

Site Evaluation and Species Lists

Based On Observations Made During The Big Year Eco-Challenge Project

January 1 –December 31, 2021

Tall Pines State Preserve, Deptford and Mantua Townships, New Jersey

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Based on observations made during the Big Year Eco-Challenge project (Jan. 1 –Dec.31, 2021)

Tall Pines State Preserve, Deptford and Mantua Townships, New Jersey

Site Description

Tall Pines State Preserve is a 110 acre state park, established in 2016, that had previously been a golf course, and is presently undergoing natural successional changes in vegetation as plants colonize the former greens and fairways. Mantua Creek, a tributary of the Delaware, runs east to west through a broad deep stream valley in the center of the Preserve. In addition to the creek, the stream valley contains three small connected ponds, created as water features during the golf course period. The western most of the ponds was used as a source for irrigation. Partly forested freshwater wetlands are also present in the stream valley. The steep sides of the stream valley support mature deciduous forest. Oak, tulip tree, hickory and beech are the dominant tree species. The well drained rolling uplands south of the stream valley, in Mantua Township, and north of the stream valley, in Deptford Township, make up the remainder of the Preserve, approximately two thirds of the Preserve in area. The Deptford uplands incline in a gentle slope toward the stream valley, while the Mantua uplands exhibit a more rolling and hilly topography. Portions of the Preserve uplands consist of open meadow dominated by grasses, goldenrod, boneset and aster. Much of the uplands have transitioned from open meadow to successional scrub, dominated by eastern white pine, Virginia pine, eastern red cedar and silver maple. The seed for the spread of the eastern white pine and silver maple came from mature specimens of these species, planted during the golf course era. Non-native invasives are also prominent in the uplands and include callery pear, tree of heaven, oriental bittersweet and mugwort.

Site History

The original condition of the site was presumably deciduous forest. The Deptford uplands were cleared for agricultural use many decades ago. One source indicates the site was used for asparagus cultivation in the early 20th century. In the early 1950's the Deptford uplands were converted to a 9 hole golf course. The Mantua uplands remained largely forested until the mid-1960's, when much of the area was cleared and an additional 9 hole course was constructed. The golf course passed through several owners and was operated under the names Tall Pines, Ron Jaworski's Eagles Nest and finally Maple Ridge. The golf course closed in Dec 2006. Since that time the land has largely been left to the forces of nature, apart from the mowing and maintaining of walking trails and bridges. The land was purchased for preservation and The Tall Pines State Preserve was dedicated in June 2016.

Big Year Eco-Challenge at Tall Pines

The Big Year Eco-Challenge is a project that was undertaken between Jan. 1 and Dec. 31, 2021 at 8 publicly accessible preserved natural areas, including Tall Pines State Preserve, to investigate and document as many of the species of organisms present at these sites as possible. This activity is sometimes referred to as a bio-blitz. The BYEC is a joint project of the Monarch Teacher Network and the Gloucester County Nature Club, and has received funding from the October Hill Foundation.

BYEC Methodology at Tall Pines

A team of amateur naturalists and observers was assembled to conduct the investigation and given field and classroom training. The observers then, over the full year of 2021, made frequent visits to Tall Pines to identify and document species. Observations were done by what has been called “random cruising” rather than by the use of grids or other scientific survey methods. A species of plant, bird, insect, fungus, etc. was documented by “making an observation”, which consisted of a digital photograph or audio recording. Observers sometimes made group excursions to Tall Pines but more often made solitary visits according to their own schedule. Over the course of the year, there were hundreds of visits by observers covering all seasons, times of day and weather conditions.

The second component of the BYEC was the collection and organization of the observations, and establishment of the correct species identification. This was accomplished through the website and online naturalist community of iNaturalist.org.

Research Grade and below Research Grade Observations on iNaturalist.

Observations made at Tall Pines were uploaded to iNaturalist where they can be reviewed and analyzed by BYEC checkers and by the larger online naturalist community. Once the species of an observation is confirmed by this process, referred to on iNaturalist as CommunityTaxon, and meets the other requirements of a verifiable date, time, location and is determined not to be captive, it is termed *Research Grade*. CommunityTaxon requires at least two agreeing identifications of the observation or agreement of at least 2/3 of the identifiers if the identifications are not unanimous. When an observation does not meet this review standard, it is relegated to below Research Grade status, referred to as *Casual* and labeled as “Needs ID”.

Creating the Species Lists.

The majority of the Tall Pines observations are Research Grade but a significant minority of the observations remains at below Research Grade status. Many of those are below Research Grade simply from a lack of review, rather from the absence of identification or any disagreements on identification. This created the dilemma of how to deal with these two separate sets of data collected at Tall Pines: Research Grade observations and below Research Grade observations. There were three possible approaches: 1. Lump all the observations into a species list regardless of their iNaturalist status. This approach was rejected as it would seriously degrade the integrity of a list to include verified and unverified data without distinction. 2. Disregard all below RG observations. This also was rejected. The purpose of this report is to document and present as completely as possible what organisms observers actually encountered at Tall Pines. To exclude the below Research Grade observations would give a

diminished and incomplete picture of what was seen and what actually exists at Tall Pines. 3. A third option was chosen. Present the species in two separate and identified sets of lists; Research Grade and below Research Grade. Undoubtedly, the below Research Grade lists could well contain erroneous identifications and are to be viewed at a lower level of reliability. Identifications on these lists should be considered as possible and tentative until such time that they can be confirmed or corrected. Not all below Research Grade observations were included in the lists. Only those that had a fairly specific suggested identification and in which the photograph had sufficient detail that a person knowledgeable in the field could likely make or confirm an identification were included in the below Research Grade lists.

During the course of the BYEC at Tall Pines, 2,868 observations were made and 1,006 species were documented. The Tall Pines BYEC observers make no claim that this series of inventories is comprehensive and complete. Tall Pines undoubtedly contains many species not documented in the project. The observations were based on what the observers saw or heard at given locations at specific times. Many ephemeral appearances of species, such as a migrating warbler passing through or a fungus fruiting body could easily be missed. Also animals that are primarily nocturnally active, such as bats and fireflies, are less likely to be seen. Finally, those organisms that are inconspicuous due to their lifestyle or size, such as soil dwelling insects or aquatic macro invertebrates are a challenge to observe and document. What is important is that this project has documented a great deal of what is here, particularly regarding the plant species, and for the first time provides data on insects, fungi and other organisms at Tall Pines.

The members of the team of BYEC observers for Tall Pines were (listed alphabetically):

Scott Barnes
Carly Chaapel
Christine Chaapel
Rich Dilks
Marie Hageman
Chris Herz
Nicole Lloyd
Annabelle Ream
Brooke Ream

Principal BYEC investigator, Jeff Mollenhauer, also contributed observations at Tall Pines.

Management Suggestions

There are three general topics of ecological concern that should be explored:

1. Mowing. There are two purposes for mowing at Tall Pines. The first is trail maintenance, where unpaved trails in grassy areas and the borders of the paved trails are mowed on a regular schedule during the growing season. The second is the use of mowing as a part of habitat maintenance to preserve open meadows. In the absence of this type of mowing the normal successional stages of the land will eventually result in all open areas becoming forested. A plan for habitat mowing needs to be

developed that will preserve the habitat diversity of Tall Pines with meadow, scrublands, young forest and mature forest all present. The mowing to preserve meadow habitat need be done only once every one to three years. It would be done in fall or late winter, when ground nesting birds and other wildlife would not be raising young, and after the meadow plants had seasonally matured, flowered and set seed.

2. Invasive Species. An area such as Tall Pines, which is transitioning from human disturbance (in this case the mowed grasses of a golf course) to a more natural state, creates attractive habitats for non-native species, as well as native successional colonizers. A number of these non-natives are aggressive enough to be considered invasive and a threat to maintaining or establishing functioning ecological habitats and biodiversity. Chief among these invasive species at Tall Pines are callery pear, oriental bittersweet, tree of heaven and mile-a minute. The first three woody species are scattered throughout much of the upland areas of Tall Pines, but are much more prevalent in the Deptford (northern) portion of Tall Pines. The annual vine, mile-a-minute, is present on and adjoining some areas of wetlands in the stream valley and also in some upland areas. Because of its ability to spread rapidly, its control should be prioritized. In addition, the spotted lanternfly has established a sizable population at Tall Pines. This may be due, in part, to the presence in the Preserve of the tree of heaven, a preferred host for the insect. The long term ecological diversity of Tall Pines will depend on management policies that can contain the threat of these and other non-native colonizers.

3. Habitat Restoration. The upland areas of Tall Pines are not a preserved natural ecosystem, but a place severely affected historically by human disturbance (agriculture, golf course) that is now naturalizing. The next logical step after the control and containment of aggressive invasive species is the restoration of native species of trees, shrubs, grasses and pollinator friendly meadow plants. Increasing the number and diversity of native plants in the upland areas is the best way of achieving ecological diversity for insects, birds and other organisms. The lowland areas around the ponds and Mantua Creek are less affected by invasives but could also benefit from native plant restorations. The forested areas of Tall Pines have a fairly high higher number of native trees, shrubs and forbs.

Plant Communities of Tall Pines State Preserve

(This section is under construction by Nicole Lloyd and expected to be completed by late summer 2022.)

Tall Pines Species Lists

Plants (Kingdom Plantae)

Trees and shrubs

iNaturalist tree & shrub Species Assigned Research Grade

<u>Botanical Name</u>	<u>Common Name</u>	<u>C-value/non-native</u>	<u>Family</u>
Acer negundo	boxelder	2	Sapindaceae
Acer platanoides	Norway maple	non-native	Sapindaceae
Acer rubrum	red maple	3	Sapindaceae
Acer saccharinum	silver maple	5	Sapindaceae
Ailanthus altissima	tree-of-heaven	non-native	Simaroubaceae
Albizia julibrissin	Persian silk tree	non-native	Fabaceae
Alnus serrulata	smooth alder	4	Betulaceae
Ampelopsis glandulosa	porcelain berry	non-native	Vitaceae
Berberis thunbergii	Japanese barberry	non-native	Berberidaceae
Betula populifolia	gray birch	3	Betulaceae
Carpinus caroliniana	American hornbeam	7	Betulaceae
Carya glabra	pignut hickory	6	Juglandaceae
Carya tomentosa	mockernut hickory	5	Juglandaceae
Castanea dentata	American chestnut	5	Fagaceae
Catalpa speciosa	northern catalpa	non-native	Bignoniaceae
Celtis occidentalis	common hackberry	5	Cannabaceae
Chamaecyparis thyoides	Atlantic white cedar	9	Cupressaceae
Clethra alnifolia	sweet pepperbush	5	Clethraceae
Cornus amomum	silky dogwood	5	Cornaceae
Cornus florida	flowering dogwood	5	Cornaceae
Elaeagnus angustifolia	Russian olive	non-native	Elaeagnaceae
Elaeagnus umbellata	autumn olive	non-native	Elaeagnaceae
Euonymus alatus	winged euonymus	non-native	Celastraceae
Fagus grandifolia	American beech	6	Fagaceae
Forsythia × intermedia	border Forsythia	non-native	Oleaceae
Fraxinus pennsylvanica	green ash	5	Oleaceae
Gleditsia triacanthos	honey locust	non-native	Fabaceae
Ilex opaca	American holly	4	Aquifoliaceae
Juglans nigra	eastern black walnut	3	Juglandaceae
Juniperus virginiana	eastern redcedar	2	Cupressaceae
Kalmia latifolia	mountain laurel	6	Ericaceae
Ligustrum obtusifolium	border privet	non-native	Oleaceae
Liquidambar styraciflua	American sweetgum	3	Altingiaceae

<i>Liriodendron tulipifera</i>	tulip tree	5	Magnoliaceae
<i>Lonicera fragrantissima</i>	winter honeysuckle	non-native	Caprifoliaceae
<i>Lonicera maackii</i>	Amur honeysuckle	non-native	Caprifoliaceae
<i>Lonicera morrowii</i>	Morrow's honeysuckle	non-native	Caprifoliaceae
<i>Malus domestica</i>	apple	non-native	Rosaceae
<i>Morus alba</i>	white mulberry	non-native	Moraceae
<i>Nyssa sylvatica</i>	black tupelo	4	Nyssaceae
<i>Picea abies</i>	Norway spruce	non-native	Pinaceae
<i>Pinus echinata</i>	shortleaf pine	6	Pinaceae
<i>Pinus strobus</i>	eastern white pine	5	Pinaceae
<i>Pinus virginiana</i>	Virginia pine	3	Pinaceae
<i>Platanus occidentalis</i>	American sycamore	4	Platanaceae
<i>Populus × jackii</i>	Balm-of-Gilead	non-native	Salicaceae
<i>Prunus × subhirtella</i>	rosebud cherry	non-native	Rosaceae
<i>Prunus persica</i>	peach	non-native	Rosaceae
<i>Prunus serotina</i>	black cherry	2	Rosaceae
<i>Pyrus calleryana</i>	callery pear	non-native	Rosaceae
<i>Quercus alba</i>	white oak	4	Fagaceae
<i>Quercus falcata</i>	southern red oak	6	Fagaceae
<i>Quercus marilandica</i>	blackjack oak	6	Fagaceae
<i>Quercus montana</i>	chestnut oak	5	Fagaceae
<i>Quercus palustris</i>	pin oak	4	Fagaceae
<i>Quercus phellos</i>	willow oak	6	Fagaceae
<i>Quercus stellata</i>	post oak	6	Fagaceae
<i>Quercus velutina</i>	black oak	5	Fagaceae
<i>Rhododendron periclymenoides</i>	pinxter flower	5	Ericaceae
<i>Rhus copallinum</i>	shining sumac	2	Anacardiaceae
<i>Rhus glabra</i>	smooth sumac	2	Anacardiaceae
<i>Rosa multiflora</i>	multiflora rose	non-native	Rosaceae
<i>Rubus occidentalis</i>	black raspberry	3	Rosaceae
<i>Rubus phoenicolasius</i>	wineberry	non-native	Rosaceae
<i>Salix nigra</i>	black willow	4	Salicaceae
<i>Sambucus canadensis</i>	black elderberry	4	Viburnaceae
<i>Sassafras albidum</i>	sassafras	2	Lauraceae
<i>Smilax rotundifolia</i>	roundleaf greenbrier	2	Smilacaceae
<i>Thuja occidentalis</i>	northern whitecedar	non-native	Cupressaceae
<i>Ulmus americana</i>	American elm	6	Ulmaceae
<i>Vaccinium corymbosum</i>	northern highbush blueberry	5	Ericaceae
<i>Viburnum dentatum</i>	southern arrowwood	5	Viburnaceae
<i>Viburnum dilatatum</i>	linden viburnum	non-native	Viburnaceae

iNaturalist tree & shrub Species Below Research Grade

Botanical Name	Common Name	C-value/non-native	Family
Alnus incana	gray alder	6	Betulaceae
Betula sp.	birch sp.		Betulaceae
Corylus americana	American hazelnut	5	Betulaceae
Deutzia scabra	deutzia	non-native	Hydrangeaceae
Gaylussacia baccata	black huckleberry	5	Ericaceae
Ligustrum vulgare	common privet	non-native	Oleaceae
Prunus serrulata	Japanese cherry	non-native	Rosaceae
Quercus rubra	northern red oak	5	Fagaceae
Rubus allegheniensis	Allegheny blackberry	3	Rosaceae
Taxus sp.	yew	Non-native	Taxaceae
Vaccinium angustifolium	lowbush blueberry	7	Ericaceae

Total number of tree & shrub species 84.

54 native and 30 non-native.

Tree and shrub families

Species representing 33 tree and shrub families were found at Tall Pines in this survey.

Forbs

iNaturalist Forb Species Assigned Research Grade

Botanical Name	Common Name	C-value/non-native	Family
Acalypha rhomboidea	common copperleaf	1	Euphorbiaceae
Achillea millefolium	common yarrow	non-native	Asteraceae
Ageratina altissima	white snakeroot	3	Asteraceae
Alliaria petiolata	garlic mustard	non-native	Brassicaceae
Allium vineale	wild garlic	non-native	Amaryllidaceae
Ambrosia artemisiifolia	common ragweed	1	Asteraceae
Ambrosia trifida	giant ragweed	2	Asteraceae
Amphicarpaea bracteata	American hog-peanut	4	Fabaceae
Apocynum androsaemifolium	spreading dogbane	3	Apocynaceae
Apocynum cannabinum	hemp dogbane	2	Apocynaceae
Arabidopsis thaliana	mouse-ear cress	non-native	Brassicaceae
Aralia nudicaulis	wild sarsaparilla	5	Araliaceae
Arctium lappa	greater burdock	non-native	Asteraceae
Arctium minus	lesser burdock	non-native	Asteraceae
Arisaema triphyllum	Jack-in-the-pulpit	5	Araceae

<i>Artemisia vulgaris</i>	common mugwort	non-native	Asteraceae
<i>Asclepias incarnata</i>	swamp milkweed	5	Apocynaceae
<i>Asclepias syriaca</i>	common milkweed	1	Apocynaceae
<i>Asclepias tuberosa</i>	butterfly milkweed	1	Apocynaceae
<i>Barbarea vulgaris</i>	garden yellowrocket	non-native	Brassicaceae
<i>Bidens bipinnata</i>	Spanish needles	1	Asteraceae
<i>Boehmeria cylindrica</i>	false nettle	4	Urticaceae
<i>Calystegia sepium</i>	hedge bindweed	2	Convolvulaceae
<i>Capsella bursa-pastoris</i>	shepherd's-purse	non-native	Brassicaceae
<i>Cardamine bulbosa</i>	bulbous cress	7	Brassicaceae
<i>Cardamine hirsuta</i>	hairy bittercress	non-native	Brassicaceae
<i>Centaurea stoebe</i>	spotted knapweed	non-native	Asteraceae
<i>Cerastium fontanum</i>	mouse-ear chickweed	non-native	Caryophyllaceae
<i>Chamaecrista nictitans</i>	sensitive pea	2	Fabaceae
<i>Chelidonium majus</i>	greater celandine	non-native	Papaveraceae
<i>Chenopodium album</i>	common lambsquarters	non-native	Amaranthaceae
<i>Chimaphila maculata</i>	striped wintergreen	5	Ericaceae
<i>Cichorium intybus</i>	chicory	non-native	Asteraceae
<i>Cicuta maculata</i>	water hemlock	5	Apiaceae
<i>Circaea canadensis</i>	broadleaf enchanter's nightshade	3	Onagraceae
<i>Cirsium vulgare</i>	bull thistle	non-native	Asteraceae
<i>Claytonia virginica</i>	Virginia spring beauty	5	Montiaceae
<i>Clematis terniflora</i>	autumn clematis	non-native	Ranunculaceae
<i>Clematis virginiana</i>	virgin's-bower	5	Ranunculaceae
<i>Commelina communis</i>	Asiatic dayflower	non-native	Commelinaceae
<i>Coreopsis lanceolata</i>	lance-leaved coreopsis	non-native	Asteraceae
<i>Crocanthemum canadense</i>	Canada frostweed	5	Cistaceae
<i>Croton glandulosus</i>	tropic croton	non-native	Euphorbiaceae
<i>Cryptotaenia canadensis</i>	honewort	5	Apiaceae
<i>Daucus carota</i>	Queen Anne's lace	non-native	Apiaceae
<i>Desmodium paniculatum</i>	panicled ticktrefoil	4	Fabaceae
<i>Desmodium perplexum</i>	perplexed tick-trefoil	6	Fabaceae
<i>Dianthus armeria</i>	Deptford pink	non-native	Caryophyllaceae
<i>Epifagus virginiana</i>	beechdrops	6	Orobanchaceae
<i>Erechtites hieraciifolius</i>	fireweed	2	Asteraceae
<i>Erigeron annuus</i>	annual fleabane	1	Asteraceae
<i>Erigeron canadensis</i>	horseweed	1`	Asteraceae
<i>Erigeron philadelphicus</i>	Philadelphia fleabane	2	Asteraceae
<i>Erodium cicutarium</i>	redstem stork's-bill	non-native	Geraniaceae
<i>Erythronium americanum</i>	yellow trout lily	5	Liliaceae
<i>Eupatorium hyssopifolium</i>	hyssopleaf thoroughwort	2	Asteraceae
<i>Eupatorium serotinum</i>	late boneset	1	Asteraceae
<i>Euphorbia cyparissias</i>	cypress spurge	non-native	Euphorbiaceae

<i>Euphorbia maculata</i>	Spotted spurge	1	Euphorbiaceae
<i>Euphorbia nutans</i>	nodding spurge	1	Euphorbiaceae
<i>Eurybia divaricata</i>	White Wood Aster	5	Asteraceae
<i>Euthamia graminifolia</i>	flat-topped goldenrod	2	Asteraceae
<i>Fallopia scandens</i>	climbing false buckwheat	2	Polygonaceae
<i>Ficaria verna</i>	lesser celandine	non-native	Ranunculaceae
<i>Fragaria virginiana</i>	Virginia strawberry	3	Rosaceae
<i>Froelichia gracilis</i>	slender snakecotton	non-native	Amaranthaceae
<i>Galium aparine</i>	catchweed bedstraw	2	Rubiaceae
<i>Geranium carolinianum</i>	Carolina crane's-bill	1	Geraniaceae
<i>Geranium pusillum</i>	small-flowered crane's-bill	non-native	Geraniaceae
<i>Geum canadense</i>	white avens	5	Rosaceae
<i>Geum virginianum</i>	cream-colored avens	7	Rosaceae
<i>Glechoma hederacea</i>	ground-ivy	non-native	Lamiaceae
<i>Hackelia virginiana</i>	stickseed	3	Boraginaceae
<i>Helianthus giganteus</i>	giant sunflower	6	Asteraceae
<i>Hemerocallis fulva</i>	orange day-lily	non-native	Asphodelaceae
<i>Heterotheca subaxillaris</i>	camphorweed	non-native	Asteraceae
<i>Hexasepalum teres</i>	rough buttonweed	1	Rubiaceae
<i>Hibiscus moscheutos</i>	swamp rose mallow	5	Malvaceae
<i>Hieracium venosum</i>	rattlesnakeweed	7	Asteraceae
<i>Hosta asp.</i>	hostas	non-native	Asparagaceae
<i>Humulus scandens</i>	Japanese hops	non-native	Cannabaceae
<i>Hypericum perforatum</i>	common St. John's-wort	non-native	Hypericaceae
<i>Hypochaeris radicata</i>	common cat's-ear	non-native	Asteraceae
<i>Impatiens capensis</i>	common jewelweed	3	Balsaminaceae
<i>Ipomoea hederacea</i>	ivy-leaved morning-glory	non-native	Convolvulaceae
<i>Iris domestica</i>	blackberry lily	non-native	Iridaceae
<i>Iris sp.</i>	Irises	non-native	Iridaceae
<i>Kummerowia striata</i>	Japanese clover	non-native	Fabaceae
<i>Lactuca biennis</i>	tall blue lettuce	3	Asteraceae
<i>Lactuca canadensis</i>	Canada wild lettuce	2	Asteraceae
<i>Lamium amplexicaule</i>	henbit deadnettle	non-native	Lamiaceae
<i>Lamium purpureum</i>	red deadnettle	non-native	Lamiaceae
<i>Laportea canadensis</i>	wood nettle	6	Urticaceae
<i>Lepidium campestre</i>	field peppergrass	non-native	Brassicaceae
<i>Lepidium virginicum</i>	Virginia pepperweed	1	Brassicaceae
<i>Lespedeza capitata</i>	round-headed bush clover	3	Fabaceae
<i>Lespedeza cuneata</i>	Chinese bushclover	non-native	Fabaceae
<i>Leucanthemum vulgare</i>	oxeye daisy	non-native	Asteraceae
<i>Lobelia cardinalis</i>	cardinal flower	5	Campanulaceae
<i>Ludwigia peploides</i>	floating primrose-willow	non-native	Onagraceae
<i>Lycopus uniflorus</i>	northern bugleweed	4	Lamiaceae

<i>Lycopus virginicus</i>	sweet bugleweed	4	Lamiaceae
<i>Lysimachia ciliata</i>	fringed loosestrife	2	Primulaceae
<i>Lysimachia nummularia</i>	creeping Jenny	non-native	Primulaceae
<i>Lythrum salicaria</i>	purple loosestrife	non-native	Lythraceae
<i>Maianthemum canadense</i>	Canada mayflower	4	Asparagaceae
<i>Maianthemum racemosum</i>	Solomon's plume	5	Asparagaceae
<i>Melilotus albus</i>	white sweetclover	non-native	Fabaceae
<i>Mikania scandens</i>	climbing hempvine	3	Asteraceae
<i>Mitchella repens</i>	partridgeberry	5	Rubiaceae
<i>Mollugo verticillata</i>	green carpetweed	non-native	Molluginaceae
<i>Monarda punctata</i>	spotted horse mint	4	Lamiaceae
<i>Mummenhoffia alliacea</i>	garlic penny-cress	non-native	Brassicaceae
<i>Myosotis stricta</i>	blue scorpion grass	non-native	Boraginaceae
<i>Narcissus pseudonarcissus</i>	wild daffodil	non-native	Amaryllidaceae
<i>Nuttallanthus canadensis</i>	blue toadflax	2	Plantaginaceae
<i>Oenothera biennis</i>	common evening-primrose	1	Onagraceae
<i>Oenothera laciniata</i>	cutleaf evening primrose	2	Onagraceae
<i>Opuntia humifusa</i>	low pricklypear	5	Cactaceae
<i>Oxalis dillenii</i>	slender yellow woodsorrel	non-native	Oxalidaceae
<i>Persicaria arifolia</i>	halberd-leaved tearthumb	5	Polygonaceae
<i>Persicaria lapathifolia</i>	pale smartweed	non-native	Polygonaceae
<i>Persicaria longiseta</i>	low smartweed	non-native	Polygonaceae
<i>Persicaria pensylvanica</i>	pinkweed	2	Polygonaceae
<i>Persicaria perfoliata</i>	mile-a-minute weed	non-native	Polygonaceae
<i>Persicaria punctata</i>	dotted knotweed	5	Polygonaceae
<i>Persicaria sagittata</i>	arrow-leaved tearthumb	3	Polygonaceae
<i>Persicaria virginiana</i>	American jumpseed	4	Polygonaceae
<i>Phytolacca americana</i>	American pokeweed	1	Phytolaccaceae
<i>Pilea pumila</i>	Canada clearweed	3	Urticaceae
<i>Pilosella caespitosa</i>	meadow hawkweed	non-native	Asteraceae
<i>Pilosella officinarum</i>	mouse-eared hawkweed	non-native	Asteraceae
<i>Plantago lanceolata</i>	ribwort plantain	non-native	Plantaginaceae
<i>Plantago major</i>	greater plantain	non-native	Plantaginaceae
<i>Polygonatum biflorum</i>	smooth Solomon's seal	6	Asparagaceae
<i>Portulaca oleracea</i>	Common Purslane	non-native	Portulacaceae
<i>Potentilla indica</i>	mock strawberry	non-native	Rosaceae
<i>Potentilla recta</i>	sulphur cinquefoil	non-native	Rosaceae
<i>Potentilla simplex</i>	common cinquefoil	2	Rosaceae
<i>Pseudognaphalium obtusifolium</i>	sweet everlasting	3	Asteraceae
<i>Ranunculus abortivus</i>	small-flowered buttercup	2	Ranunculaceae
<i>Ranunculus bulbosus</i>	bulbous buttercup	non-native	Ranunculaceae
<i>Reynoutria japonica</i>	Japanese knotweed	non-native	Polygonaceae
<i>Rorippa palustris</i>	bog yellowcress	2	Brassicaceae

Rubus flagellaris	common dewberry	5	Rosaceae
Rumex acetosella	sheep's sorrel	non-native	Polygonaceae
Rumex obtusifolius	broad-leaved dock	non-native	Polygonaceae
Rumex verticillatus	swamp dock	6	Polygonaceae
Sagittaria latifolia	broadleaf arrowhead	4	Alismataceae
Senecio vulgaris	common groundsel	non-native	Asteraceae
Sicyos angulatus	bur-cucumber	3	Cucurbitaceae
Silene latifolia	white campion	non-native	Caryophyllaceae
Sisyrinchium angustifolium	narrow-leaved blue-eyed grass	5	Iridaceae
Solanum carolinense	Carolina horsenettle	non-native	Solanaceae
Solidago altissima	tall goldenrod	2	Asteraceae
Solidago gigantea	giant goldenrod	3	Asteraceae
Solidago rugosa	common wrinkle-leaved goldenrod	3	Asteraceae
Stachys byzantina	woolly hedgenettle	non-native	Lamiaceae
Stellaria media	common chickweed	non-native	Caryophyllaceae
Strophostyles helvola	trailing fuzzy-bean	2	Fabaceae
Symphotrichum lanceolatum	panicked aster	4	Asteraceae
Symphotrichum lateriflorum	calico aster	4	Asteraceae
Symphotrichum pilosum	frost aster	1	Asteraceae
Symphotrichum racemosum	small white aster	3	Asteraceae
Symplocarpus foetidus	eastern skunk cabbage	5	Araceae
Taraxacum erythrospermum	red-seeded dandelion	non-native	Asteraceae
Taraxacum officinale	common dandelion	non-native	Asteraceae
Thalictrum pubescens	tall meadow-rue	5	Ranunculaceae
Tragopogon dubius	yellow salsify	non-native	Asteraceae
Trichostema dichotomum	blue curls	3	Lamiaceae
Trifolium arvense	rabbitfoot clover	non-native	Fabaceae
Trifolium campestre	hop trefoil	non-native	Fabaceae
Trifolium dubium	Lesser hop trefoil	non-native	Fabaceae
Trifolium pratense	red clover	non-native	Fabaceae
Trifolium repens	white clover	non-native	Fabaceae
Triodanis perfoliata	clasping Venus's looking glass	1	Campanulaceae
Typha latifolia	broad-leaved cattail	3	Typhaceae
Verbascum blattaria	moth mullein	non-native	Scrophulariaceae
Verbascum thapsus	great mullein	non-native	Scrophulariaceae
Verbena hastata	blue vervain	3	Verbenaceae
Verbena urticifolia	white vervain	2	Verbenaceae
Veronica hederifolia	Ivy-leaved speedwell	non-native	Plantaginaceae
Veronica persica	bird's-eye speedwell	non-native	Plantaginaceae
Vicia grandiflora	large yellow vetch	non-native	Fabaceae
Vicia lathyroides	spring vetch	non-native	Fabaceae
Vicia sativa	common vetch	non-native	Fabaceae

Vinca minor	lesser periwinkle	non-native	Apocynaceae
Viola arvensis	European field pansy	non-native	Violaceae
Viola blanda	sweet white violet	6	Violaceae
Viola sororia	common blue violet	3	Violaceae
Vicia hirsuta	hairy tare	non-native	Fabaceae

iNaturalist Forb Species Below Research Grade

<u>Botanical Name</u>	<u>Common Name</u>	<u>C-value/non-native</u>	<u>Family</u>
Barbarea sp.		Non-native	Brassicaceae
Brassica rapa	field mustard	non-native	Brassicaceae
Callitriche sp.	water starworts	5	Plantaginaceae
Cichorieae (tribe)			Asteraceae
Cirsium discolor	field thistle	1	Asteraceae
Erigeron strigosus	daisy fleabane	1	Asteraceae
Eutrochium dubium	coastal plain Joe-Pye weed	5	Asteraceae
Ipomoea pandurata	wild potato vine	4	Convolvulaceae
Lactuca serriola	prickly lettuce	non-native	Asteraceae
Lemna minor	common duckweed	3	Araceae
Ludwigia palustris	water purslane	2	Onagraceae
Myosotis sp.	forget-me-not		Boraginaceae
Persicaria maculosa	lady's thumb	non-native	Polygonaceae
Ranunculus acris	meadow buttercup	non-native	Ranunculaceae
Sanicula canadensis	black snakeroot	3	Apiaceae
Solidago juncea	early goldenrod	2	Asteraceae
Sparganium americanum	American bur-reed	6	Typhaceae
Symphyotrichum cordifolium	common blue wood aster	5	Asteraceae
Tragopogon pratensis	meadow salsify	non-native	Asteraceae

Total number forb species 210.

115 native and 95 non-native.

Forb families

Species representing 51 forb families were found at Tall Pines in this survey.

Woody Vines

iNaturalist woody vine Species Assigned Research Grade

<u>Botanical Name</u>	<u>Common Name</u>	<u>C-value/non-native</u>	<u>Family</u>
Campsis radicans	American trumpet vine	2	Bignoniaceae
Celastrus orbiculatus	Asian bittersweet	non-native	Celastraceae
Hedera helix	common ivy	non-native	Araliaceae
Lonicera japonica	Japanese honeysuckle	non-native	Caprifoliaceae
Parthenocissus quinquefolia	Virginia creeper	2	Vitaceae
Toxicodendron radicans	poison ivy	1	Anacardiaceae
Vitis aestivalis	summer grape	5	Vitaceae
Wisteria floribunda	Japanese wisteria	non-native	Fabaceae

iNaturalist woody vine Species Below Research Grade

<u>Botanical Name</u>	<u>Common Name</u>	<u>C-value/non-native</u>	<u>Family</u>
Wisteria sinensis	Chinese wisteria	non-native	Fabaceae

Total number of woody vine species 9.

4 native and 5 non-native.

Woody vine families

Species representing 7woody vine families were found at Tall Pines in this survey.

Ferns & Allies

iNaturalist fern & ally Species Assigned Research Grade

<u>Botanical Name</u>	<u>Common Name</u>	<u>C-value/non-native</u>	<u>Family</u>
Asplenium platyneuron	ebony spleenwort	4	Aspleniaceae
Dennstaedtia punctilobula	hay-scented fern	4	Dennstaedtiaceae
Equisetum arvense	field horsetail	2	Equisetaceae
Onoclea sensibilis	sensitive fern	3	Onocleaceae
Osmundastrum cinnamomeum	cinnamon fern	5	Osmundaceae

iNaturalist fern & ally Species Below Research Grade

Botanical Name	Common Name	C-value/non-native	Family
Dryopteris sp.	wood fern	5	Dryopteridaceae

Total number fern & ally species 6, all native.

Fern & ally families

Species representing 6 fern & ally families were found at Tall Pines in this survey.

Grasses, Sedges & Rushes

iNaturalist grass, sedge & rush Species Assigned Research Grade

Botanical Name	Common Name	C-value/non-native	Family
Agrostis gigantea	redtop	non-native	Poaceae
Andropogon virginicus	broomsedge bluestem	2	Poaceae
Anthoxanthum odoratum	sweet vernal grass	non-native	Poaceae
Carex crinita	fringed sedge	5	Cyperaceae
Carex lurida	sallow sedge	4	Cyperaceae
Cyperus brevifoloides	Asiatic greenhead sedge	non-native	Cyperaceae
Cyperus brevifolius	shortleaf spikesedge	non-native	Cyperaceae
Cyperus iria	rice flat-sedge	non-native	Cyperaceae
Dichanthelium clandestinum	deertongue	2	Poaceae
Digitaria cognata	fall witchgrass	3	Poaceae
Digitaria sanguinalis	hairy crabgrass	non-native	Poaceae
Echinochloa crus-galli	barnyardgrass	non-native	Poaceae
Eleocharis obtusa	blunt spikerush	4	Cyperaceae
Eragrostis curvula	African love grass	non-native	Poaceae
Eragrostis spectabilis	purple lovegrass	2	Poaceae
Juncus effusus	soft rush	2	Juncaceae
Juncus tenuis	slender path rush	1	Juncaceae
Microstegium vimineum	Japanese stiltgrass	non-native	Poaceae
Miscanthus sinensis	Chinese silver grass	non-native	Poaceae
Panicum virgatum	switchgrass	2	Poaceae
Phalaris arundinacea	reed canary grass	1	Poaceae
Phragmites australis	common reed	non-native	Poaceae
Poa annua	Annual Meadow-grass	non-native	Poaceae
Poa bulbosa	Bulbous Meadow-grass	non-native	Poaceae
Poa pratensis	Kentucky bluegrass	non-native	Poaceae
Schoenoplectus tabernaemontani	soft-stemmed bulrush	5	Cyperaceae

Scirpus cyperinus	woolgrass	3	Cyperaceae
Setaria faberi	giant foxtail	non-native	Poaceae
Setaria pumila	yellow foxtail	non-native	Poaceae
Tridens flavus	purpletop tridens	1	Poaceae

iNaturalist grass, sedge & rush Species Below Research Grade

Botanical Name	Common Name	C-value/non-native	Family
Avenella flexuosa	wavy hair-grass	4	Poaceae
Carax sp.			Cyperaceae
Carex blanda	eastern woodland sedge	5	Cyperaceae
Carex vulpinoidea	fox sedge	3	Cyperaceae
Cyperus esculentus	yellow nutsedge	1	Cyperaceae
Digitaria ischaemum	smooth crabgrass	non-native	Poaceae
Paspalum sp.			Poaceae

Total number of grass, sedge & rush species 37.

17 native and 20 non-native.

Grass, sedge & rush families

Species representing 3 grass, sedge & rush families were found at Tall Pines in this survey.

Mosses

iNaturalist moss Species Assigned Research Grade

Botanical Name	Common Name	C-value/non-native	Family
Bryum argenteum	silvery bryum	1	Bryaceae
Ceratodon purpureus	redshank	1	Ditrichaceae
Frullania eboracensis	New York scalewort (liverwort)	native- no reference	Frullaniaceae
Polytrichum juniperinum	juniper haircap moss	4	Polytrichaceae
Thuidium delicatulum	delicate fern moss	3	Thuidiaceae

iNaturalist moss Species Below Research Grade

Botanical Name	Common Name	C-value/non-native	Family
Atrichum angustatum	lesser smoothcap	2	Polytrichaceae

Dicranum scoparium	broom moss	3	Dicranaceae
Entodon seductrix	seductive entodon moss	2	Entodontaceae
Leucobryum albidum	white moss	3	Leucobryaceae
Leucobryum glaucum	pincushion moss	3	Leucobryaceae
Mnium hornum	horn calcareous moss	6	Mniaceae
Neckera pennata	shingle moss	8	Neckeraceae
Orthotrichum stellatum	starry bristle moss	4	Orthotrichaceae
Plagiomnium sp.			Mniaceae
Pleurozium schreberi	red-stemmed Feather Moss	6	Hylocomiaceae
Polytrichum sp.			Polytrichaceae

Total number of moss species 16, all native

Moss families

Species representing 12 moss families were found at Tall Pines in this survey.

Plant Species Statistics

Number of native plant species: 215

Percentage of native plant species: 59%

Number of non-native plant species: 147

Percentage of non-native plant species: 41%

Total number of plant species: 362

Total number of plant families represented 109.

Plant families with the largest species representation at Tall Pines

Asteraceae (sunflower family): 44 species, 17 non-native.

Poaceae (grass family) 23 species, 14 non-native.

Fabaceae (pea/bean family) 22 species, 16 non-native.

Rosaceae (rose family) 17 species, 9 non-native.

Polygonaceae (knotweed family) 14 species, 7 non-native.

Brassicaceae (mustard family) 11 species, 8 non-native.

Fagaceae (beech family, including oaks) 11 species, 0 non-native.

Cyperaceae (sedge family) 11 species, 3 non-native.

Native mean C value for the site: 3.6

This is calculated by dividing the cumulative C values for all native species documented on the site by the number of native species. (747 site cumulative C values divided by 208=3.6). Note: 7 native plant observations were only to genus level and were not included in the calculation.

Total mean C value for the site: 2.1

This is calculated by dividing the cumulative C values for all native species documented on the site by the total number of species, native & non-native. (747 site cumulative C values divided by 353=2.1). Note: 9 plant observations were only to genus level and were not included in the calculation.

The Coefficients of Conservatism at Tall Pines

Commonly referred to as the C value, it is a number from 1 to 10 that is assigned to native plants. Non-native plants have a C value of 0. The higher the C value number, the more a given species is limited to or has an affinity for a habitat with very specific conditions and which is seen as more natural, pristine and unspoiled. Plant species with a lower C value are more tolerant of diverse habitats and of habitat disturbance. Thus the native mean and total mean C values for a site can quantify the quality or unspoiled naturalness of that site. The native mean for Tall Pines of 3.6 indicates a fair number of generalist and disturbance tolerant species, balanced by a number of higher C value species in the forested areas. The most significant indication of site quality at Tall Pines is the substantial difference between the native mean C value and the total mean C value, which includes the substantial number of non-native species (41% of the total species). This shows very clearly the negative impact of non-natives and invasives on habitat quality at Tall Pines, particularly in the upland areas.

Fungi including Lichens

iNaturalist Fungi Species Assigned Research Grade

Scientific Name	Common Name	Family
<i>Amanita muscaria guessowii</i>	American yellow fly agaric	Amanitaceae
<i>Cerrena unicolor</i>	mossy maze polypore	Cerrenaceae
<i>Cladonia cristatella</i>	British soldier lichen	Cladoniaceae
<i>Cladonia peziziformis</i>	turban cup lichen	Cladoniaceae
<i>Cladonia subcariosa</i>	peg lichen	Cladoniaceae
<i>Cladonia subtenuis</i>	dixie reindeer lichen	Cladoniaceae
<i>Biscogniauxia atropunctata</i>	hypoxylon canker	Graphostromataceae
<i>Gymnosporangium juniperi-virginianae</i>	juniper-apple rust	Gymnosporangiaceae
<i>Irpex lacteus</i>	milk-white toothed polypore	Irpicaceae
<i>Phaeolus schweinitzii</i>	dyer's polypore	Laetiporaceae
<i>Phlebia incarnata</i>	coral-pink merulius	Meruliaceae

Mycosphaerella colorata	mountain laurel leaf spot	Mycosphaerellaceae
Parmotrema hypotropum	powdered ruffle lichen	Parmeliaceae
Punctelia caseana	moondust speckled lichen	Parmeliaceae
Punctelia rudecta	rough speckled shield lichen	Parmeliaceae
Phaeophyscia rubropulchra	orange-cored shadow lichen	Physciaceae
Physcia millegrana	rosette lichen	Physciaceae
Trametes betulina	gilled polypore	Polyporaceae
Lophodermium pinastri	pine needle split	Rhytismataceae
Schizophyllum commune	splitgill mushroom	Schizophyllaceae
Kretzschmaria deusta	brittle cinder	Xylariaceae

Number of Research Grade fungi species: 21.

Fungi Families

Research Grade species representing 15 fungi families were found at Tall Pines in this survey.

<u>iNaturalist Fungi Species Below Research Grade</u>		
<u>Scientific Name</u>	<u>Common Name</u>	<u>Family</u>
Agaricus campestris	meadow mushroom	Agaricaceae
Chlorophyllum sp.		Agaricaceae
Amanita farinosa	American floury amanita	Amanitaceae
Amanita flavoconia	yellow patches	Amanitaceae
Vaginatae (section)	Amanita sect. Vaginatae	Amanitaceae
Exidia recisa	amber jelly fungus	Auriculariaceae
Boletaceae (family)	boletes	Boletaceae
Phylloporus sp.		Boletaceae
Xerocomus sp.		Boletaceae
Botryobasidium sp.		Botryobasidiaceae
Candelaria sp.	candleflame lichens	Candelariaceae
Candelariella efflorescens	powdery goldspeck	Candelariaceae
Cantharellus cinnabarinus	red chanterelle	Cantharellaceae
Irpiciporus pachyodon	marshmallow polypore	Cerrenaceae
Cladonia sp.	pixie cup lichens	Cladoniaceae
Cladonia chlorophaea	Cladonia chlorophaea aggregate	Cladoniaceae
Cladonia rei	wand lichen	Cladoniaceae
Cortinarius sp.	webcaps	Cortinariaceae
Diatrype sp.		Diatrypaceae
Diplocarpon rosae	black spot	Drepanopezizaceae
Entomophthora muscae	fly death fungi	Entomophthoraceae

Gloeophyllum sp.		Gloeophyllaceae
Grifola frondosa	hen of the woods	Grifolaceae
Helvella dryophila	oak-loving elfin saddle	Helvellaceae
Laccaria sp.	laccarias	Hydnangiaceae
	brown-toothed crust	
Hydnoporia olivacea	fungus	Hymenochaetaceae
Porodaedalea pini	pine bracket	Hymenochaetaceae
Trichaptum abietinum	purplepore bracket	Hymenochaetaceae
Kuehneromyces		
mutabilis	sheathed woodtuft	Hymenogastraceae
Tyromyces chioneus	white cheese polypore	Incrustoporiaceae
Calvatia sp.	puffbal	Lycoperdaceae
Lycoperdon marginatum	peeling puffball	Lycoperdaceae
Lycoperdon perlatum	common puffball	Lycoperdaceae
Marasmius capillaris		Marasmiaceae
Climacodon		
septentrionalis	northern tooth	Meruliaceae
Phlebia radiata	wrinkled crust	Meruliaceae
Mycena capillaripes	pinkedge bonnet	Mycenaceae
Nectria cinnabarina	coral spot	Nectriaceae
Usnea sp.	beard lichens	Parmeliaceae
Bjerkandera adusta	Smoky polypore	Phanerochaetaceae
Phlyctis argena	whitewash lichen	Phlyctidaceae
Phragmidium violaceum	rubus rust	Phragmidiaceae
Trabutia sp.		Phyllachoraceae
Armillaria gallica	bulbous honey fungus	Physalacriaceae
Physcia stellaris	star rosette lichen	Physciaceae
Pluteus chrysophlebius	yellow deer mushroom	Pluteaceae
Volvariella sp.	rosegills	Pluteaceae
Podoscypha petalodes	wine glass fungus	Podoscyphaceae
Daedaleopsis sp.		Polyporaceae
Ganoderma sp.	artist's brackets,	Polyporaceae
Ganoderma megaloma		Polyporaceae
Lentinus tigrinus	tiger sawgill	Polyporaceae
Trametes conchifer	little nest polypore	Polyporaceae
Trametes elegans	white maze polypore	Polyporaceae
Trametes hirsuta	hairy bracket	Polyporaceae
Trametes lactinea		Polyporaceae
Trametes ochracea	ochre bracket	Polyporaceae
Trametes versicolor	turkey-tail	Polyporaceae
Coprinellus		
disseminatus	trooping crumble cap	Psathyrellaceae
Coprinopsis		
atramentaria	common ink cap	Psathyrellaceae
Parasola auricoma	goldenhaired inkcap	Psathyrellaceae

Puccini sp.	orange-yellow rusts	Pucciniaceae
Russula ochroleuca	ochre brittlegill	Russulaceae
Russula rosacea	blood red russula	Russulaceae
Stereum complicatum	crowded parchment	Stereaceae
Stereum ochraceoflavum		Stereaceae
Stereum ostrea	false turkey-tail	Stereaceae
Stereum versicolor		Stereaceae
Xylobolus sp.		Stereaceae
Xylobolus frustulatus	ceramic parchment	Stereaceae
Lepraria sp.	dust lichens	Stereocaulaceae
Suillus americanus	chicken fat mushroom	Suillaceae
Tremella mesenterica	witch's butter	Tremellaceae
Apiosporina morbosa	black knot	Venturiaceae

Number of below Research Grade fungi species: 74.

Fungi Families

32 additional fungi families were represented by observations of below Research Grade species.

Insects

Butterflies (Order Lepidoptera, Superfamily Papilionodea)

iNaturalist Butterfly Species Assigned Research Grade

<u>Scientific Name</u>	<u>Common Name</u>	<u>Family</u>
Ancyloxypha numitor	least skipper	Hesperiidae
Atalopedes campestris	sachem	Hesperiidae
Burnsius communis	common checkered-skipper	Hesperiidae
Callophrys gryneus	juniper hairstreak	Lycaenidae
Calycopis cecrops	red-banded hairstreak	Lycaenidae
Celastrina neglecta	summer azure	Lycaenidae
Cercyonis pegala	common wood-nymph	Nymphalidae
Colias eurytheme	orange sulphur	Pieridae
Colias philodice	clouded sulphur	Pieridae
Cupido comyntas	eastern tailed-blue	Lycaenidae
Danaus plexippus	monarch	Nymphalidae
Epargyreus clarus	silver-spotted skipper	Hesperiidae
Erynnis horatius	horace's duskywing	Hesperiidae
Erynnis juvenalis	juvenal's duskywing	Hesperiidae

Euphyes vestris	dun skipper	Hesperiidae
Hylephila phyleus	fiery skipper	Hesperiidae
Junonia coenia	common buckeye	Nymphalidae
Lethe appalachia	Appalachian brown	Nymphalidae
Libytheana carinenta	American snout	Nymphalidae
Limenitis archippus	viceroy	Nymphalidae
Limenitis arthemis	red-spotted admiral	Nymphalidae
Limenitis arthemis astyanax	red-spotted purple	Nymphalidae
Lon zabulon	zabulon skipper	Hesperiidae
Lycaena phlaeas	American copper	Lycaenidae
Megisto cymela	little wood satyr	Nymphalidae
Nastra lherminier	swarthy skipper	Hesperiidae
Nymphalis antiopa	mourning cloak	Nymphalidae
Panoquina ocola	ocola skipper	Hesperiidae
Papilio polyxenes	black swallowtail	Papilionidae
Papilio troilus	spicebush swallowtail	Papilionidae
Phoebis sennae	cloudless sulphur	Pieridae
Phyciodes tharos	pearl crescent	Nymphalidae
Pieris rapae	cabbage white	Pieridae
Poanes viator	broad-winged skipper	Hesperiidae
Polites peckius	peck's skipper	Hesperiidae
Polygonia comma	eastern comma	Nymphalidae
Polygonia interrogationis	question mark	Nymphalidae
Pompeius verna	little glassywing	Hesperiidae
Satyrium calanus	banded hairstreak	Lycaenidae
Satyrium titus	coral hairstreak	Lycaenidae
Strymon melinus	gray hairstreak	Lycaenidae
Urbanus proteus	long-tailed skipper	Hesperiidae
Vanessa virginiensis	american lady	Nymphalidae
Wallengrenia egeremet	northern broken-dash	Hesperiidae

Number of Research Grade butterfly species: 44.

Butterfly Families

Research Grade species representing 5 butterfly families were found at Tall Pines in this survey.

iNaturalist Butterfly Species Below Research Grade

<u>Scientific Name</u>	<u>Common Name</u>	<u>Family</u>
Polites origenes	crossline skipper	Hesperiidae
Polites Themistocles	tawny-edged skipper	Hesperiidae

Number of Below Research Grade butterfly species: 2.

Butterfly Families

No additional families are represented by below Research Grade species.

Moths (Order Lepidoptera)

iNaturalist Moth Species Assigned Research Grade

<u>Scientific Name</u>	<u>Common Name</u>	<u>Family</u>
Acronicta americana	American dagger	Noctuidae
Antheraea polyphemus	polyphemus moth	Saturniidae
Apantesis arge	arge moth	Erebidae
Atteva aurea	ailanthus webworm moth	Attevidae
Callosamia promethea	promethea silkmoth	Saturniidae
Campaea perlata	pale beauty	Geometridae
Cenopis reticulatana	reticulated fruitworm moth	Tortricidae
Cycnia tenera	delicate cycnia moth	Erebidae
Endothenia hebesana	verbena bud moth	Tortricidae
Euchaetes egle	milkweed tussock moth	Erebidae
Haematopis grataria	chickweed geometer moth	Geometridae
Haploa clymene	clymene moth	Erebidae
Hemaris diffinis	snowberry clearwing	Sphingidae
Hyalophora cecropia	cecropia moth	Saturniidae
Hypercompe scribonia	giant leopard moth	Erebidae
Lomographa vestaliata	white spring moth	Geometridae
Marimatha nigrofimbria	black-bordered lemon moth	Noctuidae
Nomophila nearctica	lucerne moth	Crambidae
Palthis angulalis	dark-spotted palthis moth	Erebidae
Pyrrharctia isabella	isabella tiger moth	Erebidae
Renia adspergillus	speckled renia moth	Erebidae
Spoladea recurvalis	Hawaiian beet webworm moth	Crambidae
Thyridopteryx ephemeraeformis	evergreen bagworm moth	Psychidae

Number of Research Grade moth species: 23.

Moth Families

Research Grade species representing 9 moth families were found at Tall Pines in this survey.

iNaturalist Moth Species Below Research Grade

<u>Scientific Name</u>	<u>Common Name</u>	<u>Family</u>
Achyra sp.		Crambidae
Aethes sp.		Tortricidae

<i>Ancylis burgessiana</i>	oak leaffolder moth	Tortricidae
<i>Cabera pusaria</i>	common white wave	Geometridae
<i>Caenurgina erechtea</i>	forage looper moth	Erebidae
<i>Chytolita morbidalis</i>	morbid owlet	Erebidae
<i>Cisseps fulvicollis</i>	yellow-collared scape moth	Erebidae
<i>Desmia</i> sp.		Crambidae
<i>Diastictis ventralis</i>	white-spotted brown	Crambidae
<i>Eupithecia</i> sp.	pug moths	Geometridae
<i>Eusarca confusaria</i>	confused eusarca moth	Geometridae
<i>Heliothis phloxiphaga</i>	darker-spotted straw moth	Noctuidae
<i>Homoeosoma electella</i>	American sunflower moth	Pyrilidae
<i>Macaria aemulataria</i>	common angle	Geometridae
<i>Olethreutes fasciata</i>	banded olethreutes moth	Tortricidae
<i>Operophtera brumata</i>	winter moth	Geometridae
<i>Phragmatobia</i> sp.		Erebidae
<i>Ponomotia</i> sp.		Noctuidae
<i>Psamatodes abydata</i>	dot-lined angle	Geometridae
<i>Saucrobotys futilalis</i>	dogbane saucrobotys moth	Crambidae
<i>Sitochroa palealis</i>	carrot seed moth	Crambidae
<i>Spodoptera litura</i>	Oriental leafworm moth	Noctuidae
<i>Spodoptera ornithogalli</i>	yellow-striped armyworm moth	Noctuidae
<i>Udea rubigalis</i>	celery leaf-tier moth	Crambidae
<i>Virbia aurantiaca</i>	orange virbia moth	Erebidae

Number of below Research Grade moth species: 25.

Moth Families

1 additional moth family was represented by observations below Research Grade.

Dragonflies & Damselflies (Order Odonata)

iNaturalist Odonata Species Assigned Research Grade

<u>Scientific Name</u>	<u>Common Name</u>	<u>Family</u>
<i>Erythemis simplicicollis</i>	Eastern Pondhawk	Libellulidae
<i>Libellula incesta</i>	Slaty Skimmer	Libellulidae
<i>Libellula luctuosa</i>	Widow Skimmer	Libellulidae
<i>Libellula semifasciata</i>	Painted Skimmer	Libellulidae
<i>Libellula vibrans</i>	Great Blue Skimmer	Libellulidae
<i>Pachydiplax longipennis</i>	Blue Dasher	Libellulidae
<i>Perithemis tenera</i>	Eastern Amberwing	Libellulidae

Plathemis lydia	Common Whitetail	Libellulidae
Phanogomphus exilis	Lancet Clubtail	Gomphidae
Argia apicalis	Blue-fronted Dancer	Coenagrionidae
Argia tibialis	Blue-tipped Dancer	Coenagrionidae
Enallagma exulans	Stream Bluet	Coenagrionidae
Ischnura posita	Fragile Forktail	Coenagrionidae
Ischnura verticalis	Eastern Forktail	Coenagrionidae
Calopteryx maculata	Ebony Jewelwing	Calopterygidae

Number of Research Grade Odonata species: 15.

Research Grade Odonata Families

Research Grade species representing 4 Odonata families were found at Tall Pines in this survey

iNaturalist Odonata Species Below Research Grade

<u>Scientific Name</u>	<u>Common Name</u>	<u>Family</u>
Libellula cyanea	Spangled Skimmer	Libellulidae
Enallagma sp.	Bluets	Coenagrionidae
Phanogomphus sp.		Gomphidae

Number of Below Research Grade Odonata species:3.

Research Grade Odonata Families

No additional families were represented by Below Research Grade species.

Beetles (Order Coleoptera)

iNaturalist Beetle Species Assigned Research Grade

<u>Scientific Name</u>	<u>Common Name</u>	<u>Family</u>
Atalantycha bilineata	two-lined leatherwing	Cantharidae
Blepharida rhois	sumac flea beetle	Chrysomelidae
Calopteron terminale	end band net-winged beetle	Lycidae
Chauliognathus marginatus	marginated leatherwing beetle	Cantharidae
Chauliognathus pensylvanicus	goldenrod soldier beetle	Cantharidae
Chrysochus auratus	dogbane leaf beetle	Chrysomelidae
Cicindela punctulata	punctured tiger beetle	Carabidae
Cicindela repanda	bronzed tiger beetle	Carabidae
Cicindela sexguttata	six-spotted tiger beetle	Carabidae
Cicindela tranquebarica	oblique-lined tiger beetle	Carabidae
Coccinella septempunctata	seven-spotted lady beetle	Coccinellidae

Conoderus lividus		Elateridae
Cotinis nitida	common green June beetle	Scarabaeidae
Diabrotica undecimpunctata	spotted cucumber beetle	Chrysomelidae
Ellychnia corrugata	winter firefly	Lampyridae
Euphoria herbarum	olive flower beetle	Scarabaeidae
Euphoria inda	bumble flower beetle	Scarabaeidae
Exomala orientalis	Oriental beetle	Scarabaeidae
Harmonia axyridis	Asian lady beetle	Coccinellidae
Megacyllene robiniae	locust borer	Cerambycidae
Meloe sp.	oil beetles	Meloidae
Microrhopala xerone		Chrysomelidae
Necrophila americana	American carrion beetle	Silphidae
Notiophilus novemstriatus		Carabidae
Odontotaenius disjunctus	horned passalus beetle	Passalidae
Oiceoptoma inaequale	ridged carrion beetle	Silphidae
Oiceoptoma noveboracense	marginated carrion beetle	Silphidae
Popillia japonica	Japanese beetle	Scarabaeidae
Propylea quatuordecimpunctata	fourteen-spotted lady beetle	Coccinellidae
Pseudaedophrys hilleri	peach root weevil	Curculionidae
Sumitrosis inaequalis		Chrysomelidae
Tetraopes tetrophthalmus	red milkweed beetle	Cerambycidae
Typocerus velutinus	banded longhorn beetle	Cerambycidae

Number of Research Grade beetle species: 33.

Beetle Families

Research Grade species representing 13 beetle families were found at Tall Pines in this survey.

iNaturalist Beetle Species Below Research Grade

<u>Scientific Name</u>	<u>Common Name</u>	<u>Family</u>
Agrilus planipennis	emerald ash borer	Buprestidae
Amara sp.	sun beetles	Carabidae
Anomoea laticlavia	clay-colored leaf beetle	Chrysomelidae
Baridinae (superfamily)	flower weevils	Curculionidae
Bruchus sp.		Chrysomelidae
Cantharini (tribe)	soldier beetle	Cantharidae
Carpophilus sp.		Nitidulidae
Chrysomelidae (family)	leaf beetles	Chrysomelidae
Coccinellini (tribe)	black-spotted lady beetles	Coccinellidae
Cycloneda sp.	spotless lady beetles	Coccinellidae
Fulcidacini (tribe)	warty leaf beetles	Chrysomelidae

Lucidota atra	black firefly	Lampyridae
Meloe americanus	buttercup oil beetle	Meloidae
Melolonthinae (subfamily)	june beetles	Scarabaeidae
Neochlamisus sp.		Chrysomelidae
Olibrus sp.		Phalacridae
Peltodytes duodecimpunctatus		Haliplidae
Photinus pyralis	common eastern firefly	Lampyridae
Podabrus sp.	Soldier beetle	Cantharidae
Porrostoma sp.		Lycidae
Ptinidae (family)	deathwatch, spider, and wood-borer beetles	Ptinidae
Stenolophus sp.	seedcorn beetles	Carabidae
Strangalia acuminata		Cerambycidae
Tenebrio sp.	yellow mealworms	Tenebrionidae
Tenebrionoidea (superfamily)	darkling beetles and allies	
Trichiotinus affinis	hairy flower scarab	Scarabaeidae

Number of below Research Grade beetle species: 26.

Beetle Families

6 additional beetle families are represented in the observations below Research Grade.

Bees, Wasps & Ants (Order Hymenoptera)

iNaturalist Hymenoptera Species Assigned Research Grade

<u>Scientific Name</u>	<u>Common Name</u>	<u>Family</u>
Amphibolips confluenta	spongy oak apple gall wasp	Cynipidae
Ancistrocerus adiabatus	bramble mason wasp	Vespidae
Andrena erigeniae	spring beauty miner	Andrenidae
Andricus quercusflocci		Cynipidae
Apis mellifera	Western honey bee	Apidae
Augochlora pura	pure green-sweat bee	Halictidae
Bicyrtes quadrfasciatus	four-banded stink bug wasp	Crabronidae
Bombus impatiens	common eastern bumble bee	Apidae
Callirhytis quercuspunctata	gouty oak gall wasp	Cynipidae
Camponotus castaneus	chestnut carpenter ant	Formicidae
Camponotus chromaiodes	ferruginous carpenter ant	Formicidae
Chlorion aerarium	steel-blue cricket-hunter wasp	Sphecidae
Colletes inaequalis	unequal cellophane bee	Colletidae
Dasymutilla occidentalis	common eastern velvet ant	Mutillidae
Dielis plumipes	feather-legged scoliid wasp	Scoliidae

Disholcaspis quercusglobulus	round bullet gall wasp	Cynipidae
Dolichovespula	aerial yellowjackets	Vespidae
Dolichovespula maculata	bald-faced hornet	Vespidae
Eremnophila aureonotata	gold-marked thread-waisted wasp	Sphecidae
Eumenes fraternus	fraternal potter wasp	Vespidae
Megachile xylocopoides	carpenter-mimic leafcutter bee	Megachilidae
Monobia quadridens	four-toothed mason wasp	Vespidae
Polistes exclamans	Guinea paper wasp	Vespidae
Polistes fuscatus	dark paper wasp	Vespidae
Polistes metricus	metric paper wasp	Vespidae
Prenolepis imparis	small honey ant	Formicidae
Scolia bicincta	double-banded scoliid wasp	Scoliidae
Scolia dubia	blue-winged scoliid wasp	Scoliidae
Scolia dubia dubia	two-spotted scoliid wasp	Scoliidae
Scolia nobilitata	noble scoliid wasp	Scoliidae
Sphex nudus	katydid wasp	Sphecidae
Tapinoma sessile	odorous house ant	Formicidae
Theronia hilaris		Ichneumonidae
Trogus pennator		Ichneumonidae
Vespa crabro	european hornet	Vespidae
Vespula maculifrons	eastern yellowjacket	Vespidae
Vespula squamosa	southern yellowjacket	Vespidae
Xylocopa virginica	eastern carpenter bee	Apidae
Xylocopa virginica virginica		Apidae
Zapatella quercusmedullae		Cynipidae

Number of Research Grade Hymenoptera species: 40.

Hymenoptera Families

Research Grade species representing 13 Hymenoptera families were found at Tall Pines in this survey.

iNaturalist Hymenoptera Species Below Research Grade

<u>Scientific Name</u>	<u>Common Name</u>	<u>Family</u>
Agapostemon sp.	striped sweat bees	Halictidae
Agathidinae (subfamily)		Braconidae
Ammophila procera	common thread-waisted wasp	Sphecidae
Ancistrocerus antilope	lobed mason wasp	Vespidae
Andrena sp.		Andrenidae
Anthophila (family)	bees	
Augochlorella aurata	golden sweat bee	Halictidae
Augochlorini (tribe)	augochlorine sweat bees	Halictidae
Augochloropsis metallica	metallic epauletted-sweat bee	Halictidae

Campopleginae (subfamily)		Ichneumonidae
Ceratina sp.	small carpenter bees	Apidae
Cerceris sp.	typical weevil wasps and allies	Crabronidae
Chelostomoides sp. (subgenus)		Megachilidae
Crematogaster sp. (subgenus)	acrobat ants	Formicidae
Cynipini (tribe)	oak gall wasps	Cynipidae
Dialictus sp. (subgenus)	metallic sweat bees	Halictidae
Diastrophus sp.		Cynipidae
Dolerus sp.		Tenthredinidae
Ectemnius maculosus		Crabronidae
Eremnophila sp.		Sphecidae
Eriocampa ovata	alder sawfly	Tenthredinidae
Eriocampa sp.		Tenthredinidae
Euodynerus sp.		Vespidae
Formica fusca	fusca-group field ants	Formicidae
Formica pallidefulva	pallidefulva-group field ants	Formicidae
Formicinae (subfamily)	formicine ants	Formicidae
Halictinae (subfamily)	sweat and furrow bees	Halictidae
Halictini (tribe)		Halictidae
Halictus sp.	furrow bees	Halictidae
Hylaeus sp.	masked bees	Colletidae
Ichneumon sp.		Ichneumonidae
Ichneumonidae (family)	ichneumonid wasps	Ichneumonidae
Lasioglossum sp.		Halictidae
Lasius claviger	smaller yellow ant	Formicidae
Liris sp.		Crabronidae
Mesostenina (subtribe)		Ichneumonidae
Myzinum sp.	new world banded thynnid wasps	Thynnidae
Nomada sp.	nomad bees	Apidae
Onycholyda amplecta		Pamphiliidae
Osmia sp.	mason bees	Megachilidae
Perdita sp.	fairy bees	Andrenidae
Pimpla sp.		Ichneumonidae
Polistes rubiginosus	coarse-backed red paper wasp	Vespidae
Pyrobombus sp. (subgenus)		Apidae
Sceliphron caementarium	yellow-legged mud-dauber wasp	Sphecidae
Sericopompilus sp.		Pompilidae
Sphecodes sp.	blood bees	Halictidae

Number of below Research Grade Hymenoptera species: 47.

Hymenoptera Families

5 additional Hymenoptera families are represented in the observations below Research Grade.

Flies (Order Diptera)

iNaturalist fly Species Assigned Research Grade

<u>Scientific Name</u>	<u>Common Name</u>	<u>Family</u>
Bittacomorpha clavipes	Eastern phantom crane fly	Ptychopteridae
Bombylius major	greater bee fly	Bombyliidae
Bombylius pygmaeus	pygmy bee fly	Bombyliidae
Caryomyia tuberosolium		Cecidomyiidae
Chrysopilus thoracicus	golden-backed snipe fly	Rhagionidae
Cordyligaster septentrionalis		Tachinidae
Eristalis arbustorum	European drone fly	Syrphidae
Eristalis dimidiata	black-shouldered drone fly	Syrphidae
Eristalis tenax	common drone fly	Syrphidae
Eristalis transversa	transverse-banded flower fly	Syrphidae
Eurosta solidaginis	goldenrod gall fly	Tephritidae
Helophilus fasciatus	narrow-headed marsh fly	Syrphidae
Laphria flavicollis		Asilidae
Melanostoma mellinum	variable duskyface fly	Syrphidae
Milesia virginiana	Virginia giant	Syrphidae
Mydas clavatus	clubbed mydas fly	Mydidae
Nephrotoma ferruginea	ferruginous tiger crane fly	Tipulidae
Ocyrtamus fuscipennis	dusky-winged hover fly	Syrphidae
Orthonevra nitida	wavy mucksucker	Syrphidae
Phormia regina	black blow fly	Calliphoridae
Pollenia	cluster flies	Polleniidae
Pterallastes thoracicus	orangeback	Syrphidae
Rhagio mystaceus	common snipe fly	Rhagionidae
Toxomerus geminatus	Eastern calligrapher	Syrphidae
Toxomerus marginatus	marginated calligrapher	Syrphidae
Xenox tigrinus	tiger bee fly	Bombyliidae

Number of Research Grade fly species: 26.

Fly Families

Research Grade species representing 11 fly families were found at Tall Pines in this survey.

iNaturalist Fly Species Below Research Grade

<u>Scientific Name</u>	<u>Common Name</u>	<u>Family</u>
Aedes sp.		Culicidae
Anthomyiidae (family)	root-maggot flies	Anthomyiidae
Archytas sp.		Tachinidae
Bacchini (tribe)		Syrphidae
Bibionidae (family)	march flies	Bibionidae
Bibionomorpha (infraorder)	gnats and allies	
Calliphoridae (family)	blow flies	Calliphoridae
Calycomyza flavinotum		Agromyzidae
Chironomidae (family)	non-biting midges	Chironomidae
Chironomus sp.		Chironomidae
Coenosia sp.	tiger flies	Muscidae
Condyllostylus sp.		Dolichopodidae
Culicinae (subfamily)	culicine mosquitoes	Culicidae
Cylindromyia sp.		Tachinidae
Diamesa sp.	winter midges	Chironomidae
Diogmites neoternatus		Asilidae
Dolichopodidae (family)	long-legged flies	Dolichopodidae
Drosophilidae (family)	vinegar and fruit flies	Drosophilidae
Ephydriidae (family)	shore flies	Ephydriidae
Gonia sagax		Tachinidae
Gonia sp.		Tachinidae
Gymnosomatini (tribe)		Tachinidae
Hybomitra sp.		Tabanidae
Hydrophorinae (subfamily)		Dolichopodidae
Linnaemya sp.		Tachinidae
Lucilia sp.	greenbottle flies	Calliphoridae
Muscina sp.		Muscidae
Muscoidea (superfamily)	muscoid flies	
Neomochtherus sp.		Asilidae
Neomyia sp.		Muscidae
Ochthera sp.		Ephydriidae
Oestroidea (superfamily)	bot flies, blow flies, and allies	
Platycheirus sp.	sedgesitters	Syrphidae
Poecilanthrax sp.		Bombyliidae
Sarcophaga sp.	common flesh flies	Sarcophagidae
Sciapodinae (subfamily)		Dolichopodidae
Sepsis sp.		Sepsidae
Simuliidae (family)	black flies	Simuliidae
Syrphus rectus	yellow-legged flower fly	Syrphidae
Tachinidae (family)	bristle flies	Tachinidae

Temnostoma sp.	falsehorn flies	Syrphidae
Tipula oleracea	marsh crane fly	Tipulidae
Tipula paludosa	European crane fly	Tipulidae
Tipulinae (subfamily)		Tipulidae
Trichocera sp.		Trichoceridae
Trichopoda pennipes	swift feather-legged fly	Tachinidae
Triplicitipula sp. (subgenus)		Tipulidae

Number of below Research Grade fly species: 47.

Fly Families

12 additional fly families are represented in the observations below Research Grade.

True Bugs (Order Hemiptera)

iNaturalist true bug Species Assigned Research Grade

<u>Scientific Name</u>	<u>Common Name</u>	<u>Family</u>
Acanthocephala terminalis		Coreidae
Aphis nerii	oleander aphid	Aphididae
Apiomerus crassipes	bee assassin	Reduviidae
Aquarius conformis		Gerridae
Aquarius remigis	common water strider	Gerridae
Chinavia hilaris	green stink bug	Pentatomidae
Clastoptera xanthocephala	sunflower spittlebug	Clastopteridae
Colopha ulmicola	elm cockscomb aphid	Aphididae
Corixini (tribe)		Corixidae
Euthochtha galeator	helmeted squash bug	Coreidae
Gerrini (tribe)		Gerridae
Gerris sp.		Gerridae
Graphocephala versuta	versute sharpshooter	Cicadellidae
Halyomorpha halys	brown marmorated stink bug	Pentatomidae
Illinoia liriodendri	tuliptree aphid	Aphididae
Jikradia olitoria	coppery leafhopper	Cicadellidae
Leptoglossus oppositus		Coreidae
Lepyronia quadrangularis	diamondback spittlebug	Aphrophoridae
Lycorma delicatula	spotted lanternfly	Fulgoridae
Lygaeus kalmii angustomarginatus	eastern small milkweed bug	Lygaeidae
Megalotomus quinquespinosus	lupine bug	Alydidae
Metrobates hesperius		Gerridae
Neotibicen tibicen	swamp cicada	Cicadidae

Oncometopia orbona	broad-headed sharpshooter	Cicadellidae
Oncopeltus fasciatus	large milkweed bug	Lygaeidae
Paraulacizes irrorata	speckled sharpshooter	Cicadellidae
Phymata americana	jagged ambush bug	Reduviidae
Pselliopus barberi	orange assassin bug	Reduviidae
Rheumatobates		Gerridae
Trepobates subnitidus		Gerridae

Number of Research Grade true bug species: 30.

True Bug Families

Research Grade species representing 13 true bug families were found at Tall Pines in this survey.

iNaturalist True Bug Species Below Research Grade

<u>Scientific Name</u>	<u>Common Name</u>	<u>Family</u>
Acanalonia sp.		Acanaloniidae
Alydus pilosulus		Alydidae
Aphididae (family)	aphids	Aphididae
Banasa dimidiata	green burgundy stink bug	Pentatomidae
Chionaspis pinifoliae	pine needle scale	Diaspididae
Corimelaena sp.		Thyreocoridae
Cryptotympanina (subtribe)		Cicadidae
Deltocephalinae (subfamily)		Cicadellidae
Entylia carinata	keeled treehopper	Membracidae
Euschistus sp.		Pentatomidae
Gyponana sp. (subgenus)		Cicadellidae
Macrosiphum rosae	rose aphid	Aphididae
Melanoliarus sp.		Cixiidae
Miridae (family)	plant bugs	Miridae
Neotibicen sp.	dog-day cicadas	Cicadidae
Neurocolpus nubilus	clouded plant bug	Miridae
Pangaeus sp.		Cydnidae
Pentatomidae (family)	stink bugs	Pentatomidae
Pentatomoidea (superfamily)	stink bugs, shield bugs, and allies	
Periphyllus negundinis		Aphididae
Philaenus spumarius	meadow spittlebug	Aphrophoridae
Phylloxera caryaeavellana		Phylloxeridae
Podisus sp.		Pentatomidae

Number of below Research Grade true bug species: 23.

True Bug Families

7 additional true bug families are represented in the observations below Research Grade.

Grasshoppers, Locusts & Crickets (Order Orthoptera)

iNaturalist Orthoptera Species Assigned Research Grade

<u>Scientific Name</u>	<u>Common Name</u>	<u>Family</u>
Tetrix arenosa	obscure pygmy grasshopper	Tetrigidae
Neocurtilla hexadactyla	northern mole cricket	Gryllotalpidae
Chortophaga viridifasciata	green-striped grasshopper	Acrididae
Schistocerca americana	American bird grasshopper	Acrididae

Number of Research Grade Orthoptera species: 4.

Orthoptera Families

Research Grade species representing 3 Orthoptera families were found at Tall Pines in this survey.

iNaturalist Orthoptera Species Below Research Grade

<u>Scientific Name</u>	<u>Common Name</u>	<u>Family</u>
Acrididae (family)	short-horned grasshoppers	Acrididae
Allonemobius sp.	robust ground crickets	Trigonidiidae
Arphia sulphurea	sulphur-winged grasshopper	Acrididae
Chortophaga sp.		Acrididae
Conocephalus sp.	lesser meadow katydids	Tettigoniidae
Conocephalus strictus	straight-lanced meadow katydid	Tettigoniidae
Dissosteira		Acrididae
Dissosteira carolina	Carolina grasshopper	Acrididae
Gryllus pennsylvanicus	fall field cricket	Gryllidae
Gryllus veletis	spring field cricket	Gryllidae
Melanoplus sp.		Acrididae
Neoconocephalus sp.	common coneheads	Tettigoniidae
Oecanthus sp.	common tree crickets	Gryllidae
Oedipodinae (subfamily)	bandwing grasshoppers	Acrididae
Phaneropterinae (subfamily)	leaf katydids	Tettigoniidae
Spharagemon sp.		Acrididae

Tettigidea lateralis
Velarifictorus sp.

black-sided pygmy grasshopper

Tetrigidae
Gryllidae

Number of below Research Grade Orthoptera species: 18.

Orthoptera Families

3 additional Orthoptera families are represented in the observations below Research Grade.

Mantises (Order Mantodea)

iNaturalist mantis Species Assigned Research Grade

<u>Scientific Name</u>	<u>Common Name</u>	<u>Family</u>
Mantis religiosa	European mantis	Mantidae
Stagmomantis carolina	Carolina mantis	Mantidae
Tenodera sinensis	Chinese mantis	Mantidae

Number of Research Grade Mantis species: 3.

Number of below Research Grade Mantis species: 0.

Mantis Families

Research Grade mantis species representing 1 family were found at Tall Pines in this survey.

Additional Insect Orders

iNaturalist Species Assigned Research Grade

<u>Scientific Name</u>	<u>Common Name</u>	<u>Family</u>	<u>Order</u>
Chrysopa oculata	stink lacewing	Chrysopidae	Neuroptera

iNaturalist Species Below Research Grade

<u>Scientific Name</u>	<u>Common Name</u>	<u>Family</u>	<u>Order</u>
Taeniopterygidae (family)	winter stoneflies	Taeniopterygidae	Plecoptera
Myrmeleontidae (family)	antlions & owlflies	Myrmeleontidae	Neuroptera
Reticulitermes flavipes	eastern subterranean termites	Rhinotermitidae	Blattodea
Panorpa sp.	scorpionfly	Panorpidae	Mecoptera

Number of below Research Grade species: 4.

Orders & Families

3 additional orders and 4 additional families are represented in the observations below Research Grade.

Arachnids

Spiders (Order Araneae)

iNaturalist Spider Species Assigned Research Grade

<u>Scientific Name</u>	<u>Common Name</u>	<u>Family</u>
Allocosa funerea	wolf spider	Lycosidae
Mecynogea lemniscata	basilica orbweaver	Araneidae
Micrathena gracilis	spined micrathena	Araneidae
Rabidosa rabida	rabid wolf spider	Lycosidae
Dolomedes triton	six-spotted fishing spider	Pisauridae
Pisaurina mira	American nursery web spider	Pisauridae
Paraphidippus aurantius	golden jumping spider	Salticidae
Phidippus audax	bold jumping spider	Salticidae
Phidippus princeps	grayish jumping spider	Salticidae

Number of Research Grade Spider species: 14.

Spider Families

Research Grade species representing 7 spider families were found at Tall Pines in this survey.

iNaturalist Spider Species Below Research Grade

<u>Scientific Name</u>	<u>Common Name</u>	<u>Family</u>
Agelenopsis sp.	grass spiders	Agelenidae
Amaurobius sp.		Amaurobiidae
Araneinae (subfamily)	typical orbweavers	Araneidae
Araneoidea (superfamily)	araneoid spiders	
Clubiona sp.	Leafcurling sac spiders	Clubionidae
Dictynoidea (superfamily)	meshweavers and allies	
Frontinella sp.		Linyphiidae
Frontinella pyramitela	bowl-and-doily spider	Linyphiidae
Hahniidae (family)	hahniid spiders	Hahniidae
Hibana gracilis	garden ghost spider	Anyphaenidae
Linyphiidae (family)	sheetweb and dwarf weavers	Linyphiidae

Lycosidae (family)	wolf spiders	Lycosidae
Lycosoidea (superfamily)	wolf spiders and allies	
Metepeira labyrinthea	labyrinth orbweaver	Araneidae
Neriere radiata	filmy dome spider	Linyphiidae
Pardosa sp.	thin-legged wolf spiders	Lycosidae
Pachygnatha sp.	thick-jawed orbweavers	Tetragnathidae
Pelegrina sp.	white-cheeked jumping spiders	Salticidae
Rabidosa sp.		Lycosidae
Rabidosa rabida	rabid wolf spider	Lycosidae
Tetragnatha sp.		Tetragnathidae
Tetragnathidae (family)	long-jawed orbweavers	Tetragnathidae
Thomisidae (family)	crab spiders	Thomisidae
Tigrosa helluo	wetland giant wolf spider	Lycosidae
Xysticus	ground crab spiders	Thomisidae

Number of Below Research Grade spider species: 25.

Spider Families

10 additional spider families are represented in the observations below Research Grade.

Acariform Mites (Order Endeostigmata)

iNaturalist Arciform Mites Species Assigned Research Grade

<u>Scientific Name</u>	<u>Common Name</u>	<u>Family</u>
Aculops rhois	poison ivy leaf mite	Eriophyidae
Vasates quadripedes	maple bladder gall mite	Eriophyidae

Number of Research Grade Arciform Mite species: 2.

Arciform Mite Families

Research Grade species representing 1 arciform mite family was found at Tall Pines in this survey.

iNaturalist Arciform Mites Species Below Research Grade

<u>Scientific Name</u>	<u>Common Name</u>	<u>Family</u>
Eriophyes sp.		Eriophyidae
Eriophyes cerasicrumena	black cherry leaf gall mite	Eriophyidae

Number of Below Research Grade Arciform Mite species: 2.

Arciform Mite Families

No additional below Research Grade families were found at Tall Pines in this survey.

Ticks (Order Ixodida)

iNaturalist Tick Species Assigned Research Grade

<u>Scientific Name</u>	<u>Common Name</u>	<u>Family</u>
Amblyomma americanum	lone star tick	Ixodidae
Dermacentor variabilis	American dog tick	Ixodidae

Number of Research Grade Tick species: 2. No below Research Grade tick species were observed.

Tick Families

Research Grade species representing 1 tick family was found at Tall Pines in this survey.

Harvestmen (Order Opiliones)

No Harvestmen observations were assigned Research Grade.

iNaturalist Harvestmen species Below Research Grade

<u>Scientific Name</u>	<u>Common Name</u>	<u>Family</u>
Leiobunum vittatum	eastern harvestman	Sclerosomatidae
Opiliones (order)	harvestmen	
Phalangidae (family)	phalangiid harvestmen	Phalangidae

Number of Below Research Grade Harvestmen species: 3.

Harvestmen Families

2 harvestmen families are represented in the observations below Research Grade

Mites (Order Trombidiformes)

No Trombidiformes observations were assigned Research Grade.

iNaturalist Trombidiformes species Below Research Grade

<u>Scientific Name</u>	<u>Common Name</u>	<u>Family</u>
Tetranychidae (family)	spider mites	Tetranychidae
Trombidium sp.	mites	Trombidiidae

Number of Below Research Grade Trombidiformes species: 2.

Trombidiformes Families

2 Trombidiformes families are represented in the observations below Research Grade

Arachnid Totals

Number of Research Grade Arachnid species: 18.

Number of Orders: 3.

Arachnid Families

Research Grade species representing 9 Arachnid families were found at Tall Pines in this survey.

Number of Below Research Grade Arachnid species: 32.

Number of Additional Orders: 2.

Arachnid Families

Below Research Grade species representing 14 additional Arachnid families were found at Tall Pines in this survey.

Mollusks

Venerid Bivalves (Order Venerida)

iNaturalist Venerid Bivalve Species Assigned Research Grade

<u>Scientific Name</u>	<u>Common Name</u>	<u>Family</u>
Corbicula fluminea	Asian Clam	Cyrenidae

No below Research Grade Venerid Bivalve species were observed.

Stylommatophorid Land Snails & Slugs (Order Stylommatophora)

No Stylommatophora observations were assigned Research Grade

iNaturalist Stylommatophora Species Below Research Grade

<u>Scientific Name</u>	<u>Common Name</u>	<u>Family</u>
Deroceras laeve	meadow slug	Agriolimacidae
Helicoidea (superfamily)	helicoid land snails	
Limacoidea (superfamily)		
Neohelix sp.	whitelips	Polygyridae
Philomycus flexuolaris	winding mantleslug	Philomycidae
Polygyridae (family)	polygyrid snails	Polygyridae
Stylommatophora (order)	common land snails and slugs	
Triodopsis sp.	threeteeth	Polygyridae

Number of Below Research Grade Stylommatophora species: 8.

Trombidiformes Families

3 Stylommatophora families and 2 superfamilies are represented in the observations below Research Grade

Miscellaneous Invertebrates

Phylum Arthropoda (excluding insects & arachnids)

iNaturalist Arthropod Species Assigned Research Grade

<u>Scientific Name</u>	<u>Common Name</u>	<u>Class</u>	<u>Order</u>	<u>Family</u>
Apheloria virginensis	black-and-gold flat millipede	Diplopoda	Polydesmida	Xystodesmidae
Philoscia muscorum	common striped woodlouse	malacostraca	Isopoda	Philosciidae
Trachelipus rathkii	rathke's woodlouse	malacostraca	Isopoda	Trachelipodidae

Number of Research Grade Arthropod species: 3.

Arthropod Families

Research Grade species representing 3 arthropod families were found at Tall Pines in this survey.

iNaturalist Arthropod Species Below Research Grade

<u>Scientific Name</u>	<u>Common Name</u>	<u>Class</u>	<u>Order</u>	<u>Family</u>
Arthropoda	arthropods			
Crinocheta (no taxon)		Malacostraca	Isopoda	
Cylindroiulus sp.		Diplopoda	Julida	Julidae
Dicyrtomina sp.		Entognatha	Symphyleona	Dicyrtomidae
Eugnatha (subclass)		Diplopoda		
Hydroisotoma schaefferi		Entognatha	Entomobryomorpha	Isotomidae
Juliformia (superorder)	round-backed millipedes	Diplopoda		
Lithobius forficatus	brown centipede	Chilopoda	Lithobiomorpha	Lithobiidae
Oniscidea (superorder)	woodlice, pillbugs, and rock slaters	Malacostraca	Isopoda	

Number of Below Research Grade Arthropod species: 9.

Arthropod Families

Below Research Grade species representing 4 additional arthropod families were found at Tall Pines in this survey

Phylum Annelida (Segmented Worms)

No Annelida observations were assigned Research Grade.

iNaturalist Annelida Species Below Research Grade

<u>Scientific Name</u>	<u>Common Name</u>	<u>Class</u>	<u>Order</u>	<u>Family</u>
Lumbricidae (family)	earthworms	Clitellata	Haplotaxida	Lumbricidae

Lumbricus terrestris	common earthworm	Clitellata	Haplotaxida	Lumbricidae
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Number of Below Research Grade Annelida species: 2.

Allelida Families

Below Research Grade species representing 1 Annelida family were found at Tall Pines in this survey

Fish

Class Actinopterygii (Ray-fined Fishes)

iNaturalist Fish Species Assigned Research Grade

<u>Scientific Name</u>	<u>Common Name</u>	<u>Family</u>
Catostomus commersonii	white sucker	Catostomidae
Dorosoma cepedianum	American gizzard shad	Clupeidae
Fundulus heteroclitus	mummichog	Fundulidae
Lepomis gibbosus	pumpkinseed	Centrarchidae
Lepomis macrochirus	bluegill	Centrarchidae
Micropterus salmoides	largemouth bass	Centrarchidae

Number of Research Grade Fish species: 6.

Fish Families

Research Grade species representing 4 fish families were found at Tall Pines in this survey.

iNaturalist Fish Species Below Research Grade

<u>Scientific Name</u>	<u>Common Name</u>	<u>Family</u>
needs_id Gambusia sp.	mosquitofishes	Poeciliidae
needs_id Gambusia holbrooki	eastern mosquitofish	Poeciliidae

Number of Below Research Grade Fish species: 2.

Fish Families

Below Research Grade species representing 1 additional fish family were found at Tall Pines in this survey.

Amphibians

Order Anura (Frogs)

Note: The small number of frog species and the absence of salamander and related species make it likely the number of amphibian species at Tall Pines is underrepresented in this survey.

iNaturalist Frog Species Assigned Research Grade

<u>Scientific Name</u>	<u>Common Name</u>	<u>Family</u>
Hyla versicolor	Gray Treefrog	Hylidae
Lithobates clamitans	Green Frog	Ranidae
Lithobates palustris	Pickereel Frog	Ranidae

Number of Research Grade Frog species: 3.

Fish Families

Research Grade species representing 2 frog families were found at Tall Pines in this survey.

iNaturalist Frog Species Below Research Grade

<u>Scientific Name</u>	<u>Common Name</u>	<u>Family</u>
Lithobates sp.	American Water Frogs	Ranidae

Number of Below Research Grade Frog species: 1.

Frog Families

No additional families were noted in below Research Grade species.

Reptiles

Note: The very small number of snake species, small number of turtle species and the absence of lizard species make it likely the number of reptile species at Tall Pines is significantly underrepresented in this survey.

Order Squamata (Snakes & Lizards)

iNaturalist snake Species Assigned Research Grade

<u>Scientific Name</u>	<u>Common Name</u>	<u>Family</u>
Nerodia sipedon sipedon	Northern Watersnake	Colubridae
Pantherophis alleghaniensis	Eastern Ratsnake	Colubridae

Number of Research Grade snake species: 3.

SnakeFamilies

Research Grade species representing 1 snake family were found at Tall Pines in this survey.

There were no below Research Grade snake observations.

Order Testudines (Turtles)

iNaturalist turtle species Assigned Research Grade

<u>Scientific Name</u>	<u>Common Name</u>	<u>Family</u>
Chelydra serpentina	Common Snapping Turtle	Chelydridae
Chrysemys picta picta	Eastern Painted Turtle	Emydidae
Trachemys scripta	Common Slider	Emydidae
Trachemys scripta elegans	Red-eared Slider	Emydidae

Number of Research Grade turtle species: 4.

TurtleFamilies

Research Grade species representing 2 turtle families were found at Tall Pines in this survey.

iNaturalist turtle species Below Research Grade

<u>Scientific Name</u>	<u>Common Name</u>	<u>Family</u>
Deirochelyinae	Deirochelyine Turtles	Emydidae

Number of Research Grade turtle species: 4.

Turtle Families

Research Grade species representing 2 turtle families were found at Tall Pines in this survey.

Birds

(Class Aves)

iNaturalist bird Species Assigned Research Grade

<u>Scientific Name</u>	<u>Common Name</u>	<u>Family</u>
Accipiter cooperii	cooper's hawk	Accipitridae
Buteo jamaicensis	red-tailed hawk	Accipitridae
Buteo lineatus	red-shouldered hawk	Accipitridae
Buteo platypterus	broad-winged hawk	Accipitridae
Haliaeetus leucocephalus	bald eagle	Accipitridae
Megaceryle alcyon	belted kingfisher	Alcedinidae
Anas platyrhynchos	mallard	Anatidae
Anser caerulescens	snow goose	Anatidae
Branta canadensis	Canada goose	Anatidae
Ardea alba	great egret	Ardeidae
Ardea herodias	great blue heron	Ardeidae
Butorides virescens	green heron	Ardeidae
Bombycilla cedrorum	cedar waxwing	Bombycillidae
Cardinalis cardinalis	northern cardinal	Cardinalidae
Passerina caerulea	blue grosbeak	Cardinalidae
Passerina cyanea	indigo bunting	Cardinalidae
Piranga olivacea	scarlet tanager	Cardinalidae
Cathartes aura	turkey vulture	Cathartidae
Coragyps atratus	black vulture	Cathartidae
Certhia americana	brown creeper	Certhiidae
Zenaida macroura	mourning dove	Columbidae
Corvus brachyrhynchos	American crow	Corvidae
Cyanocitta cristata	blue jay	Corvidae
Coccyzus erythrophthalmus	black-billed cuckoo	Cuculidae
Haemorhous mexicanus	house finch	Fringillidae
Spinus tristis	American goldfinch	Fringillidae
Hirundo rustica	barn swallow	Hirundinidae
Stelgidopteryx serripennis	northern rough-winged	Hirundinidae

	swallow	
Tachycineta bicolor	tree swallow	Hirundinidae
Agelaius phoeniceus	red-winged blackbird	Icteridae
Icterus galbula	Baltimore oriole	Icteridae
Icterus spurius	orchard oriole	Icteridae
Molothrus ater	brown-headed cowbird	Icteridae
Quiscalus quiscula	common grackle	Icteridae
Icteria virens	yellow-breasted chat	Icteriidae
Dumetella carolinensis	gray catbird	Mimidae
Mimus polyglottos	northern mockingbird	Mimidae
Toxostoma rufum	brown thrasher	Mimidae
Baeolophus bicolor	tufted titmouse	Paridae
Poecile carolinensis	Carolina chickadee	Paridae
Cardellina pusilla	wilson's warbler	Parulidae
Geothlypis trichas	common yellowthroat	Parulidae
Leiothlypis peregrina	tennessee warbler	Parulidae
Mniotilta varia	black-and-white warbler	Parulidae
Parkesia noveboracensis	northern waterthrush	Parulidae
Seiurus aurocapilla	ovenbird	Parulidae
Setophaga americana	northern parula	Parulidae
Setophaga caerulescens	black-throated blue warbler	Parulidae
Setophaga coronata	yellow-rumped warbler	Parulidae
Setophaga discolor	prairie warbler	Parulidae
Setophaga fusca	blackburnian warbler	Parulidae
Setophaga magnolia	magnolia warbler	Parulidae
Setophaga palmarum	palm warbler	Parulidae
Setophaga pensylvanica	chestnut-sided warbler	Parulidae
Setophaga petechia	yellow warbler	Parulidae
Setophaga pinus	pine warbler	Parulidae
Setophaga ruticilla	American redstart	Parulidae
Setophaga striata	blackpoll warbler	Parulidae
Junco hyemalis	dark-eyed junco	Passerellidae
Melospiza georgiana	swamp sparrow	Passerellidae
Melospiza melodia	song sparrow	Passerellidae
Passerculus sandwichensis	savannah sparrow	Passerellidae
Passerella iliaca	fox sparrow	Passerellidae
Pipilo erythrophthalmus	eastern towhee	Passerellidae
Spizella passerina	chipping sparrow	Passerellidae
Spizella pusilla	field sparrow	Passerellidae
Zonotrichia albicollis	white-throated sparrow	Passerellidae
Passer domesticus	house sparrow	Passeridae
Phalacrocorax auritus	double-crested cormorant	Phalacrocoracidae
Meleagris gallopavo	wild turkey	Phasianidae

Colaptes auratus luteus	northern yellow-shafted flicker	Picidae
Dryobates pubescens	downy woodpecker	Picidae
Dryobates villosus	hairy woodpecker	Picidae
Dryocopus pileatus	pileated woodpecker	Picidae
Melanerpes carolinus	red-bellied woodpecker	Picidae
Sphyrapicus varius	yellow-bellied sapsucker	Picidae
Polioptila caerulea	blue-gray gnatcatcher	Polioptilidae
Regulus calendula	ruby-crowned kinglet	Regulidae
Regulus satrapa	golden-crowned kinglet	Regulidae
Scolopax minor	american woodcock	Scolopacidae
Sitta canadensis	red-breasted nuthatch	Sittidae
Sitta carolinensis	white-breasted nuthatch	Sittidae
Bubo virginianus	great horned owl	Strigidae
Archilochus colubris	ruby-throated hummingbird	Trochilidae
Thryothorus ludovicianus	carolina wren	Troglodytidae
Troglodytes aedon	house wren	Troglodytidae
Catharus guttatus	hermit thrush	Turdidae
Hylocichla mustelina	wood thrush	Turdidae
Sialia sialis	eastern bluebird	Turdidae
Turdus migratorius	american robin	Turdidae
Contopus virens	eastern wood-pewee	Tyrannidae
Myiarchus crinitus	great crested flycatcher	Tyrannidae
Sayornis phoebe	eastern phoebe	Tyrannidae
Tyrannus tyrannus	eastern kingbird	Tyrannidae
Vireo gilvus	warbling vireo	Vireonidae
Vireo griseus	white-eyed vireo	Vireonidae
Vireo olivaceus	red-eyed vireo	Vireonidae

Total number of Research Grade bird species: 97

Avian Families

Species representing 32 avian families were found at Tall Pines in this survey. Those with the largest species representation at the site were:

Parulidae (warblers) 17 species.

Passerellidae (sparrow and related species) 9 species.

Picidae (woodpeckers) 6 species.

Accipitridae (hawks & eagles) 5 species.

iNaturalist bird Species Below Research Grade

<u>Scientific Name</u>	<u>Common Name</u>	<u>Family</u>
Coccyzus americanus	yellow-billed cuckoo	Cuculidae
Empidonax sp.	Empidonax flycatchers	Tyrannidae
Larus sp.	large white-headed gulls	Laridae
Tringa flavipes	lesser yellowlegs	Scolopacidae

Number of Below Research Grade bird species: 4.

Bird Families

Below Research Grade species representing 1 additional bird family were found at Tall Pines in this survey.

Note: The actual number of bird species that occur at Tall Pines likely substantially exceeds the 98 species observed in the BYEC project. *eBird*, the community based online birding site managed by the Cornell Lab of Ornithology, lists 154 bird species sighted at Tall Pines as of 1/30/22 and reflects a much closer scrutiny made possible by the efforts of by many knowledgeable birders over a number of years. Considering the above BYEC list was compiled by a limited number of observers over a limited period of time, it presents a solid record of bird species likely to be seen at Tall Pines.

Mammals

(Class Mammalia)

iNaturalist mammal Species Assigned Research Grade

<u>Scientific Name</u>	<u>Common Name</u>	<u>Order</u>	<u>Family</u>
Scalopus aquaticus	eastern mole	Eulipotyphla	Talpidae
Blarina brevicauda	northern short-tailed shrew	Eulipotyphla	Soricidae
Castor canadensis	american beaver	Rodentia	Castoridae
Marmota monax	groundhog	Rodentia	Sciuridae
Odocoileus virginianus	white-tailed deer	Artiodactyla	Cervidae
Ondatra zibethicus	muskrat	Rodentia	Cricetidae
Peromyscus leucopus	white-footed mouse	Rodentia	Cricetidae
Procyon lotor	common raccoon	Carnivora	Procyonidae
Sciurus carolinensis	eastern gray squirrel	Rodentia	Sciuridae
Sylvilagus floridanus	eastern cottontail	Lagomorpha	Leporidae
Vulpes vulpes	red fox	Carnivora	Canidae

Number of Research Grade mammal species: 11.

Mammal Families & Orders

Research Grade species representing 9 mammal families and 5 mammal orders were found at Tall Pines in this survey.

iNaturalist mammal Species Below Research Grade

<u>Scientific Name</u>	<u>Common Name</u>	<u>Order</u>	<u>Family</u>
Talpidae (family)	moles and desmans	Eulipotyphla	Talpidae

Number of Below Research Grade mammal species: 1.

Mammal Families & Orders

No additional mammal families or orders were found in the below Research Grade species.