2021

Cover Mapping Guide

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Five Rivers MetroParks

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Cover mapping is a scientific process of mapping vegetation types. While it is an in-depth sampling method it is not an inventory. It collects information about the species size, species composition as well as impacts from deer and invasive species. By collecting this sample data Five Rivers MetroParks (FRMP) can determine the current health of our habitats, how the habitats have changed over time, and make management recommendations.

Tools & Materials

Clipboard & pens/pencils

Data recording sheets

Data code sheets

DBH tapes

Size class pipe (new for 2017)

Aerial maps

GPS with antenna and stylus

Compass

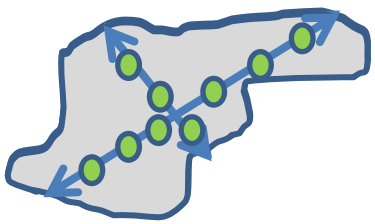
Field guides & binoculars (optional)

Methods

There are two different types of cover mapping data collection based on what type of habitat is being assessed. To determine which method to use first decide on the canopy stocking. How much of the canopy is closed? If it is A. (0-25%) you are probably in a grassland, a B. (26-50%) you may be in more of a thicket habitat, while C. (51-75%) or D. (76-100%) rating indicates a young or mature forest. Any unit with less than 50% canopy closure (A or B rating) should use the field data collection method, while over 50% canopy closure (C or D rating) should receive the forest data collection method.

Units

Regardless of the method, each unit should be mapped in a cross-section in order to collect the best overall data as in the figure below. Additional points may be taken if needed.



Travel to the starting point in the unit. Usually, a north-south and east-west cross-section of the unit is best. The first point will be just inside the unit line. Take a point on the GPS, (all units start with point number 1) numbering each point with a consecutive number for each unit. Collect the data for that point. Using the compass determines the heading direction to travel to the next point. Use the compass to walk 100 paces in as straight of a line as possible. This will be the next point. Continue this process to the unit edge.

Forest Data Collection

Looking up from a point determine up to 5 canopy trees that have branches directly above that point. These canopy trees must be alive and cannot be overtopped by another tree. It does not matter if the base of the tree is far away as long as part of the canopy is overhead. Record the species and diameter at breast height (DBH 4.5 feet from the ground). If the tree is on a hill the diameter should be taken from the uphill side. If there is a vine attached to the tree that you cannot go under including the vine in the diameter.

Next, determine up to 5 sub-canopy trees within ten feet of the GPS point. If there are more than five trees, select the five largest trees and record the species and DBH. Record the species and DBH. Sub-canopy trees are species that will eventually replace canopy trees. These are different than understory trees which are typically smaller at maturity. Refer to the code sheet for species lists of either canopy or understory species.

List (do not measure) any understory trees or shrubs within ten feet of the point. List any herbaceous species within ten feet.

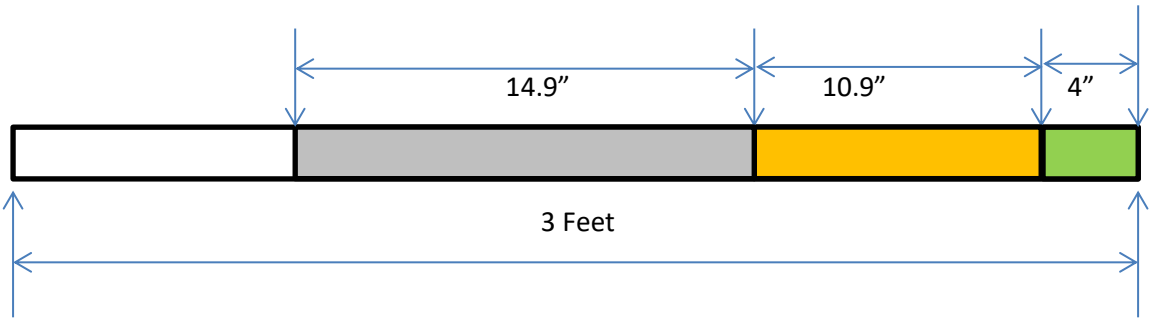
Field Data Collection

Field data (areas that have a stocking of less than 50%) collection differs somewhat from forest collection. These are areas that currently do not have a substantial canopy and therefore canopy data cannot be collected.

At each point record the species of the five largest canopy or potential canopy species within ten feet of the point. Instead of getting an exact measurement list of the size class that they would fall into.

Size Class
1 (seedling) < 3' tall
2 (sapling) > 3' tall
3 (pole) 4-10.9" DBH
4 (young) 11-14.9" DBH
5 (mature) > 15" DBH

A PVC pipe is a quick way of determining the size class without having to take a measurement (see figure below). The entire pipe is 3 feet long. Hold the pipe touching the ground next to the individual. If the woody individual is shorter than the pipe it is a seedling. If the individual is taller than the pipe, hold the pipe perpendicular to the tree and if it is less than the width of the green band it is a sapling. If the width falls within the orange band it is a pole size while if it falls within the grey band it is a young tree. Above that would be a mature tree.



Understory and sub-canopy information are not applicable at these sites. Data regarding the herbaceous layer is divided into cool season (CSG) or warm-season grasses (WSG). If grasses are not present, (NG) may be selected. Circle the one that best fits the area. This will help identify the area as a meadow or a prairie.

Planted prairies are composed of native warm-season grasses (those that grow in the summer and are dormant in the winter). The plants found in prairies often form dense clumps. Grass meadows are usually former pasture or hayfields that is allowed to progress without regular mowing. These areas are dominated by cool-season grasses (those that grow actively in spring and fall) from Europe and Asia. These grasses are shorter than those found in a prairie and have a more rhizomatous growth form.

Field and Forest Collection

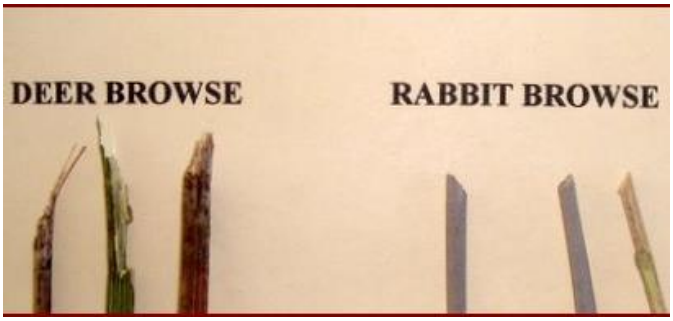
Both methods will collect data on woody invasives and deer impacts.

Past cover mapping methods collected the density of honeysuckle. Certain areas may be dominated by other invasive woody species such as autumn olive and the burning bush. To address this, data will be collected on the overall stocking of invasive woody species. If there are multiple species of invasives present, group them together to get the density but list the species separately. This will provide information for future management.

Woody Invasive Stocking
0 none present
A <10%
B 10-39%
C 40-69%
D 70%+

Other data to be collected at each point are the amount of deer impact and any special features. Look around the 10-foot sampling point for evidence of tracks, scat, rubbing, or browse from deer. Deer browse will look like the tops of plants have been ripped off, whereas rabbit browse will have a clean 45-degree cut.

Deer Impact
0 No deer signs
A Signs of deer (trails, scat, rub, bedding areas)
B Signs of deer browse
C Heavily browsed understory
D Browse line forming



Special features are specific observations made about the site. Note dead standing trees, rare plants, or if the site is on a steep slope, among others.

Data Crunching

As data is collected each unit then gets "crunched". This is a process that averages all the data together. Lots of scrap paper, the crunching data sheet, and a calculator are needed for this process.

1. Average the stocking and tree diameter for canopy and sub-canopy separately. This will determine the size class for the unit. In open field data, the most dominant size class will be used, and an average is not applicable.
2. Determine the 3 most dominant species for canopy and sub-canopy.
3. List the largest tree diameter and species.
4. List forest understory woody species, herbaceous plants, and special features.
5. Find the average deer impact and woody invasive stocking.
6. List woody invasive species.
7. Use the plant community and/or forest community lists to determine the cover type that best fits the unit.

Pay close attention to each data point when crunching. At times part of the unit may be very different from the rest of the unit. If this is the case unit lines need to be redrawn. They can be merged with neighboring units or split to make a different unit. Looking at the GIS maps showing the data points can be helpful in deciding this as well as making comments when in the field. For example, unit 5555 has 3 points. 2 of these points are characteristic of a beech-maple forest while the other point is dominated by red cedar. Look at nearby points in other units to see if they are also dominated by red cedar or if another unit needs to be created.

Plant Communities

Cover mapping recognizes 41 plant communities within the FRMP and each has a numeric code.

Developed-00

1. Mowed Turf (01) - Open areas maintained as turf. Often in high-use areas.
2. Row Crop (02) - Used to produce row crops such as corn.

Water-10

1. Water (12)- Ponds, lakes with no emerging vegetation
2. Rivers (13)- Moving water with no emerging vegetation
3. Mudflat (11) - Frequently flooded areas where open mud with little or no vegetation exists.
4. Sandbar (14) - Sand/gravel areas with little or no vegetation, usually found adjacent to a bend in a stream or river.

Wetlands-20

1. Emergent Wetland (21) - Wetland is usually fed by groundwater. Typically composed of sedges, rushes, and plants requiring frequent or constant moisture. Few or no woody plants are present.
2. Forested Wetland (22) - Open wetland containing cattails and other emerging vegetation. Can be fed by groundwater or surface runoff. Needs constant moisture and no severe flooding. Commonly on shallow areas of lakes and ponds.

Cultivated-30

1. Pasture (3011)- Used for grazing of livestock
2. Hayfield (3012)- Grassland periodically cut for hay

Prairies-31

Grassland is composed of warm-season plants native to the Dayton area. Typically planted by FRMP on former farmland. Usually maintained by periodic burning in early spring. Contains plant species now rarely found in the wild. Excellent habitat for grassland birds and mammals.

1. Planted Grass Prairie (312) - Former pasture or hayfield managed as grassland wildlife habitat. Dominated by native warm-season grasses.
2. Grass-Forb Prairie (313) - Same as grass meadow but dominated by a mixture of grasses and forbs (flowering plants).
3. Forb Prairie (314) - Same as a grass meadow but dominated by flowering plants such as goldenrod, aster, and teasel.

Meadows-32

1. Grass Meadow (322) - Former pasture or hayfield managed as grassland wildlife habitat. Managed by periodic mowing in early spring or late summer. Dominated by cool-season forage grasses from Europe or Asia.
2. Grass-Forb Meadow (323) - Same as grass meadow but dominated by a mixture of grasses and forbs (flowering plants).
3. Forb Meadow (324) - Same as a grass meadow but dominated by flowering plants such as goldenrod, aster, and teasel.

Remnant Prairie–33

1. A historic or original prairie site that has survived to some extent undisturbed by European settlement. Typically, areas that could not be plowed, and can include rare and/or plants of a local genotype.

Edge Thicket-40

1. Shrubs/Small Trees (41) - Dominated by shrubs and trees less than 30 feet at maturity.
2. Shrubs/Small trees/ Successional Hardwoods (42) - Similar to (41) but containing significant numbers of successional hardwoods. There are young trees that can eventually form a forest canopy such as White Ash and Black Cherry.
3. Successional Hardwoods (43) - Dominated by seedling or sapling size successional hardwood trees.
4. Eastern Red Cedar (4422) - Dominated by seedling and sapling size Eastern Red Cedar trees. A common plant community on former pasture land is usually where bedrock is close to the surface.
5. Eastern Red Cedar and Successional Hardwoods (4421) - A mix of seedling and sapling size trees but a mix of Eastern Red Cedar and other successional hardwoods.
6. Pine/Spruce (4436) - Dominated by planted Pine and/or Spruce of a seedling or sapling size.

Woodlands-50

1. Successional Hardwoods (51) - Dominated by pole to young-sized successional hardwood trees. Commonly White Ash, Black Cherry, Black Locust, and Hackberry. Very common cover type in MetroParks.
2. Oak-Hickory (521) - Oak and/or Hickory make up 50% or more of the canopy trees. Less than 20% of the canopy is composed of Sugar Maple. Typically, dry sites and/or south/west facing slopes.
3. Beech-Maple (522) - American Beech and/or Sugar Maple make up 50% or more of canopy trees with each being over 20% of the canopy. Typically, in moist ravines or north/east-facing slopes.
4. Elm/Ash/Maple (523) - Elm/Ash and Maple (Red or Silver) make up 50% or more of canopy trees. Typically, on uplands on very poorly drained soils.
5. Oak-Maple (524) - Oak at least 20% of the canopy. Sugar Maple at least 25% of the canopy. Beech and/or Tulip Tree less than 20% canopy. A plant community that is not as dry as Oak-Hickory.
6. Mixed Mesophytic (525) - No single genus dominates. Usually a diverse mix of Oaks, Hickories, Beech, Sugar Maple, Ash, Tulip Tree, and Basswood. Typical in moist ravines. Usually on fertile, well-drained, and moist sites.
7. Other (526) - A forest community that does not match any in this description. Often a site modified by logging or other disturbances, but sometimes a unique plant community.

Riparian Hardwoods-53

1. Cottonwood/Sycamore Riparian Hardwoods (531) - Greater than 50% canopy Cottonwood, Sycamore, or Box Elder. Silver Maple and Willow are common associates. Found in regularly flooded areas along streams.
2. Mixed Riparian Hardwoods (532) - Greater than 50% of the canopy are other hardwoods. Usually Black Walnut, Hackberry, Tulip Tree, Bitternut Hickory, Buckeye, Elm, and Bur Oak. Areas are occasionally flooded.

Mature Conifers- 56

1. Mature Pine/Spruce (5625) - These groves have been planted at various times starting in the 1930s.
2. Mature Eastern Red Cedar (5626) - Although Eastern Red Cedars usually do not exceed 20 feet in height, in some areas they have grown quite large either because of local conditions or the thinning of competing hardwoods.

Forest Size Classes

Forests are defined as land having a canopy of trees greater than or equal to 4 inches. The canopy must cover at least 50% of the ground. Forests dominate much of FRMP land and mature stands contain some of the region's best natural areas. These forests contain a rich diversity of trees, wildflowers, fungi, birds, and animals. Forests have been divided into 4 categories:

1.) Pole- Canopy trees are between 4 inches and 10.9 inches in diameter.

2.) Young- Canopy trees are between 11 inches and 14.9 inches in diameter.

3.) Mature- Canopy trees average greater than 15 inches in diameter.

4.) Old Growth-

The old-growth size class denotes a forest community that is very similar in composition to forests that were present when this area was settled in the early 1800s. While there are many definitions of "old-growth", the one FRMP has chosen is based more on forest structure and composition than on land-use history. Using these criteria, it is possible to call a forest stand old-growth even if it has had some selected timber harvest or light grazing long ago. To be called "old-growth", a MetroPark forest must:

Have an average trunk diameter of canopy trees 20" or greater in uplands

Have an average trunk diameter of canopy trees 24" or greater in floodplains.

Contain trees with a trunk diameter of 30" or greater in uplands.

Contain trees with trunk diameters of 36" or greater in floodplains.

Contain significant quantities of large fallen logs and standing dead snags.

Contain a diversity of herbaceous vegetation indicating a healthy soil/humus layer and little if any damage from grazing.

Deer Impact

Many park agencies in the Eastern and Midwestern United States are being confronted with the problem of too many White-tailed Deer. These animals were rare at the turn of the century but

have become common as forest land has returned and the animals have adapted to a rural/suburban environment.

Without natural predators such as wolves, or hunting by humans, they reproduce rapidly. When this happens, they can over browse meadows and woodlands. Many woodland species such as trilliums cannot tolerate browsing for more than a few years. If the problem gets severe, a browse line forms. This is a visible line in the woods where no herbaceous plants or leaves are present below 5 feet. When this happens the forest plant life may have been severely damaged. Deer damage was monitored in the cover-mapping process to establish baseline information and to allow MetroParks to assess the impact of deer.

Honeysuckle Infestation

Bush Honeysuckle (*Lonicera mackii*) is a shrub native to the Amur River valley of China. It was widely distributed in the Eastern United States by the U.S. Soil Conservation Service. Unfortunately, it has spread rapidly outside the planted areas and is now one of the most abundant plants in the Dayton area. It thrives in young woods, disturbed areas, and suburban yards. It produces dense shade and out competes native shrubs and trees. Over time other woody invasive shrubs have been introduced or escaped cultivation. MetroParks is evaluating its impact on the natural areas and hopes to determine how to control these invasives.

Five Rivers MetroParks - Cover Map Forest Data

Facility: ______________________________ Date Mapped: ______________________________

Unit: ______________________________ Mapped By: ______________________________

Map #

Point: __________

Canopy Trees	Sub-Canopy Trees
1)	1)
2)	2)
3)	3)
4)	4)
5)	5)

Understory Woody Species Present: ______________________________

Stocking	Woody Invasive	Deer
Invasive Woody sp.		

Special Features: ______________________________

Herbaceous Layer: ______________________________

Point: __________

Canopy Trees	Sub-Canopy Trees
1)	1)
2)	2)
3)	3)
4)	4)
5)	5)

Understory Woody Species Present: ______________________________

Stocking	Woody Invasive	Deer
Invasive Woody sp.		

Special Features: ______________________________

Herbaceous Layer: ______________________________

Point: __________

Canopy Trees	Sub-Canopy Trees
1)	1)
2)	2)
3)	3)
4)	4)
5)	5)

Understory Woody Species Present: ______________________________

Stocking	Woody Invasive	Deer
Invasive Woody sp.		

Special Features: ______________________________

Herbaceous Layer: ______________________________

Point: __________

Canopy Trees	Sub-Canopy Trees
1)	1)
2)	2)
3)	3)
4)	4)
5)	5)

Understory Woody Species Present: ______________________________

Stocking	Woody Invasive	Deer
Invasive Woody sp.		

Special Features: ______________________________

Herbaceous Layer: ______________________________

Five Rivers Metro Parks **Unit data**

Facility _____ Date Crunched _____

Reference Photo # _____ Crunched By _____

Date Scanned _____ Date Entered _____

		Canopy								Sub Canopy		Understory and Features							
reference photo #	unit	cover type	stocking	size class	3 dominant spp	Avg. Tree Diam.	Largest Tree Diam/spp	3 dominant spp	Avg. Tree Diam	Forest Understory Woody spp	Herbaceous Plants	Woody Invasive Stocking	Woody Invasive Number	Woody Invasive Species	Deer Impact	Deer Impact Number	Special Features	comments

Five Rivers MetroParks - Cover Map Field Data

Facility: ______________________	Date Mapped: ______________________
Unit: ______________________	Mapped By: ______________________
Map #	

Point: __________

Woody Species	Size Class
1)	1)
2)	2)
3)	3)
4)	4)
5)	5)

Stocking	Woody Invasive	Deer

Invasive Woody Sp.

Special Features: ______________________

____

Herbaceous Layer: WSG NG CSG

Circle one

Point: __________

Woody Species	Size Class
1)	1)
2)	2)
3)	3)
4)	4)
5)	5)

Stocking	Woody Invasive	Deer

Invasive Woody sp.

Special Features: ______________________

____

Herbaceous Layer: WSG NG CSG

Circle one

Point: __________

Woody Species	Size Class
1)	1)
2)	2)
3)	3)
4)	4)
5)	5)

Stocking	Woody Invasive	Deer

Invasive Woody sp.

Special Features: ______________________

____

Herbaceous Layer: WSG NG CSG

Circle one

Point: __________

Woody Species	Size Class
1)	1)
2)	2)
3)	3)
4)	4)
5)	5)

Stocking	Woody Invasive	Deer

Invasive Woody sp.

Special Features: ______________________

____

Herbaceous Layer: WSG NG CSG

Circle one

Five Rivers MetroParks - Cover Mapping Keys

Stocking Class

A 0-25%
B 26-50%
C 51-75%
D 76-100%

Woody Invasive Stocking

0 none present
A <10%
B 10-39%
C 40-69%
D 70%+

Deer Impact

0 no deer signs
A signs of deer (trails, scat, rub)
B Signs of deer browse
C Heavily browsed understory
D Browse line forming

Special Features

A - Plantation
B - Blowdown
C - Caves, cliffs, rock outcrops
D - Drained
E - Eroded
F - Flooded
G - High graded (logged)
H - Xeric (dry)
J - Fallen trees, logs
K - Mesic (moist)
L- Reforestation area
M- Mammal (specify if possible)
N - Steep slope
O - Rare plant
P - Pasture / grazed
Q - Stream
R - Fence
S - Siltation
T - Large standing dead trees
U - Trail
W - Hydric (wet)
X - Burned
Y - Cutover
Z - Pollution (Trash)

Canopy Trees

Catalpa - CA
Ailanthus(Tree of Heaven) - HV (i)
Ash, Blue - BA
Ash, Green - GA
Ash, White - WA
Basswood - BD
Beech - B
Box Elder - Box
Buckeye - BE
Callery Pear – CP(i)
Cedar, Red - RC
Cherry, Black - BC
Cottonwood - C
Elm, American - AE
Elm, Slippery - SE
Firs - Fir
Hackberry - HB
Hickory - H
Hickory, Bitternut - BH
Hickory, Pignut - PH
Hickory, Shagbark -SH
Kentucky Coffee Tree - KC
Locust, Black - BL
Locuts, Honey - HL
Maple, Red - RM
Maple, Silver -SILM
Maple, Sugar - SM
Oak, Chinquapin - CO
Oak, Black - BO
Oak, Burr - BR
Oak, Red - RO
Oak, White - WO
Osage Orange - OO
Pine, Austrian - AP
Pine, Red - RP
Pine, Scotch - SP
Pine, White - WP
Spruce, Norway - NS
Sycamore - S
Tuliptree (Yellow Poplar) - TT
Walnut, Black - BW
Willow - W

Shrubs/Understory Trees

American Bittersweet - AB
Autum Olive - AO (i)
Blackberry/Raspberry - BB
Bladdernut - BN
Dogwood, Flowering - FD
Dogwood, Shrubby - SD
Elderberry - EB
Euonymus, Burning Bush - BU (i)
Euonymus,Wahoo - WH
Euonymus,Winter Creeper - WT (i)
Gooseberry - GB
Grape Vine - GV
Green-Briar - GRB
Hawthorn - HN
Honeysuckle, Amur - AH (i)
Honeysuckle, Japanese - JH (i)
Ironwood (*Ostrya*) - IR
Leatherwood - LW
Moonseed - MO
Mulberry - MB
Musclewood (*Carpinus*) - MW
Oriental Bittersweet - OB (i)
Pawpaw - PP
Persimmon - PM
Poison Ivy - PI
Privet - PR (i)
Redbud - RB
Rose, Multiflora Rose - MR (i)
Rose, Wildrose - WR
Sassafrass - SF
Spicebush - SB
Sumac - SU
Viburnum - VB
Virginia Creeper - VC
Wild Crab - WC

Five Rivers MetroParks - Cover Mapping Keys

Herbaceous Layer, Grasses, and Forbs	
Agrimony - AG	Orchid - OC
Asiatic Dayflower - AD	Phlox - FL
Aster - As	Plantain - PL
Avens - AV	Pokeweed - PW
Bed Straw - BS	Queen Anne's Lace - Qa
Bergamot - Ber	Ragweed - Rd
Black Medic - BM	Rattlesnake Bush - RSB
Bloodroot - BLR	Rattlesnake Master - RSM
Bluegrass - BLG	Red Clover - Re
Bluestem, Big Bluestem - Bi	Reed Canary Grass - Rcg
Bluestem, Little Bluestem - Li	Rough Dropseed - Rs
Boneset - BOS	Sedge - Sg
Bottlebrush Grass - BG	Smooth Bed Straw - SBS
Brome - BRM	Snakeroot, Black - BSR
Broomsedge - BMS	Snakeroot, White - WSR
Canadian Wild Rye - Cwr	Solomon's Seal - SS
Chickweed - CW	Sorrel - SR
Chicory - CH	Starry Campion - STC
Dogbane - Db	Sweet Cicely - SC
Ferns - FE	Switchgrass - Sw
Fleabane - FB	Tall Bellflower - TB
Foxtail - Fo	Tall Fescue - TF
Gall of the Earth - GE	Teasel - Ts
Garlic Mustard - GM	Thimbleweed - TW
Goldenrod - Go	Timothy - Ti
Heal-all - HA	Trillium - TR
Hepatica - HP	Twinleaf - TL
Horsetails - HT	Vinca - VI
Indian Grass - In	Violets - VL
Ironweed - IW	Virginia Knotweed - VK
Jack in the Pulpit - JP	Virginia Rye - VR
Jewel Weed - JW	Wild Blue Lettuce - WBL
Lesser Celandine - LC	Wild Cucumber - WCC
May Apple - MA	Wild Ginger - GN
Mixed cool s.g. - CSG	Wild Grape - WG
Mixed Prairie Forbs - Pf	Wingstem - WGS
Mixed Warm Season g. - WSG	Wood Sorrel - WS
Nettle - N	Yarrow- Y
Orchard Grass - Or	Yellow Sorrel - YS

Key to Forest Communities of Five Rivers MetroParks

Forest(50)
--Crown closure>50%
--Canopy trees≥ 4.0" dbh avg.

Hardwood
--Broad-leaved trees≥ 50% of canopy

Upland hardwoods (52)
--Not subject to flooding from surface waters

Established

Oak/ Hickory (521)
--Oak and/or Hickory make up 50% or more of canopy trees
-- < 20% sugar maple

Beech/Maple (522)
--Beech and/or Sugar Maple make up 50% or more of canopy
--Beech> 20% of canopy
--Over 20% Sugar Maple

Elm/Ash/Maple Swamp (523)
--Elm, Ash, Soft Maple ≥ 50% of canopy

Oak/Maple (524)
--Oak at least 20% of canopy
--Sugar Maple at least 25% of canopy
--Beech and/or Yellow Poplar < 20% of canopy

Mixed (525)
--No single genus dominates canopy
--Usually includes combination of oaks, hickory, beech, maple, ash, tulip tree, basswood

Other (526)
--None of the above
(Describe)

Successional (51)
--Even aged
--First generation from old field
--Often Ash, Cherry, Locust
--Pole or young size class

Bottomland hardwoods (53)
--Subject to regular or periodic flooding from surface waters

Cottonwood/Sycamore/Box Elder (531)
-- ≥ 50% of canopy cottonwood, sycamore, Box Elder
--Silver Maple and willow common associates
--Regularly flooded

Mixed (532)
--Occasionally flooded
-- > 50% of canopy other hardwoods, usually walnut, hackberry, tulip tree, bitternut hickory, buckeye, elm, bur oak

Conifer (56)

E. Redcedar (5626)
-- ≥ 50% canopy E. Redcedar

Pine/Spruce (5625)
-- > 50% canopy pine or spruce

Five Rivers MetroParks

Cover Mapping Field Reference List

Cover Types

- Developed-00
  - Mowed Turf-01
  - Row Crops-02
- Water-10
  - Pond/Lake-12
  - River/Stream-13
  - Mudflat-11
  - Sandbar-14
- Wetlands-20
  - Emergent Wetland-21
  - Forested Wetland-22
- Cultivated-30
  - Pasture-3011
  - Hayfield-3012
- Prairies-31
  - Grass Prairie-312
  - Grass-Forb Prairie-313
  - Forb Prairie- 314
- Meadows-32
  - Grass Meadow-322
  - Grass-Forb Meadow-323
  - Forb Meadow-324

Remnant Prairie-33

Edge Thicket-40

- Shrubs/Small Trees-41
- Shrubs/Small Trees/Successional Hardwoods-42
- Successional Hardwoods-43

Conifers (seedling & sapling size)-44

- Eastern Red Cedar Edge/Thicket-442
  - E. Red Cedar and Successional Hardwoods-4421
  - Eastern Red Cedar-4422
  - Pine/Spruce-443
  - Pine/Spruce and Successional Hardwoods-4435
  - Pine/Spruce-4436

Woodlands (crown closure 50% 4”+ dbh)-50

- Successional Hardwoods (pole-young size)-51
- Upland Hardwoods-52
  - Oak-Hickory-521
  - Beech-Maple-522
  - Elm-Ash-Maple-523
  - Oak-Maple-524
  - Mixed Mesophytic-525
  - Other-526
- Riparian Hardwoods-53
  - Sycamore-Cottonwood-Box Elder-531
  - Mixed Riparian Hardwoods-532
- Mature Conifers-56
  - Pine/Spruce-5625
  - Eastern Red Cedar-5626