

Fire Management Species Profile

Painted Bunting (*Passerina ciris*)

Emphasis on Eastern Breeding Population

Federal Status (19): Not listed

State Ranking (19):

Imperiled- AL, TN

Vulnerable- FL, GA, MS, NC; Secure-AR, LA

Not Ranked- SC

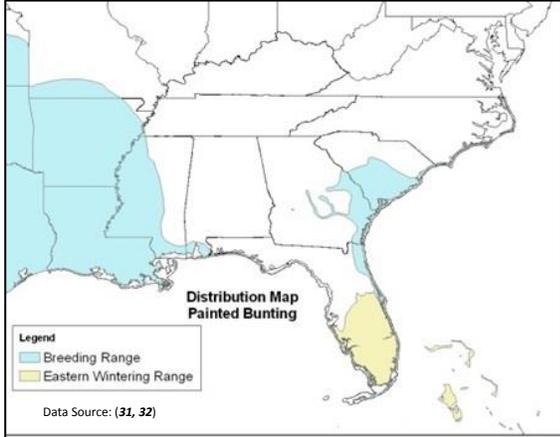


Photo-Ed McGuire

Bio Facts (19)

Size: Small songbird (5 ½")

Nesting: March- July- Low shrubby growth, nest cup

Feeding: Mostly grass seeds also insects and spiders

Eggs: 3-4

Incubation: 11-12 days

Landscape Conservation Cooperatives: South Atlantic, Peninsular Florida, Gulf Coastal Plains and Ozarks, Gulf Coast Prairie

Landfire Zones: 25, 26, 27, 32, 34, 35, 36, 37, 38, 43, 44, 45, 46, 55, 56, 58, 98, 99

Desired Vegetation Structure and Fire Components

Criteria	Monitoring Variables
Canopy/Sub-canopy	Maintain pine-oak canopy cover at <75%, and/or canopy tree stocking at BA ≤ 50 sq ft per acre
Mid-story	Maintain woody shrub component in mid-story (<20 ft tall) cover at 20-50% favoring fleshy fruit bearing shrubs such as wax myrtle and yaupon
Understory	Patches of shrubs 3 to 18 feet tall with a grassy understory component.
Ground Cover	Ground cover of >50 % dominated by grasses
Fire Regime	Little in maritime habitats (10 to 15 year Fire Return Interval, low departure) with increased fire frequency in pine systems (4-6 year Fire Return Interval)
Fire Regime Condition Class	Most desired FRCC1 (low departure from natural regime)
Seasonality	Growing season burns favorable to promote native grasses in pine dominated habitats; winter burns may allow more shrub component to persist; limit area being burned during peak nesting (March -July 30)
Fuel Models	Grass dominated models (GS3,GS4; shrub models (SH3, SH4, SH6, SH8, SH9); Timber-Understory models (TU2, TU3); Timber litter models (TL2, TL6, TL9)
Burn Severity	Low burn severity will promote more shrub component and more mosaic burn across landscape (CBI <1.5); moderate burn severity will promote more grass dominated habitat in pine systems
Fire Behavior	Surface fires with low to moderate fire line intensity with flame lengths less than 10 ft
Landscape Considerations	Landscape made up of open forested or shrubby habitats adjacent to emergent marsh/freshwater feature (e.g. stream, canal) for feeding. Manage for edge habitat patches of at least 2-10 acres. Management units should be > 1200 acres. Use prescribed burning across landscape to create mixed patches of shrub and grass cover

The objective of the Fire Management Species Profile project is to identify habitat management objectives that are specific, measurable, achievable, and clearly communicate among habitat management professionals and are firmly based in the best available science. Their use is intended to guide habitat managers in setting local objectives for habitat management in fire-adapted ecological systems. Fire management objectives are specific to habitat conditions in which maintenance and improvement, rather than restoration, of habitat condition is the goal.

The painted bunting is best described as having eastern and western populations separated by a geographic gap though some authorities have described 2 subspecies and others suggested distinctive species classification (35, 36). This fire management species profile emphasizes the eastern breeding population of painted bunting residing in the South Atlantic Coastal Plain. Some additional information is provided regarding habitat associations from studies of the breeding western population. In general, the painted bunting utilizes a variety of habitats comprised of scrub-shrub and grassland communities from coastal wetlands to more interior early successional hardwoods stands or very open overstory pine and maritime oak forest stands. The upland maritime scrub-shrub habitat of is especially important (17). Fire plays a recurring role in limiting extensive hardwood shrub understory and retention of very open overstory pine habitats. However, prescribed fire within maritime scrub-shrub habitat is not needed as other natural disturbances maintain the habitat (27). The greatest risk to this eastern population appears to be rapid loss of habitat along the outer Coastal Plain attributed to rapid development (16) though other factors may be concurrently contributing to the population decline.

Desired Habitat Conditions

Distribution: The eastern breeding population of painted bunting is along the Atlantic coast from southeastern North Carolina (5) to northeastern Florida, extending inland in South Carolina and Georgia along major river corridors (15, 31). The species breeding range includes the coastal barrier islands (7, 15). Critical habitat for the species is narrow undeveloped maritime scrub-shrub habitats along the coast. The winter range for the species extends from lower Florida, the Bahamas, and Cuba (32).

Habitat Types: In the eastern portion of their U.S. range, painted bunting uses a wide range of habitats and local landscapes (4, 5, 7, 13, 15, 19, 31, 37). The bird mainly consumes grass seeds but also insects and spiders (14, 34). Western breeding populations use semi-open country with scattered trees and shrubs, riparian areas, abandoned farmland and other early successional stages (1, 23, 24, 37). Territorial male bunting in coastal Georgia use open, grassy areas with abundant shrubs and a few scattered trees, near (< 0.5 miles) emergent marsh, including beach dune shrub-scrub-grassland, old growth maritime forest, and open pine forests for nesting and feeding habitat (13, 17, 18, 19). Eastern birds use parts of freshwater and saline wetlands adjoining upland habitats for foraging (31). Maritime scrub-shrub may be high quality habitat, as indicated by high survival rate, relatively small home range size and limited bird movement within home ranges (27). In the winter range open pine forests, marshes, and early successional forests are presumed to be preferred wintering habitat but no published information is available.

Canopy and subcanopy: Birds in forest habitats generally use sites with an open canopy and scattered small openings. Breeding within open (<75% canopy closure) pine-oak stands with (\leq 60 sq. ft. basal area) and areas of old growth maritime forest with tree-fall gaps will be used by painted bunting (19). Canopy openings (\leq 50% cover) are prominent features of older pine or maritime forest used by breeding buntings (especially if adjacent to marshes) (13). Maritime oak forest edges are important habitat for PABU nesting, but only forest edges near emergent marshes, and in old growth forests with canopy openings, shrubs, and >50% grass cover (1, 13, 16).

Mid-story: Development of mid-story in the canopy (>20 feet) and older ages of forest regeneration precludes use by breeding painted bunting (13). In Texas, occurrence of painted bunting use was reported in sites with cover of tall shrubs (10-16 ft.) below 50% (10).

Understory/Ground Cover: In coastal areas, painted bunting uses some forest regeneration cuts (<5 years old) for nesting if grasses and shrub-scrub habitat are allowed to cover the area. Spanish moss and dense herbage in a bush or vine tangle 3-6 feet high or rarely at greater heights up to 23-26 ft are used. The most heavily used areas are patchy mosaics with a shrub-scrub component-especially fleshy fruit-bearing waxed

myrtle (*Myrica cerifera*) or yaupon (*Ilex vomitorium*) interspersed with grasses (*Paspalum spp.* and *Setaria spp.*) (5, 31). These areas will be used extensively with understory cover >50% located within 0.5 miles of emergent marsh (5, 9, 13, 17, 27). Dense patches of woody shrub cover (20-50%) interspersed within grasslands, where grasses provide 50-80% cover have also been reported used by buntings (9, 27). Sapelo Island, Georgia is considered ideal for painted bunting nesting with the unmanaged maritime shrub habitat (15) compared to open pine-oak forest with canopy closure of about 68% where breeding densities were lower. In southwest Missouri, painted bunting territories included predominantly old field vegetation (82%), with the remainder occurring in woodland; vegetative characteristics varied widely between territories suggesting that a broad range of conditions are tolerated (20, 21). In Texas, higher ground cover with some rock cover was related to increases in bunting occurrence (10).

Breeding Information: Male painted buntings begin to establish territories to attract females immediately after returning from winter. Males defend nesting territories (averaging 2-10 acres) that are characterized by enough vegetation to support and conceal the nest (often a single bush), singing perches, and a feeding area for the breeding pair (17). Nesting is done from early March through late July with multiple broods produced. The nest is cup shaped and formed from small grasses and other plant material placed on a supporting branch normally within the understory (15).

Role of Fire: Within maritime scrub-shrub, this plant community generally is maintained through disturbance events of high temperature salt spray storm wash, wind, and flooding largely negates the need to use prescribed fire in the scrub-shrub zone (27). In areas where succession proceeds toward forested climax conditions, managers will need to interrupt this process through mowing, burning, herbicide application or other means (16). In areas of pine and mixed pine-hardwood forests, fire disturbance on a 4-6 year basis is necessary to preclude mid-story development and favor a mosaic of understory vegetation and grass ground cover (17). The role of fire within the southern wintering grounds of Florida is presumably critical to maintaining favorable foraging habitat with frequent fire returns (<2-5 years).

Landscape/SpatialityTemporarity (Mobility, Area Sensitivity, Insularity-Connectivity Consideration)

The painted bunting is not evenly distributed across the landscape but rather is habitat dependent with disjunct breeding populations. This is more notable moving inland away from the immediate coast. The greatest breeding densities are on the barrier islands, the islands within the estuarine systems, and in suitable habitats on the immediate mainland adjoining the saline and brackish areas (5, 31). Eastern and western populations are apparently allopatric on the breeding as well as the wintering grounds. Some apparent range expansion has occurred along the Atlantic coast and in Florida (25, 28, 32).

Ideally painted bunting requires large areas from 1,200 to 2,500 acres to sustain a population of about 100 to 200 breeding pairs. Because painted bunting use many different habitats, it's possible to have this amount of suitable habitat in close proximity (17). Managed open pine and oak maritime forested areas are used but nesting eastern birds travel up to 0.5 miles to feed in grassy or marshy openings, while shrub-scrub birds remain in core areas (16). Breeding males in managed pine-oak forest spent time foraging communally in emergent marsh areas 0.16 to 0.4 miles outside defended territories (27). Furthermore, salt marsh/forest edge territories have been shown preferred over interior forest and were deemed of higher quality (13). Edge habitat patches of at least 2-10 acres (20 acres/breeding pair) located within 0.5 miles of emergent marsh is important.

Defended territory size in Georgia open oak-pine habitats on salt marsh edges were smaller (3.7-4.2 acres) than more inland oak-pine forest territories (5.2-6.7 acres), and PABU traveled regularly to the salt marsh to forage (8). Male home range sizes were smaller (7.7 acres) in maritime scrub-shrub habitat than managed

pine-oak forest habitat (17.3 acres) although female bunting home range sizes did not differ between habitats (27). Similar home range/territory size and habitat were found in South Carolina (14) and Georgia (13). Home range sizes tend to increase as canopy tree cover increases (27). Territory sizes in western inland habitats include 2.8 acres for one in Oklahoma (24) and an average of 7.8 acres in Missouri (20, 21). Territories tend to be larger when there are no other territories adjoining (20, 21), and smaller in high-quality habitat where territories are contiguous (8, 13). Males tend to return to nesting sites used in previous year and showed generally high between-year survival (13, 27).

Only 40% of variation in eastern painted bunting abundance at the site level can be explained based on acres of agricultural land, shrub-scrub land, emergent wetlands, and developed area in the surrounding landscape from 1960 and 1970s (16). However, by the early 1990s, the amount of emergent wetlands and developed area explained 35% of variation in total abundance. Agricultural land, in areas studied in Georgia and South Carolina, had declined so much that it no longer provided important habitat for breeding painted bunting, leaving emergent wetlands to provide what is believed to be a last refuge for the eastern breeding population, especially near developed areas (17, 18). Along breeding bird survey routes surveyed (1984-1995) in Kansas, Oklahoma, Texas, Missouri, Arkansas, and Louisiana, painted bunting abundance tended to be higher near irregularly shaped patches (fractal dimension), greater amounts of edge (edge density), and as closed forest patches increased in a landscape matrix otherwise dominated by open country (2). Adult painted bunting captures in Texas oak-prairie habitat were accurately predicted using landscape scale variables derived from National Land Cover Data (1992) around the sites that included extensive forest edge, and proportion of grassland, agricultural and water cover (22).

Landscapes intended to support both eastern and western populations will need to maintain early to mid-successional vegetation, with an emphasis on retaining a mix of open and wooded or shrubby components. Management should encourage a patchwork of shrubs and native grasses in the understory for PABU nesting and feeding habitat (19). In the southeast, protecting beach shrub-scrub and coastal wetland habitats will be important (16). The South Atlantic Coastal Plain Maritime Forest is described as a habitat with low natural fire frequency (10 to 15 year fire return interval) (12). However, the abundant grasses and shrubs beneath the open pine-oak forest canopy used for nesting by painted bunting at Sapelo Island, GA is maintained by periodic prescribed fire at four to six year intervals (17). Painted bunting populations will respond readily to land management practices that open the canopy to $\leq 50\%$ cover such as timber thinning, prescribed fire, and maintenance of shrub-scrub grasslands in transition areas (ecotones), such as beach dune habitats (17). Painted buntings in SC, TX and MS had an average increase of 0.16 males/2.5 acres after the first growing season where buffers of warm season grass-forbs-legumes were established around crop fields compared to control fields with no buffers (6). The most significant concern for the Atlantic coast populations is the transformation of valuable wetland and shrub-scrub habitats into intensive pine management and residential development (16), requiring protection of existing habitat.

Literature Cited

1. **American Ornithologists' Union (AOU). 1998.** Check-list of North American birds. Seventh edition. American Ornithologists' Union. Washington, DC. 829pp.
2. **Brennan, S. P. and G. D. Schnell. 2005.** Relationship between bird abundances and landscape characteristics: the influence of scale. *Environmental Monitoring and Assessment*. 105:209-228.
3. **Burleigh, T. D. 1958.** Georgia birds. University of Oklahoma Press, Norman, OK. 746 pp.
4. **Cox, J. 1996.** Painted Bunting. Pages 644-651 *In*. R. E. Ashton (ed.). Rare and endangered biota of Florida. University Press of Florida, Gainesville.
5. **Engels, W. L. 1952.** Vertebrate fauna of North Carolina coastal islands II. Shackleford Banks. *American Midland Naturalist* 47:702-742.
6. **Evans, K. O., W. Burger, M. D. Smith, and S. Riffel. 2006.** Conservation reserve program: bird monitoring and evaluation plan 2006 annual report. Mississippi State University, Starkville, MS 36pp.
7. **Fabrizio, L. and M. S. Calvi. 2003.** Georgia's marsh hammocks: a biological survey. Southern Environmental Law Center, Chapel Hill, NC. 24pp.
8. **Finke, M. A. 1979.** Territoriality and use of space by male painted buntings *Passerina ciris ciris* (L.). Master's Thesis. State University of NY College of Arts and Science at Genesco, New York, USA.
9. **Hobbs, M. and J. M. Meyers. 2004.** Painted bunting: A bird without equal – will it survive? Yes! We can make a difference. U.S. Geological Survey Patuxent Wildlife Research Center and U.S. Fish and Wildlife Service brochure and fact sheet. Available: http://www.fws.gov/Athens/factsheets/painted_bunting_brochure_for_public.pdf accessed 12/18/2008.
10. **Juarez-Berrios, E. A. 2004.** Habitat relationships of seven breeding bird species in the Leon River watershed investigated at local scales. Master's Thesis. Texas A&M University, College Station, TX. 113pp.
11. **Kopachena, J. G. and C. J. Crist. 2000.** Macro-habitat features associated with painted and indigo buntings in northeast Texas. *Wilson Bulletin* 112:108-114.
12. **LANDFIRE 2011.** LANDFIRE Vegetation product descriptions. South Atlantic Coastal Plain Maritime Forest (BpS 5513820). Available: <http://www.landfire.gov/NationalProductDescriptions20.php>. (Accessed: January 25, 2011).
13. **Lanyon, S.M. and C.F. Thompson. 1986.** Site fidelity and habitat quality as determinants of settlement pattern in male painted buntings. *Condor* 88:206-210.
14. **Latshaw, S. 2007.** Identifying habitat need of the painted bunting (*Passerina ciris*) on Kiahwah Island: radio telemetry pilot project. Kiawah Island Natural Habitat Conservancy, Kiawah Island, SC. 19pp.
15. **Lowther, P. E., S. M. Lanyon, and C. W. Thompson. 1999.** Painted bunting (*Passerina ciris*). Pages 1-24 *In*. A. Poole and F. Gill (eds.). The birds of North America, No. 398. The Birds of North America, Inc., Philadelphia, PA.
16. **Meyers, J.M. 1999.** Effects of landscape changes on the Painted Bunting population in the southeastern United States from 1966-1996 (progress report). US Geological Survey, Biological Resources Division, Reston, VA. Available: <http://www.pwrc.nbs.gov/research/sis98/meyers2s.htm>. (Accessed: December 1999).
17. **Meyers, J.M. 2004.** Bird without an equal: the story of Georgia's painted bunting. USGS Patuxent Wildlife Research Center, Laurel, Maryland, USA. <http://www.pwrc.usgs.gov/pabu>.
18. **Meyers, J. M., D. H. White, and C. B. Kepler. 1999.** Habitat selection, productivity and survival of shrub-scrub neotropical migratory birds in the southeastern United States (progress report). U.S. Geological Survey, Biological Resources Division, Reston, VA. Available: <http://www.pwrc.nbs.gov/research/sis98/meyers1s.htm>. (Accessed: December 1999).

19. **NatureServe. 2011.** NatureServe Explorer: an online encyclopedia of life [web application]. Version 7.0. NatureServe, Arlington, Virginia. Available: <http://www.natureserve.org/explorer>. (Accessed: January 13, 2011)
20. **Norris, D. J. 1982.** Habitat ecology of the painted bunting on the Ozark Plateau. Master's Thesis, University of Missouri-Columbia, Columbia.
21. **Norris, D. J. and W. H. Elder. 1982.** Distribution and habitat characteristics of the painted bunting in Missouri. *Transactions of the Missouri Academy of Science* 16:77-83.
22. **Nott, M. P. and N. Michel. 2005.** Management strategies for reversing declines in landbirds of conservation concern on military installations: *predictive modeling of landbird populations on military installations*. Report to the Dept. of Defense Legacy Resources Management Program, Project Number 03-103. 93pp.
23. **Oberholser, H. C. 1974.** The bird life of Texas. Volume 2. University of Texas Press. Austin, Texas, USA.
24. **Parmalee, D. F. 1959.** The breeding behavior of the painted bunting in southern Oklahoma. *Bird-Banding* 30:1-18.
25. **Potter, E. F., J. F. Parnell, and R. P. Teulings. 1980.** Birds of the Carolinas. Univ. North Carolina Press, Chapel Hill. 408pp.
26. **Ridgely, R. S., T. F. Allnutt, T. Brooks, T. K. McNicol, D. W. Mehlman, B. E. Young, and J. R. Zook. 2003.** Digital distribution maps of the birds of the Western Hemisphere, version 1.0. NatureServe, Arlington, Virginia, USA.
27. **Springborn, E. G. and J. M. Meyers. 2005.** Home range and survival of breeding painted buntings on Sapelo Island, Georgia. *Wildlife Society Bulletin* 33:1432-1439.
28. **Stevenson, H. M. and B. H. Anderson. 1994.** The birdlife of Florida. University Press of Florida, 891pp.
29. **Stiles, F. G. and A. F. Skutch. 1989.** A guide to the birds of Costa Rica. Cornell University Press, Ithaca, New York, USA. 511pp.
30. **Sykes, P. W., Jr., and J.M Meyers. 1999.** Annual survival in the southeastern coastal breeding population of the painted bunting (progress report). US Geological Survey, Biological Resources Division, Reston, VA. <http://cristel.nal.usda.gov>.
31. **Sykes, P. W, Jr. and S. Holzman. 2005.** Current range of the eastern painted bunting (*Passerina ciris*) Part 1: breeding. *North American Birds* 59:4-17.
32. **Sykes, P. W. Jr., S. Holzman, and E. E. Inigo-Elias. 2007.** Current range of the eastern population of painted bunting (*Passerina ciris*) Part II: winter range. *North American Birds* 61:378-406.
33. **Taylor, W. K., B. H. Anderson, and H. M. Stevenson. 1989.** Breeding range extension of the Indigo Bunting, Painted Bunting, and Blue Grosbeak in Florida with new records for Seminole County. *Florida Field Naturalist* 17:1-10.
34. **Terres, J. K. 1980.** The Audubon Society encyclopedia of North American birds. Alfred A. Knopf, New York.
35. **Thompson, C. W. 1991a.** Is the painted bunting actually two species? Problems determining species limits between allopatric populations. *Condor* 93:987-1000.
36. **Thompson, C. W. 1991b.** The sequence of molts and plumages in painted buntings and implications for theories of delayed plumage maturation. *Condor* 93:209-235.
37. **Womer, D. B. 1987.** Breeding habitat analysis of the indigo bunting (*Passerina cyanea*) and the painted bunting (*Passerina ciris*) in east Texas. Master's Thesis, Stephen F. Austin State Univ., Nacogdoches, TX.