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Recommended Plantings for Migratory Songbird Habitat Management

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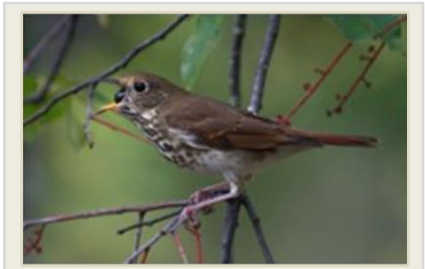

This version of the factsheet was inspired by conversations among the participants of a special symposium on fruit chemistry at the 2014 annual meeting of the Wilson Ornithological Society in Newport, RI. The importance of habitats that provide abundant fruits for birds, like the coastal shrubland shown above on Block Island RI, was emphasized at the session.

Seasonal wild fruits are an important food resource for migratory songbirds as they migrate south each fall along the east coast of the U.S. This region is a major migration corridor for songbirds as they travel from their northern breeding grounds to their southern wintering areas. During these annual migrations songbirds require habitats that contain easily located and nutritionally adequate foods so they can refuel their energy tanks and continue migration, all the while alleviating the oxidative stresses associated with long-distance migration. Thus, the availability of high-quality and abundant food resources, like fruits, in coastal and inland regions of the Northeastern U.S. is critical for successful migration of songbirds.

Most songbirds can utilize seasonal fruits that ripen in late summer and are available throughout the fall season. The ideal fruit diet for migratory birds would allow birds to rapidly replenish their energy, protein, and antioxidant stores in preparation for their next migratory flight.

However, fruits differ in their nutrient and energy content and most are relatively low in protein. Therefore we recommend offering birds a diversity of fruits so they can satisfy their nutritional needs (**Table 1**). Although a few introduced plant species produce fruits that may be consumed by wild birds, we restrict our recommendations to native plant species whose fruits are eaten by many bird species and that provide nutritional benefits to birds.

These recommendations are based on measured nutritional and biochemical composition of fruits, estimated nutritional requirements of birds, and bird preference experiments in which birds choose between several choices of fruits. Some of the recommended fruits, such as Arrowwood, are high-energy fruits that allow birds to rapidly refuel and have superior antioxidant properties that may help birds to alleviate the oxidative stresses incurred during migration (**Table 1A**). Other recommended fruits, such as Serviceberry, have less fat (and so have less energy than Arrowwood) but may offer complementary nutrients like carbohydrates (**Table 1B)**. Some waxy fruits, like Northern Bayberry, or less palatable fruits, like hollies, may only be utilized by a subset of migrants (i.e. Yellow-rumped Warblers, Cedar Waxwings) but these fruits persist and thus may also provide a good food resource for overwintering birds (**Table 1C**). This is why we recommend planting a variety of bird-consumed fruiting shrubs to create the best habitat for songbirds.

Table 1

Recommended native fruiting shrubs that can enhance habitat for migratory songbirds in the NE U.S.

Given a diversity of plant species is needed to satisfy the requirements of migrating songbirds, we suggest planting or encouraging the growth of at least two species from the "Highly recommended" list plus plant species from the other lists when possible. Many of these species are becoming more widely available to the public at local nurseries. Please consult your local greenhouse or horticulturist for advice on which plant species are best for your growing area.

A. Highly recommended and preferred by migratory songbirds:

		Nutrient Content[1]			Antioxidant Properties[2]			
Common Name	**Scientific Name**	**Fat**	**Carbs**	**Energy**	**Antho.[a]**	**Vit E[b]**	**Phenols**	**TAC[c]**
Arrowwood Viburnum	*Viburnum dentatum*	*High	High	High	High	High	High	High
Virginia Creeper	*Parthenocissus quinquefolia*	Med	High	High	Med	Low	High	High
Gray Dogwood	*Cornus racemosa*	High	Med	High	Low	N/A	Med	Low
Silky Dogwood	*Cornus amomum*	Low	High	Med	Med	N/A	Med	Low
Red Osier Dogwood	*Cornus sericea*	*Med	Med	High	Low	N/A	Med	Low

B. Recommended and eaten by many migratory songbirds:

Serviceberry	*Amelanchier spp.*	*Low	High	Med
Common Elderberry	*Sambucus canadensis*	Low	High	Med
Spicebush	*Lindera benzoin*	High	Low	High
Pokeweed	*Phytolacca americana*	Low	High	Low
Flowering Dogwood	*Cornus florida*	Med	Med	High
Chokecherry	*Prunus virginiana*	*Low	High	Low
Highbush Blueberry	*Vaccinium corymbosum*	*Low	High	Low

Antioxidants and Birds

Birds during migration experience oxidative stress when they burn fats to fuel their flights. Fruits with *high antioxidant capacity* can help to alleviate these stresses.

Vitamin E and *phenols in fruits*, especially colored compounds called *anthocyanins* that give fruits their bright purple-maroon coloration, are good dietary sources of antioxidants for birds.

C. Recommended and eaten by a few migratory songbirds and overwintering birds:

Northern Bayberry	*Myrica pennsylvanica*	*High	High	High
Winterberry	*Ilex verticillata*	*Low	High	Med
Black Chokeberry	*Aronia melanocarpa*	Low	High	Med
Mapleleaf Viburnum	*Viburnum acerifolium*	*Low	Low	Med
Nannyberry	*Viburnum lentago*	*Low	Med	Low

[1] Nutrient Content for fat and carbohydrates (carbs) is "High" if >35% dry wt, "Med" if btw 10-35% and "Low" if <10%. Energy density is "High" if >21 kJ/g dry wt, "Med" if btw 18-21kJ/g and "Low" if <18kJ/g. From Smith et al. 2007 (Wilson Journal of Ornithology 119: 419-428), Smith et al. 2013 (Northeastern Naturalist 20:171-184), and White 1989 (PhD dissertation, Rutgers).

NOTE: protein content of all fruits is adequate for birds during the migratory period, but "" indicates fruits that have inadequate protein content for birds during other times of the year (Langlois and McWilliams 2010, The Auk 127: 850-862).

[2] Designated values are relative rankings based on Bolser et al. 2013 (Wilson Journal of Ornithology 125:97-108) and Smith et al. unpublished. "N/A" means information is not available. **a.** Refers to anthocyanins and other water-soluble antioxidants, **b.** Refers to vitamin E and other lipid-soluble antioxidants, and **c.** refers to Total Antioxidant Capacity as measured by TEAC or DPPH method.

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