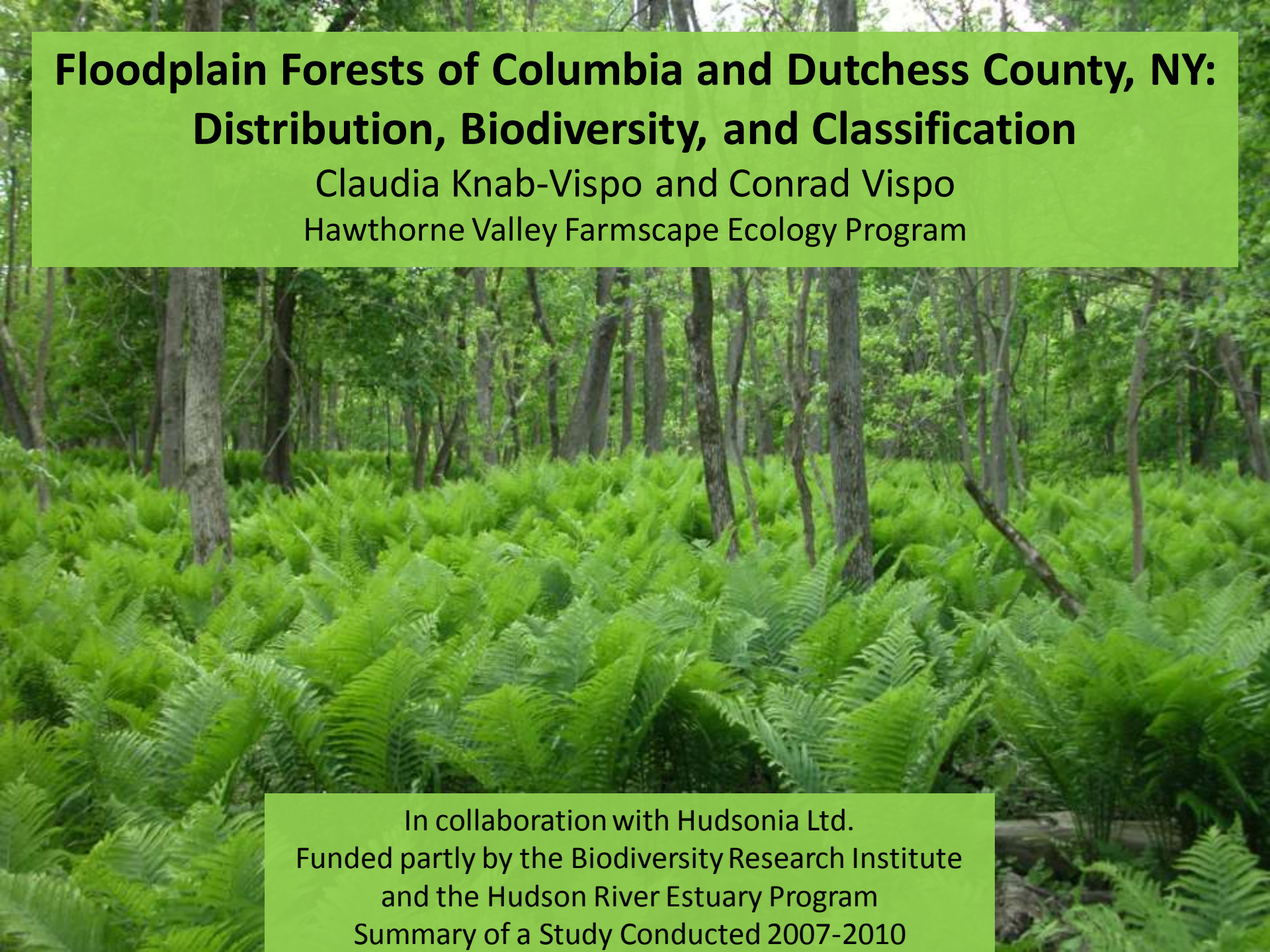


Floodplain Forests of Columbia and Dutchess County, NY: Distribution, Biodiversity, and Classification

Claudia Knab-Vispo and Conrad Vispo
Hawthorne Valley Farmscape Ecology Program

In collaboration with Hudsonia Ltd.
Funded partly by the Biodiversity Research Institute and the Hudson River Estuary Program
Summary of a Study Conducted 2007-2010

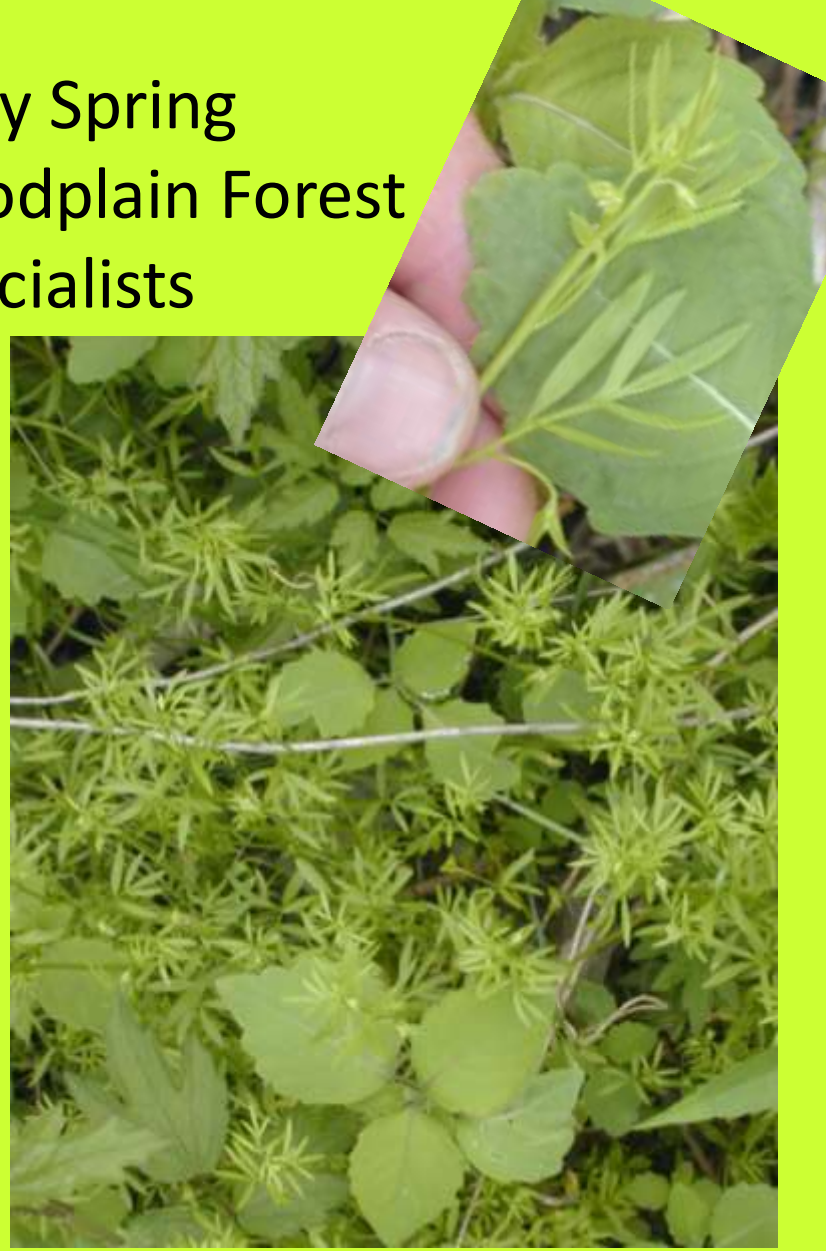
We studied: forests located on alluvial soil, which were subjected to occasional flooding by the stream alternating with long intervals of non-saturated soil.

We did not study: permanently flooded or saturated swamp forests or freshwater tidal swamps

Common Spring Flora of Floodplain Forests (but not exclusive to them)

Early Spring Floodplain Forest Specialists

Green Dragon (*Arisaema dracontium*)



False Mermaid Weed (*Floerkea proserpinacoides*)

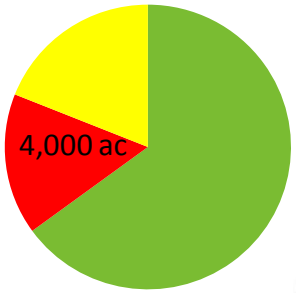
1930/40s 2004

Ancient

Recently Reforested

Distribution of Floodplain Forests in Columbia and Dutchess County, NY

Columbia County
(412,000acres; ~ 60,000 people;
6% floodplain = 24,700 ac)

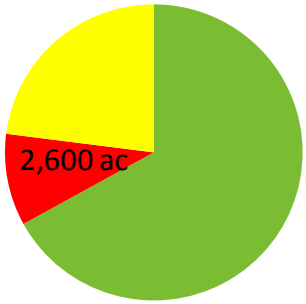


Unforested Alluvial Soil

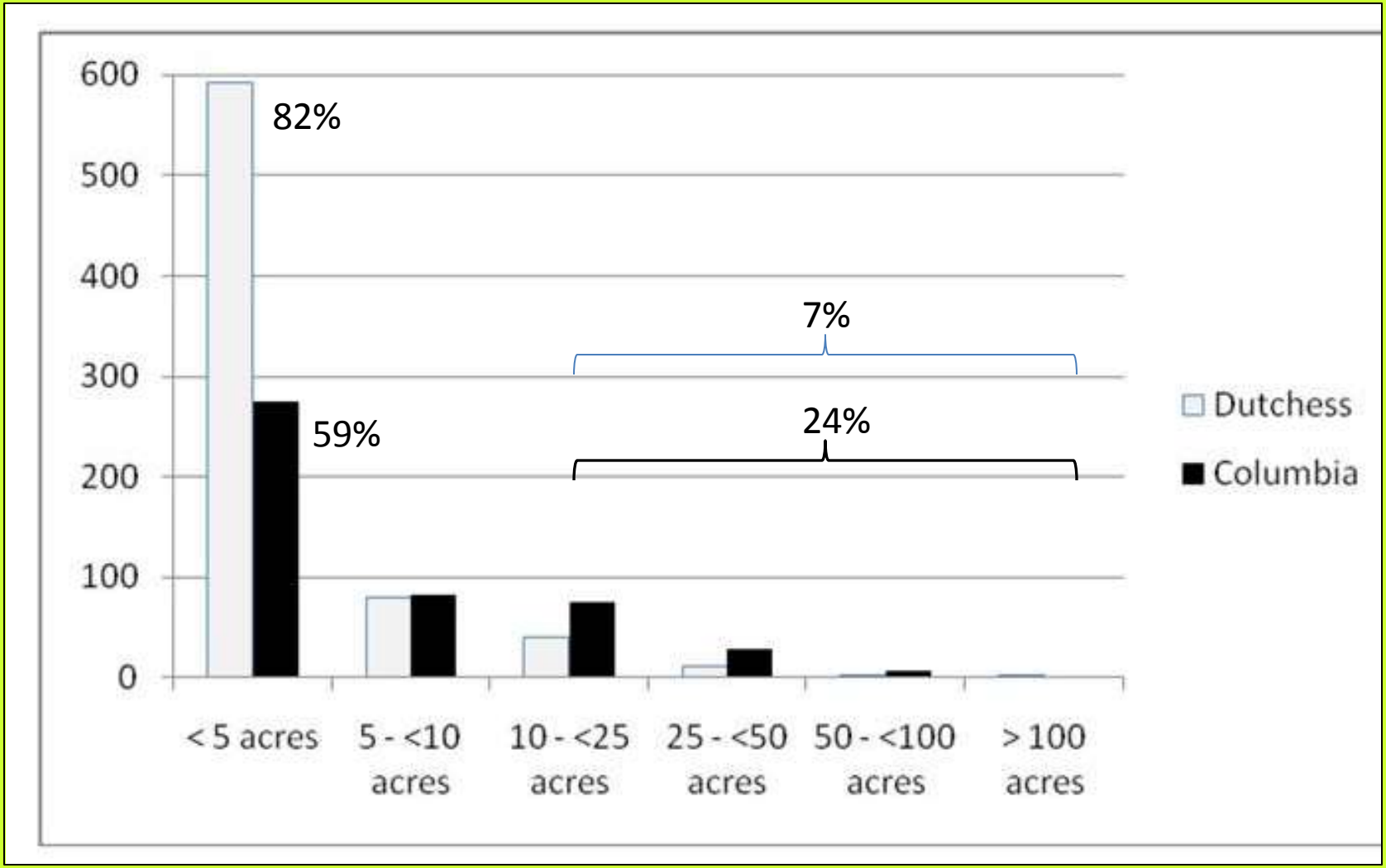
Recently Reforested Floodplain

Ancient Floodplain Forest

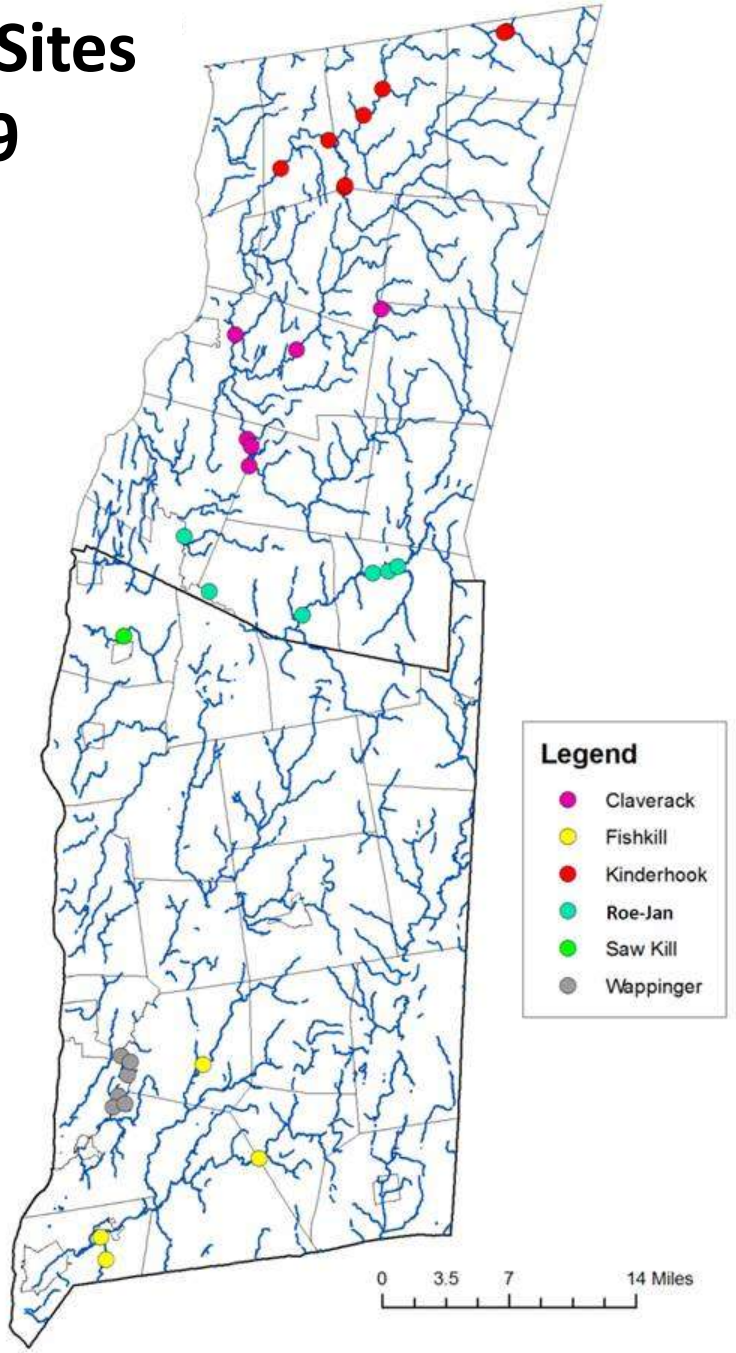
Dutchess County
(519,490acres; ~ 300,000 people;
5% floodplain = 26,000 ac)



Size Distribution of Remaining Ancient Floodplain Forest Patches in Dutchess and Columbia County

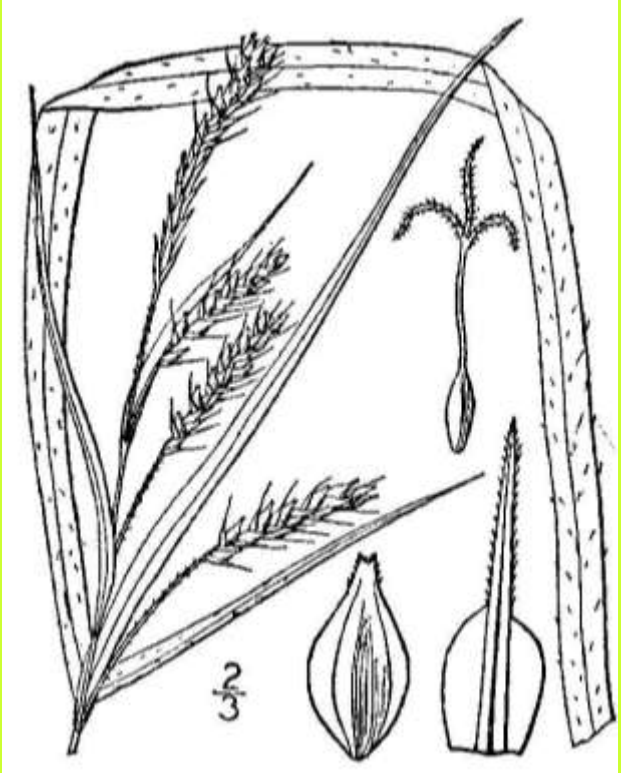


Study Sites 2008/9



VASCULAR PLANTS

442 species, incl.
1 NYS-threatened species (*Carex davisii*)
1 NYNHP Watchlist species (*Mimulus alatus*)
and 45 regionally rare or uncommon species



Carex davisii

(Image from USDA Plants/ Britton & Brown)

BUTTERFLIES

20 species of butterflies, including the rare Hackberry Emperor, American Snout (and Question Mark) and the uncommon Spicebush Swallowtail

Illinois River Cruiser

DRAGON- AND DAMSELFLIES

45 species,
10 of these were new county records, including

- Brook Snaketail
- Spine-Crowned Clubtail
- Arrow Clubtail
- and Blue-tipped Dancer

(all species of greatest conservation need)

Brook Snaketail

Arrow Clubtail

BEES

59 species of native bees (most of which were new county records)

Half of the bee species that visited floodplain forest flowers in the spring, were found to pollinate agricultural crops later in the season

GROUND BEETLES

85 species,
35 of which might be rare or uncommon in our region

HABITAT-SPECIFICITY of Floodplain Forest Dwellers


Green Dragon

- **50 species of plants** which, in our experience, occur almost exclusively or mostly along streams (at least in Dutchess and Columbia County)
- 23 (>**50%) of the dragon- and damselfly** species were classified as stream or river species, whose larvae develop in running water
- **half of the bee species** were not observed in farmland adjacent to the five floodplain forests sampled for bees
- **more than half of the ground beetle species** were classified as associated with water

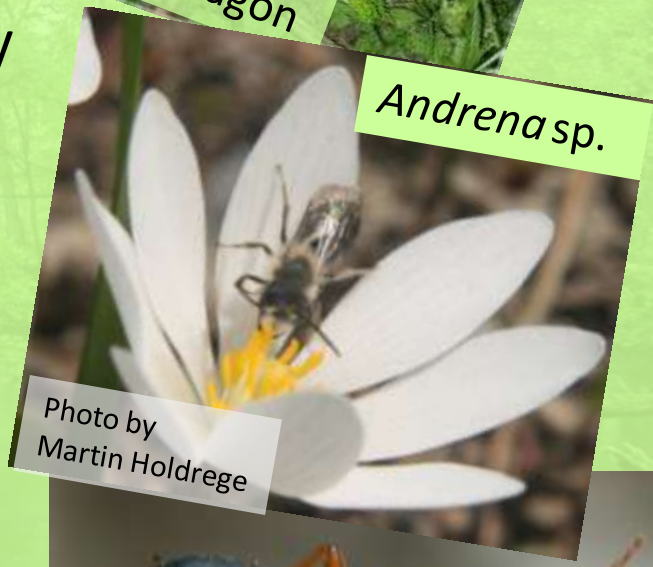

Andrena sp.

Photo by Martin Holdrege


Bombadier Beetle

INVASIVE PLANTS

35 species, most common were

Garlic Mustard (*Alliaria petiolata*)
Multiflora Rose (*Rosa multiflora*) } 100% of sites

Dame's Rocket (*Hesperis matronalis*)
Japanese Stiltgrass (*Microstegium vimineum*)
Reed Canary Grass (*Phalaris arundinacea*)
Moneywort (*Lysimachia nummularia*) } > 75% of sites

Japanese Barberry (*Berberis thunbergii*)
Non-native Honeysuckle (mostly *Lonicera* morrowii)
Oriental Bittersweet (*Celastrus orbiculatus*)
Black Locust (*Robinia pseudoacacia*)
Long-bristled Smartweed (*Polygonum caespitosum*)
Purple Loosestrife (*Lythrum salicaria*)
Ground Ivy (*Glechoma hederacea*) } > 50% of sites

	Floodplain Forest Type				
	Sugar Maple - dominated	Elm - Sugar M. - Bitternut	Elm - Ash - Black Cherry	Black Locust - Sycamore - Cottonwood	Green Ash - Silver Maple
	n=11	*n=10*	*n=23*	*n=8*	*n=19*
Sugar Maple	63**	27	4	3	0
Ironwood	32**	0	3	0	1
Bitternut	15	46**	17	0	8
Slippery Elm	0	59**	14	3	0
Basswood	8	39**	14	0	9
American Elm	8	25	40**	8	17
Black Cherry	1	4	45**	10	2
Ash	3	19	38**	1	9
Honeysuckle	0	0	31**	6	0
Grape	1	15	29*	1	9
Black Locust	0	0	0	81**	0
Sycamore	9	7	12	56**	1
Cottonwood	2	1	6	50**	2
Boxelder	0	0	7	49**	8
Toringo Crab	0	0	0	38**	0
Oriental Bittersweet	0	0	0	36**	0
Willow	0	0	0	38**	0
Green Ash	0	6	7	5	70**
Silver Maple	0	1	0	3	80**
Nannyberry	0	2	3	0	26**
Spicebush	4	0	1	0	25**
Swamp White Oak	0	0	1	0	15*

	Floodplain Forest Type				
	Sugar Maple - dominated	Elm - Sugar M. - Bitternut	Elm - Ash - Black Cherry	Black Locust - Sycamore - Cottonwood	Green Ash - Silver Maple
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Nannyberry	0	2	3	0	26**
Spicebush	4	0	1	0	25**
Swamp White Oak	0	0	1	0	15*


Sugar Maple – dominated Floodplain Forest

Sugar Maple – dominated Floodplain Forest

- High terrace
- Ancient forests
- Flooded ~ once/year by water of moderate speed, quickly drains right back into creek
- Dense canopy
- Diverse, but not dense flora of spring ephemerals, few shrubs and mid-summer herbs
- Herb indicator: White Wood Aster (*E. divaricata*)
- Dominant trees regenerating **=>** “Climax”?

	Floodplain Forest Type				
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Nannyberry	0	2	3	0	26**
Spicebush	4	0	1	0	25**
Swamp White Oak	0	0	1	0	15*


Elm – Sugar Maple – Bitternut Floodplain Forest

Elm – Sugar Maple – Bitternut Floodplain Forest

- High to lower terrace
- Ancient and recently reforested forests
- Flooded ~ once/year, quickly drained
- Rich and dense flora of spring ephemerals (Wild Leek, Blue Cohosh, Bloodroot, Wild Ginger, Violets, etc.), somewhat more and taller mid-summer herbs, more shrubs

=> Succession towards Sugar Maple – dominated Floodplain Forest?

	Floodplain Forest Type				
	Sugar Maple - dominated	Elm - Sugar M. - Bitternut	Elm - Ash - Black Cherry	Black Locust - Sycamore - Cottonwood	Green Ash - Silver Maple
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Green Ash	0	6	7	5	70**
Silver Maple	0	1	0	3	80**
Nannyberry	0	2	3	0	26**
Spicebush	4	0	1	0	25**
Swamp White Oak	0	0	1	0	15*

Elm – Ash – Black Cherry Floodplain Forest

Elm – Ash – Black Cherry Floodplain Forest

- High to lower terrace
- Mostly recently reforested forests
- Flooded ~ once/year, quickly drained
- Diverse, but not dense flora of spring ephemerals, tall and dense mid-summer herbs
- Invasive shrubs can be dense

=> ???

	Floodplain Forest Type				
	Sugar Maple - dominated	Elm - Sugar M. - Bitternut	Elm - Ash - Black Cherry	Black Locust - Sycamore - Cottonwood	Green Ash - Silver Maple
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Green Ash	0	6	7	5	70**
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Nannyberry	0	2	3	0	26**
Spicebush	4	0	1	0	25**
Swamp White Oak	0	0	1	0	15*


Black Locust – Sycamore – Cottonwood
Floodplain Forest

Black Locust – Sycamore – Cottonwood Floodplain Forest

- Recent deposits, such as islands or point bars
- Recently reforested
- Flooded > once/year with fast-flowing water
- Spring ephemerals not rich, mid-summer herbs tall, but not dense (many “weeds”)
- Invasive shrubs can be dense

=> Probably one of the earliest successional stages, which might persist in locations with high natural disturbance frequency and intensity

	Floodplain Forest Type				
	Sugar Maple - dominated	Elm - Sugar M. - Bitternut	Elm - Ash - Black Cherry	Black Locust - Sycamore - Cottonwood	Green Ash - Silver Maple
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Spicebush	4	0	1	0	25**
Swamp White Oak	0	0	1	0	15*


Green Ash – Silver Maple Floodplain Forest

Green Ash – Silver Maple Floodplain Forest

- Low floodplain with depressions that don't drain freely into the creek
- Ancient and recently reforested
- Flooded > once/year with slow-flowing water, water pools and slowly percolates into the ground
- Spring ephemerals sparse, mid-summer herbs very tall and dense (think: Woodnettle!)

=> Maybe a "climax" community as long as the intense flooding regime is maintained?

Many native plants were observed exclusively (or mostly) in ancient floodplain forests, among them

- Blue Cohosh
- Broad-leaved Spring Beauty
- Red and White Baneberry
- Cardinal Flower
- Lopseed
- Aniseroot
- Sweet Cicely
- Mayapple
- Meadow Lily

While these recently reforested floodplains are an improvement from a corn field in many aspects, they don’t harbor the same native plant communities as the ancient floodplain forests.

Remnants of ancient floodplain forest deserve priority for conservation.

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