion that few places in northern Pennsylvania, including the Allegheny National Forest, provide areas with extensive sphagnum moss ground cover and the sheltering low canopy cover of fern/herbaceous and shrub species that comprise yellow-bellied flycatcher nesting habitat. Bogs are a northern hemisphere phenomenon generally associated with low temperatures and short growing seasons, where ample precipitation and high humidity cause excessive moisture to accumulate.

According to Fike (1999) sphagnum bogs occur in Pennsylvania in the glaciated portions of northeastern and northwestern Pennsylvania and on the unglaciated Allegheny Plateau.

The fern species most often mentioned in association with yellow-bellied flycatcher nest sites in Pennsylvania (Gross 1998) is cinnamon fern (*Osmunda cinnamomea*): generally there are only scattered patches of this fern found within the Allegheny National Forest. Most of the fern species occupying large expanses in the Allegheny National Forest are hay-scented (*Dennstaedtia punctilobula*) and New York (*Dryopteris noveboracensis*) ferns, which may not provide the association with sphagnum moss presumably required by the yellow-bellied flycatcher as nesting habitat. The high white-tailed deer (*Odocoileus virginianus*) population resident within the Allegheny National Forest since 1930 likely has suppressed shrub density below that identified by Gross (1998) for typical yellow-bellied flycatcher nesting sites.

Areas containing the mix of low herbaceous/shrubby cover and sphagnum moss desired as yellow-bellied flycatcher nesting habitat also seem to possess fairly open mid- and over-stories, a characteristic of old-growth forests and sapling stands but not of managed second-growth stands that have advanced to the pole or larger sawtimber class and usually exhibit fairly closed mid and overstory canopies, and low shrub density (mean shrub density in = 17.8%, range 0.0 – 75.2%, in a sample of 38 maturing second-growth stands within the Allegheny National Forest, deCalesta, unpublished data).

LIFE HISTORY

The yellow-bellied flycatcher is an inconspicuous and small bird (its genus name, *Empidonax*, is derived from the Latin *empis* for mosquito or gnat) of cool, shaded forests, sphagnum bogs and riparian zones. It is described as a bird of boreal forests (Godfrey 1983). Like other flycatchers, it hawks (catches in mid-air) small insects by sallying from perch sites. The bird builds its cup-shaped nest in hollows it makes in sphagnum moss beds, usually within swamps and bogs in close association with hemlocks, tamaracks, and spruces. The bird lays 3-4 eggs (white flecked with brown) late in June that take approximately 12-13 days to hatch; fledgling birds are able to fly within 13-14 days of hatching. Both adults feed and care for the young.

It is difficult to separate the yellow-bellied flycatcher from other *empidonax* flycatchers, but generally, they are smaller than the other species (only 4.5 inches long) except the least flycatcher (*Empidonax minimus*), and they have shorter tails and small a bill that makes the head look bigger. They are also greener above and yellower below (the species name, *flaviventris*, means yellow belly in Latin) than all but the Acadian flycatcher. The lower mandible (bill) is orange and the bird has a white eye ring.

The birds migrate to Mexico, Central and South American beginning in mid-August and return to the breeding grounds during May. Lifespan is generally less than 5 years. It is unknown whether young return to areas they fledged from to establish breeding territories.

Food consists chiefly of flying insects the bird catches (hawks) in mid-air after launching itself from perches.

POPULATION BIOLOGY AND VIABILITY

Based on data generated by breeding bird surveys conducted since 1966, trend data for the North American meta-population of the yellow-bellied flycatcher has exhibited a positive trend in rate of increase in detections: +2.63 for the period 1966-1999 and +3.20 for the period 1980-1999 (Fig. 3). More beta populations have been on the increase (as evidenced by increased trend rates – the blocks in light and dark blue, Fig. 3) than populations on the decrease (blocks in orange and red, Fig. 3) throughout the breeding range. In Pennsylvania, Gross (1999) reported that the species successfully fledges young in sites where it is observed breeding and suggested that as additional potential nesting sites are explored the possibility exists that more nesting birds will be found.

POTENTIAL THREATS AND MONITORING

The major threat to the yellow-bellied flycatcher as perceived by Gross (1998) in his report on the status, distribution, and conservation of the species is degradation of the prerequisite habitat factors: sphagnum bogs with dense herbaceous and shrub cover and sufficient other overstory cover to prevent desiccation of the sphagnum mat and also the specialized areas within which these habitat factors coincide: along smaller streams, in stream headwater and seep areas, and in bogs surrounded by dense, shrubby vegetation. Gross (1998) also suggested that overabundant white-tailed deer populations might cause loss of nesting habitat. DeCalesta (1994) noted that once deer density exceeded 20 deer per square mile, midstory (vegetation in the 10-20' height) habitat structure declined as did species richness and abundance of birds nesting in the midstory. Given the higher deer densities occurring within the Allegheny National Forest (>25 deer per square mile since ~ 1930) and known deer impact on vegetation in the shrub layer, deer must also be considered a threat to the yellow-bellied flycatcher.

Because identified beta populations are so small and scattered so widely in Pennsylvania, there is concern that population size is critically small for maintaining an endemic population in Pennsylvania. However, potential for annual recruitment of breeding birds flying through Pennsylvania on the way to the established breeding grounds farther north may compensate somewhat for occasional failures of local populations (Gross 1998).

The brown-headed cowbird (*Molothrus ater*) is recognized as a threat to tyrant flycatchers (it parasitizes the nests, laying its eggs which hatch earlier so that its young can out compete flycatcher young for food)(DeGraaf et al. 1991), but Gross (1998) found no evidence of brown-headed cowbird parasitism in surveyed nest locations even though the species was present. Cowbirds pose little risk to yellow-bellied flycatchers on the Allegheny National Forest because most agricultural lands (required cowbird habitat) are so remote from the forest interior that the cowbird is almost never detected in annual monitoring conducted throughout the Forest (deCalesta, unpublished data).

Currently, annual monitoring for songbirds conducted as part of studies operated by the Warren Forestry Sciences Laboratory (Northeast Research Station, U. S. Forest Service) and as part of monitoring efforts does not provide a comprehensive survey of potential yellow-bellied flycatcher nesting habitat as most sites are on dry, flat portions of the plateau top and on steep hillsides: few of the sites contain true bogs, or provide requisite shrub and overstory canopy closure to provide minimal habitat conditions for this species. It cannot be said of the yellow-bellied flycatcher that comprehensive surveys are conducted as part of bird monitoring activities on the Allegheny

National Forest. Such work is critical, and taken in conjunction with existing surveys, and associated habitat characterization, could provide the basis for comprehensive and thorough description of yellow-bellied habitat preferences as well as for mapping of the distribution of this species within the Allegheny National Forest.

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APPENDIX

Figure 1. Breeding range and relative abundance of the yellow-bellied flycatcher as determined by Breeding Bird Survey data, 2000. Source: U. S. Geological Survey (<http://www.mbr-pwrc.usgs.gov>).

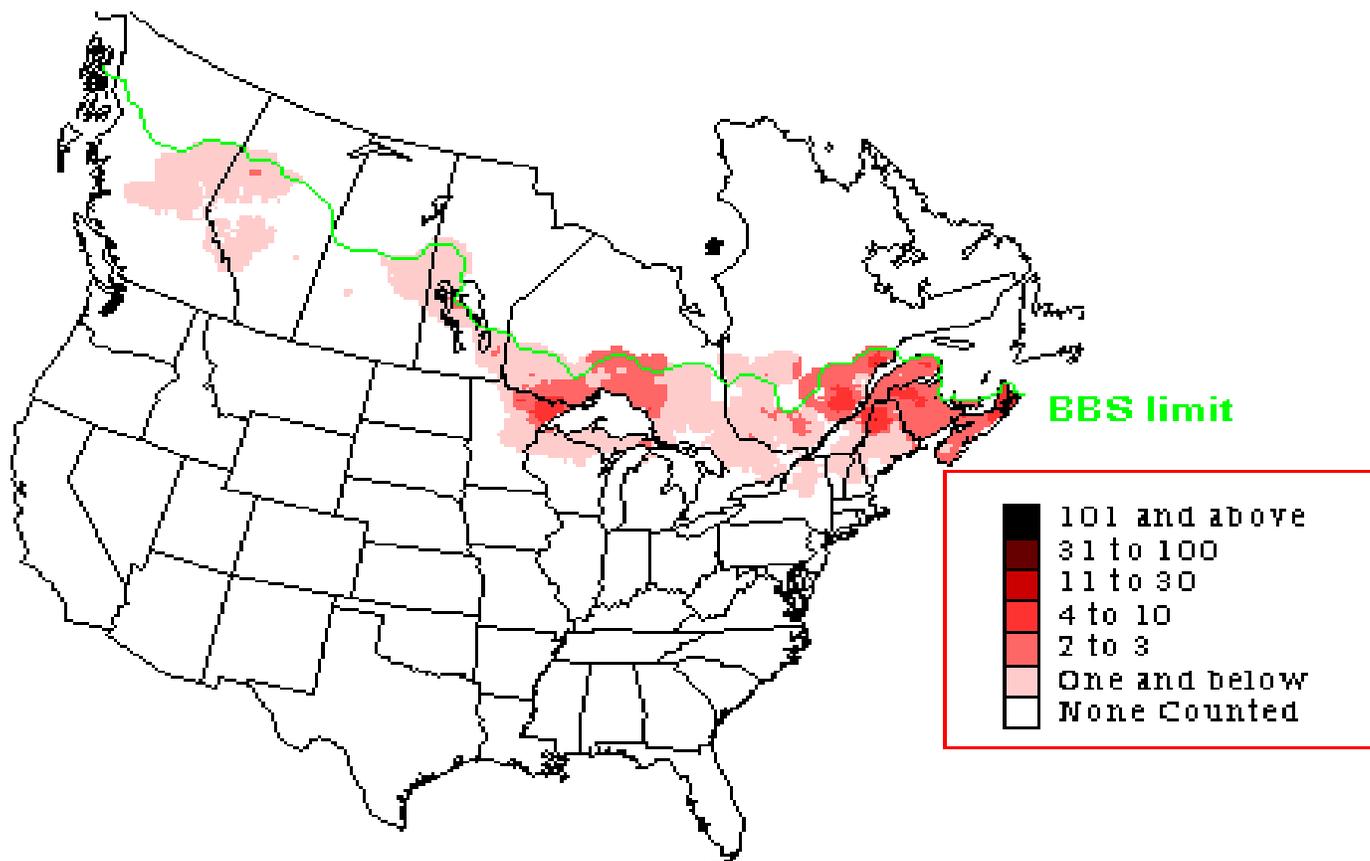


Figure 2. Distribution of the yellow-bellied flycatcher in Pennsylvania.

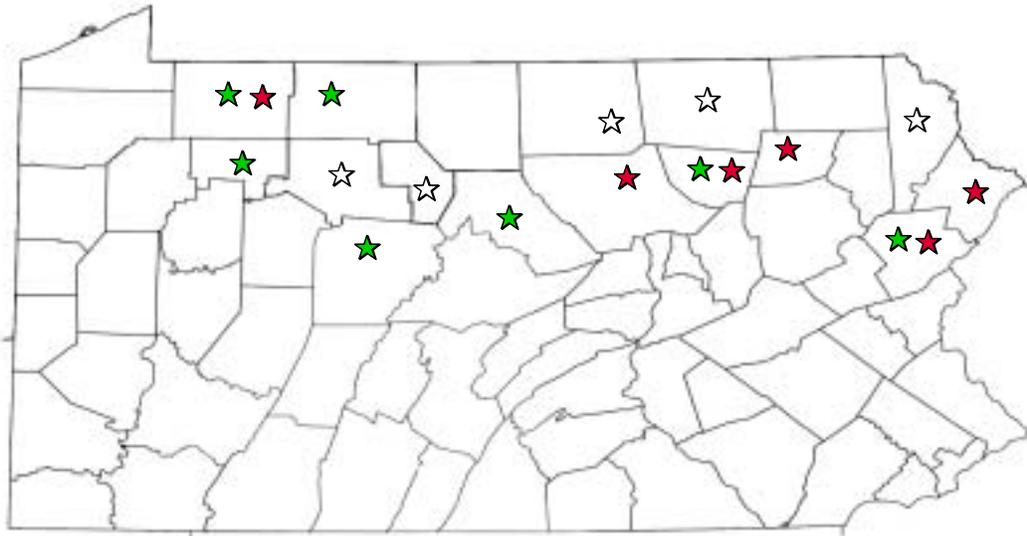


Figure 3. Percent change in abundance of yellow-bellied flycatchers as determined from breeding bird survey routes 1966-1999. Source: U. S. Geological Survey 2000 (<http://www.mbr-pwrc.usgs.gov/>)

