

Historical Introduction Routes of Invasive Plants to Pennsylvania

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Issues with Invasives

- Introduction causes or is likely to cause economic or environmental harm or harm to human health
- Are the cause of 18% of endangered and threatened species, have contributed to the decline of 42%
- Harms agricultural productivity, public utility operations, outdoor recreation, and property values.
- \$1.288 Trillion globally over the past 50 years



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Historical Invasion Routes

- Identifying introduction origins
- Conducive Habitats
- Vegetation morphology



Efforts Against Invasives

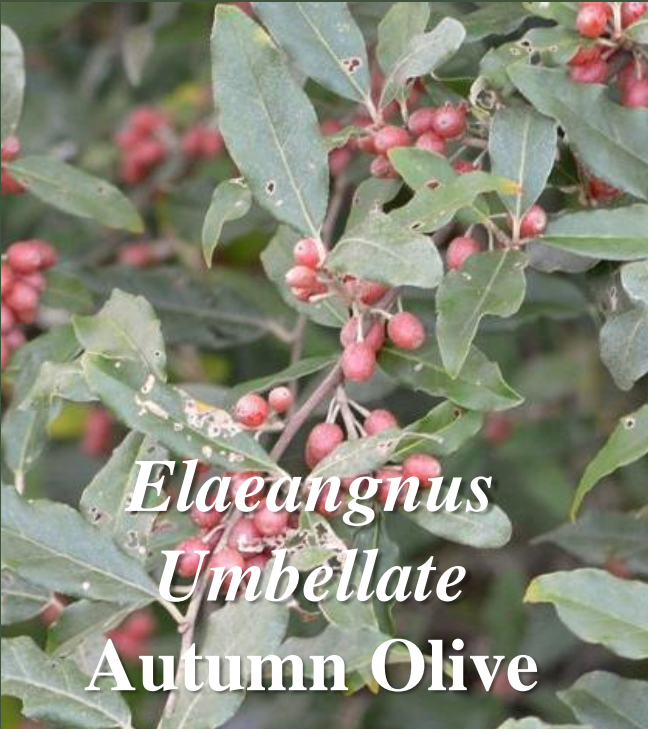
- Lack of established protocols
- Biological controls- chemical, mechanical, biotic
- Monitoring efforts
- 1990- Invasives deemed a significant component of environmental changes



Purpose

- Determine spread of invasive species
- Reduce future invasions
- Identify possible advantages of morphology
- Education
- <40% of PA consumers know their plants are invasive





Model Species

- Vegetation forms
- Horticultural status
- 174-23 samples

Hedera helix
English Ivy

Pueraria montana
Kudzu

Elaeagnus
Umbellata
Autumn Olive

Pyrus calleryana
Bradford Pear

Vinca minor
Periwinkle

Hemerocallis fulva
Orange Daylily

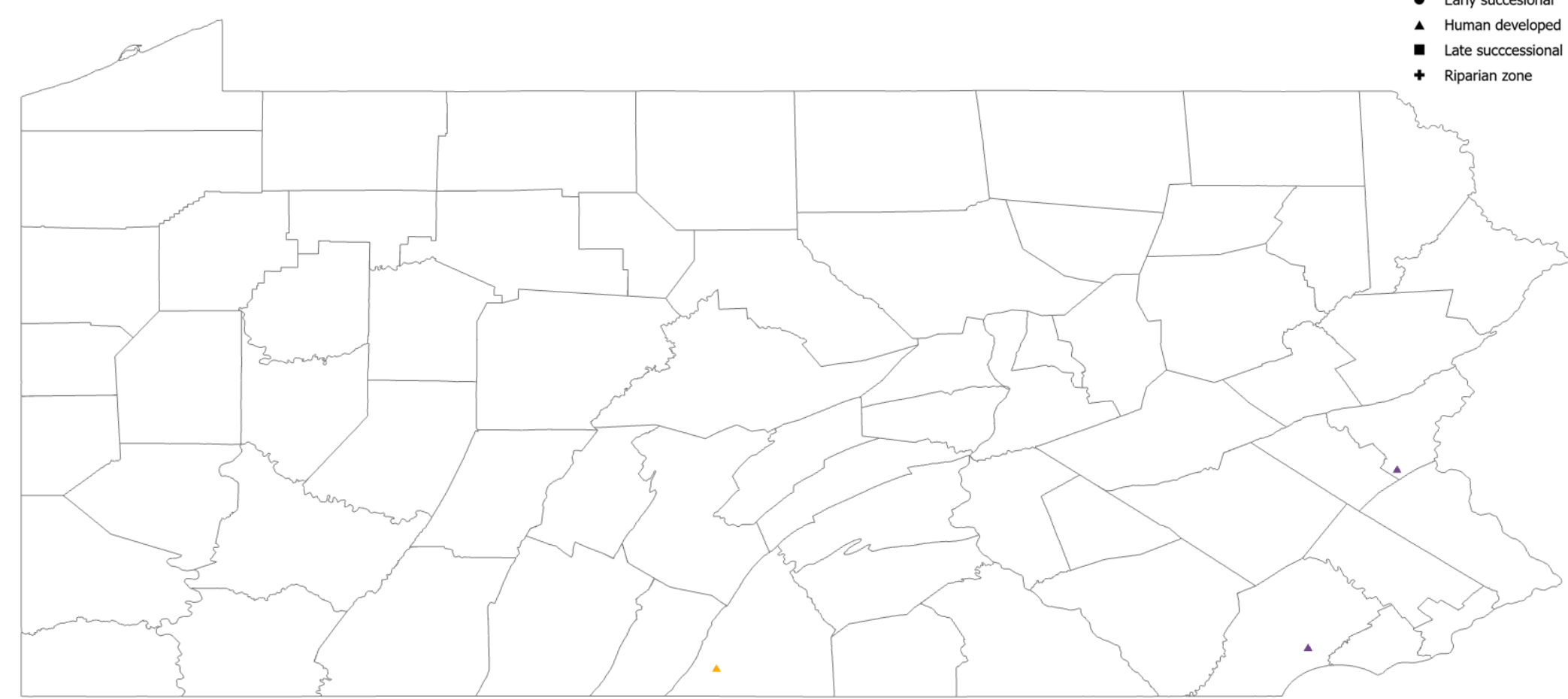
Material and Methods

- Southeast Regional Network of Expertise and Collections (SERNEC).
- 233 herbaria spanning 200 years
- 475 species
- Organization & Habitats
- Esri: GIS mapping software
- Callery pear, Bradford cultivar & Montgomery county

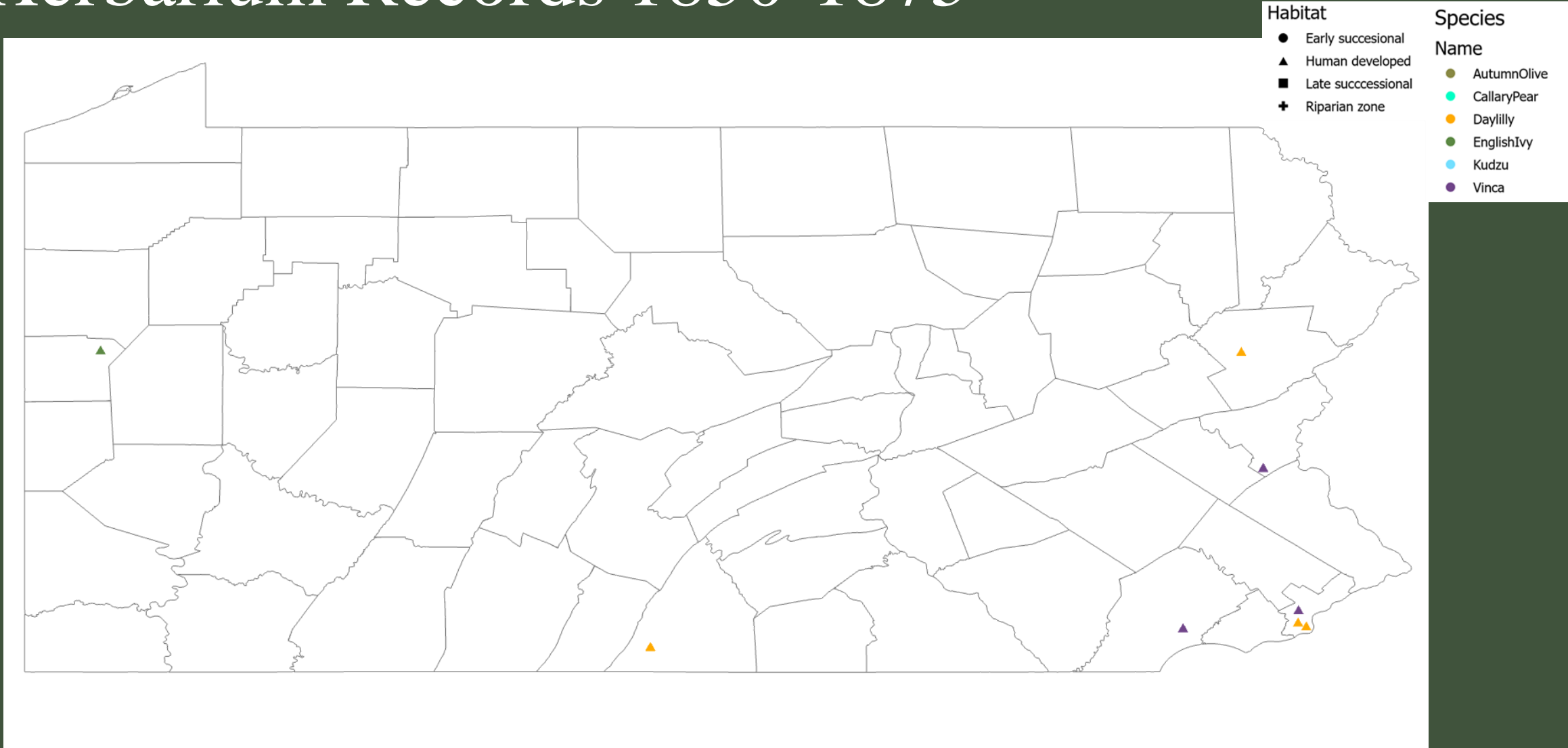
1949-07-03	United States	Pennsylvania	Monroe	Scotrun	41.065924	-75.319906	stream margin
1968-08-09	United States	Pennsylvania	Carbon	1 mile NW of Trauchsville	40.891172	-75.542906	bottomland
1975-07-22	United States	Pennsylvania	Carbon	E of Packerton	40.855091	-75.719079	ballast
1968-07-19	United States	Pennsylvania	Carbon	1 mile NE of Beltzville	40.850339	-75.621921	bottomland
1969-07-17	United States	Pennsylvania	Carbon	1 mile NE of Big Creek	40.857647	-75.633047	bottomland
1967-07-26	United States	Pennsylvania	Carbon	1 mile N of Forest Inn	40.870942	-75.593114	roadside
1965-07-19	United States	Pennsylvania	Northampton	Bethlehem	40.625932	-75.370458	bushy field
1976-07-28	United States	Pennsylvania	Lehigh	1 mile N of Slatington	40.762921	-75.611853	alluvial woods
1980-07-15	United States	Pennsylvania	Lehigh	1 mile SE of Dorneyville	40.564849	-75.506137	roadside bank
1975-07-12	United States	Pennsylvania	Lehigh	1 mile NE of Center Square, Allentown	40.612488	-75.458178	ballast
1971-07-16	United States	Pennsylvania	Lehigh	1/2 mile S of Center Square, Allentown	40.594995	-75.471675	fallow area
1973-07-31	United States	Pennsylvania	Lehigh	2 miles SE of Dorneyville	40.554598	-75.492645	roadside
1973-07-23	United States	Pennsylvania	Lehigh	1 mile N of Slatington	40.762921	-75.611853	shore
1981-07-16	United States	Pennsylvania	Lehigh	W of Catasaquua	40.654819	-75.474627	alluvium
1948-07-31	United States	Pennsylvania	Lehigh	1 mile W of Fullerton	40.631762	-75.492335	roadside

Herbarium Records Pre-1850

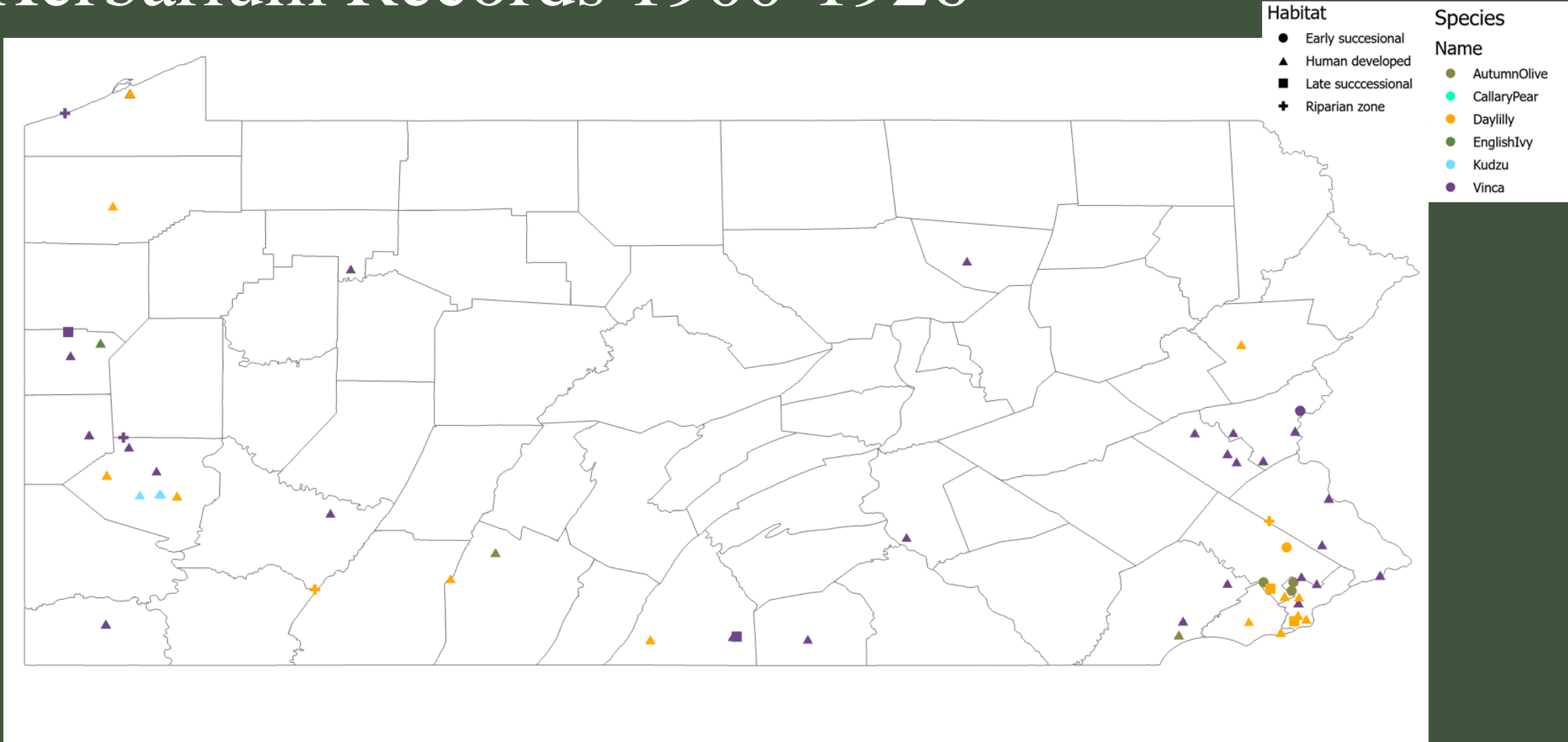
Habitat		Species	
●	Early successional	●	AutumnOlive
▲	Human developed	●	CallaryPear
■	Late successional	●	Daylilly
+	Riparian zone	●	EnglishIvy
		●	Kudzu
		●	Vinca



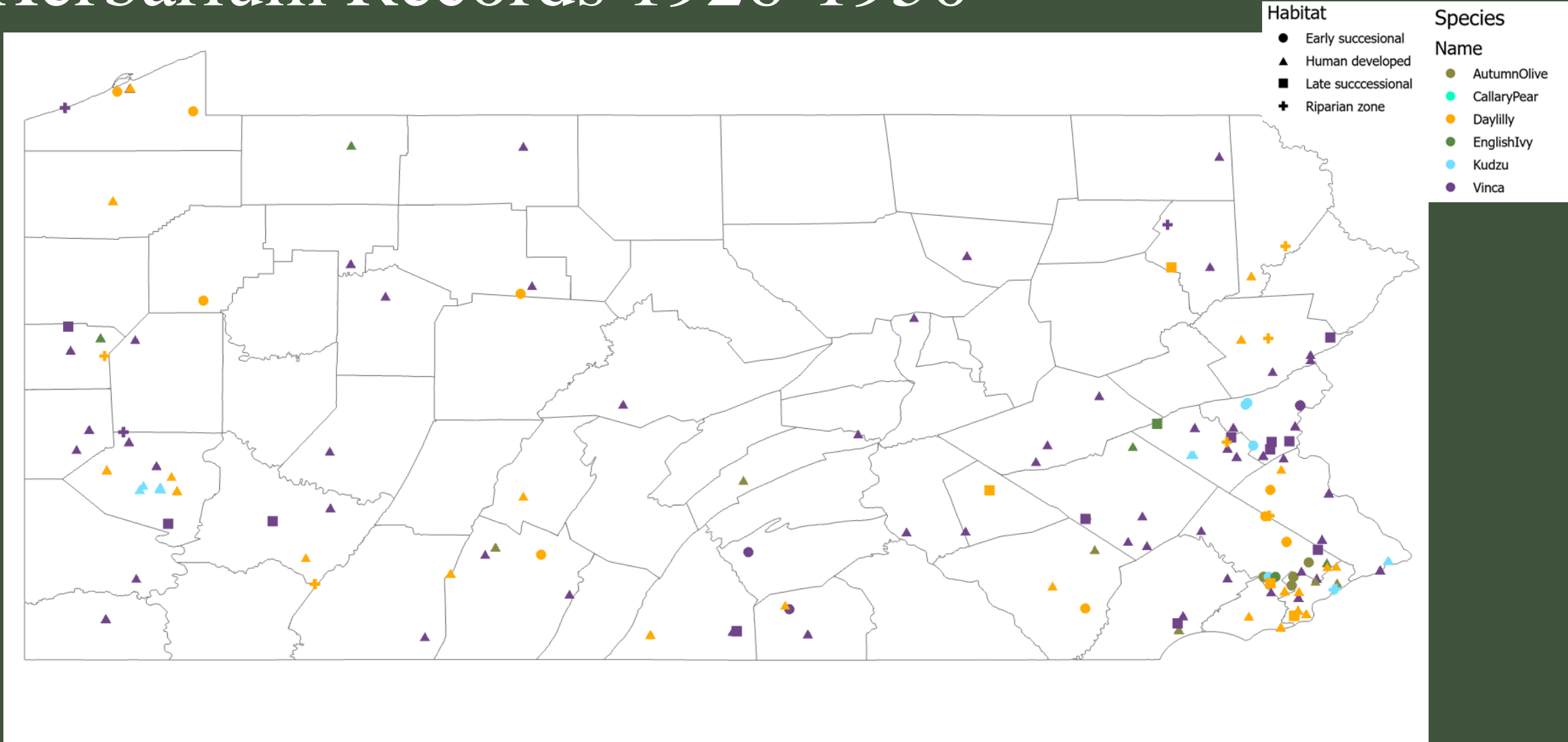
Herbarium Records 1850-1875



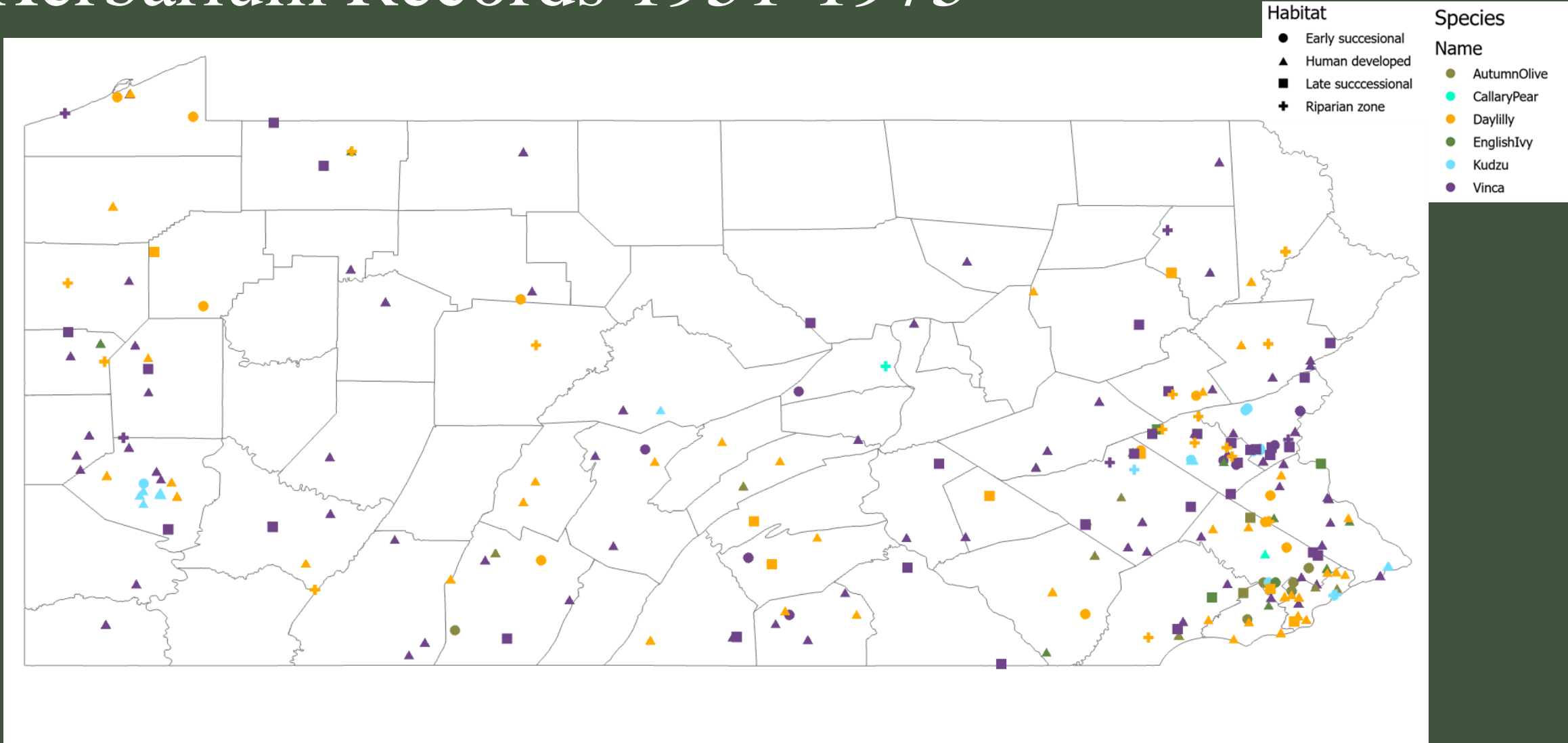
Herbarium Records 1900-1926



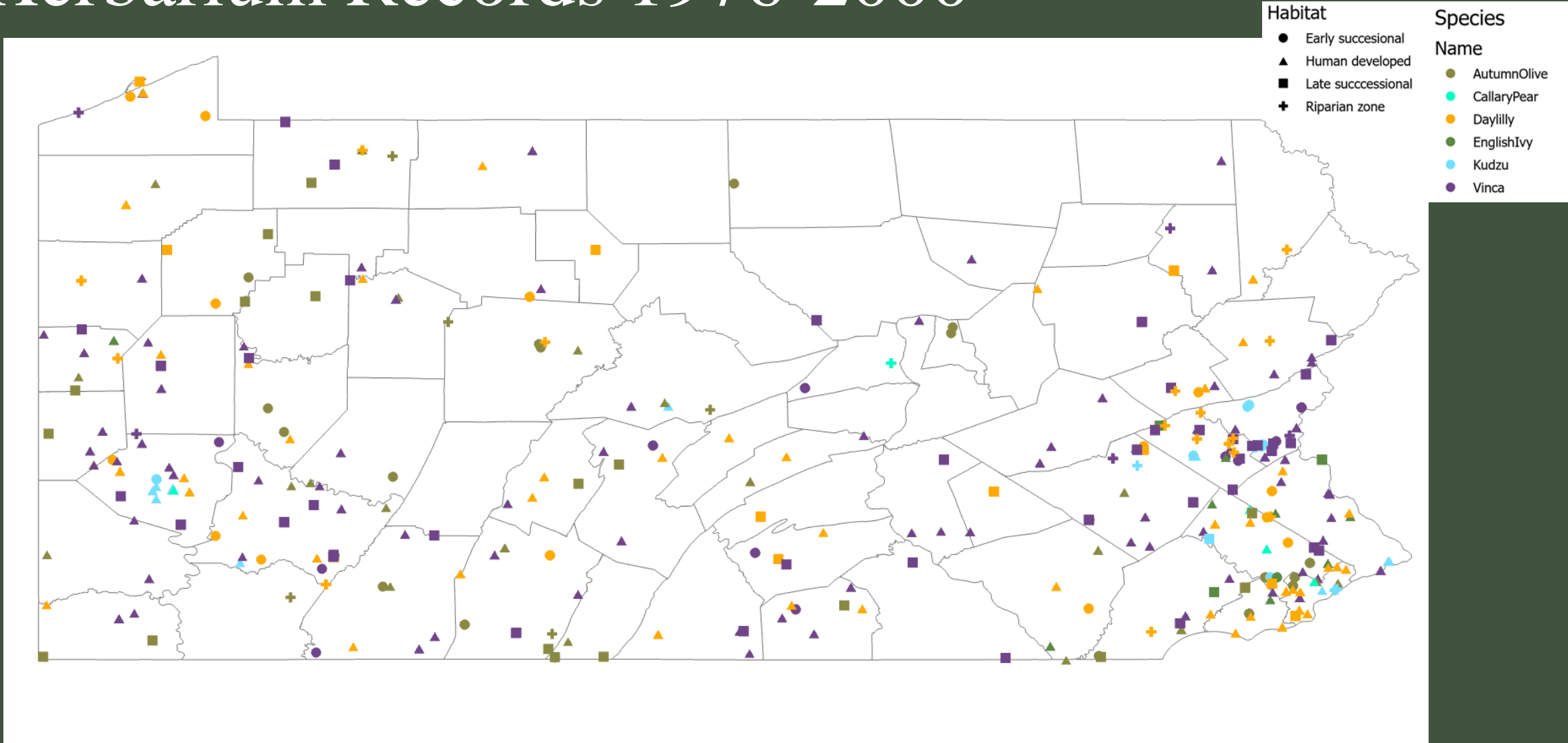
Herbarium Records 1926-1950



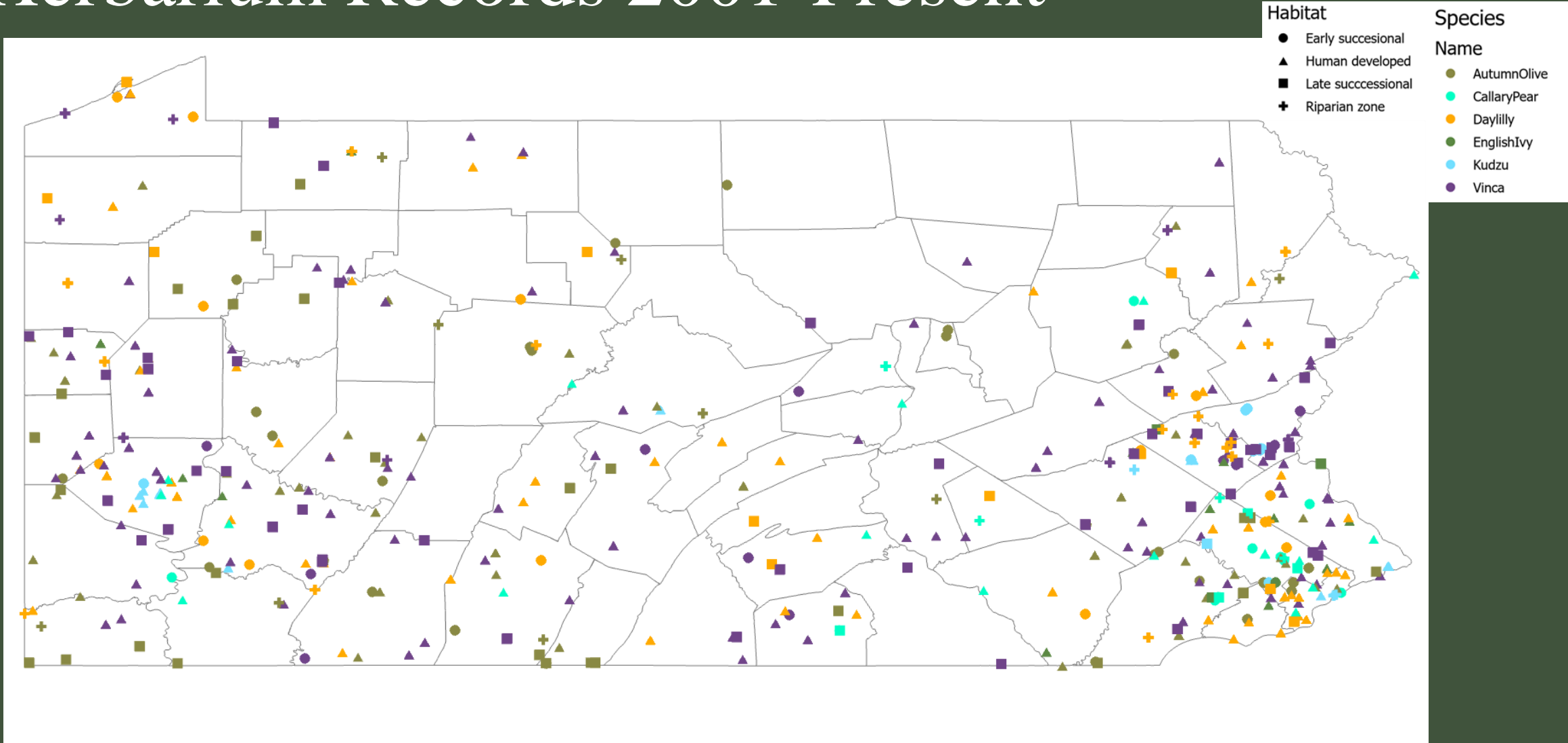
Herbarium Records 1951-1975



Herbarium Records 1976-2000

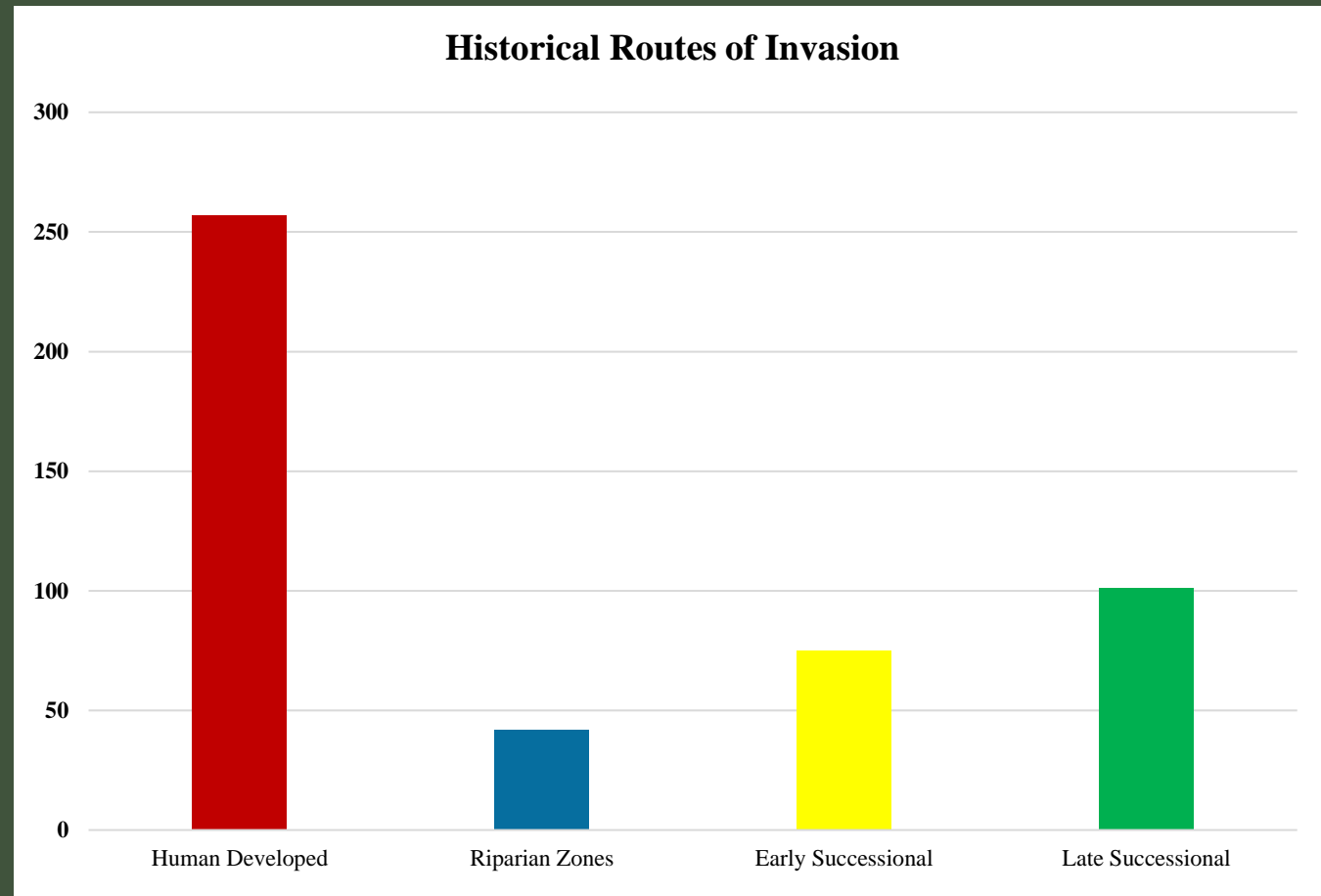


Herbarium Records 2001-Present



Results

- 257 Human developed
- 101 Late successional
- 75 Early successional
- 42 Riparian zones
- Periwinkle vs Autumn Olive
- Orange daylily and Periwinkle



Error Sources & Future Endeavors

- Collector dispersal
- Accuracy of GPS
- Hydrogeological factors
- Source from other herbariums
- How are they spreading away from human developed areas



Conclusions

- Human development
- What does this mean for the future?
- Box stores/ Conscious consumer/ Educate others.



References

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