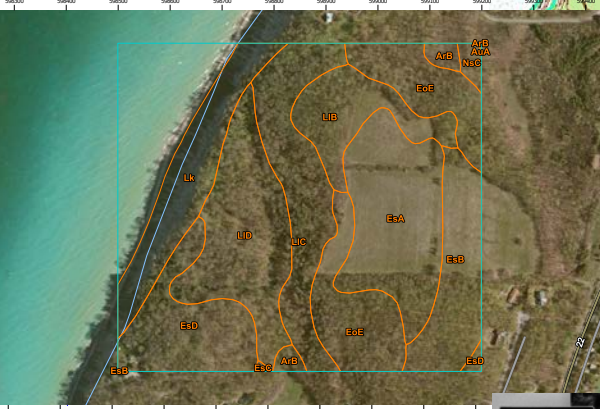
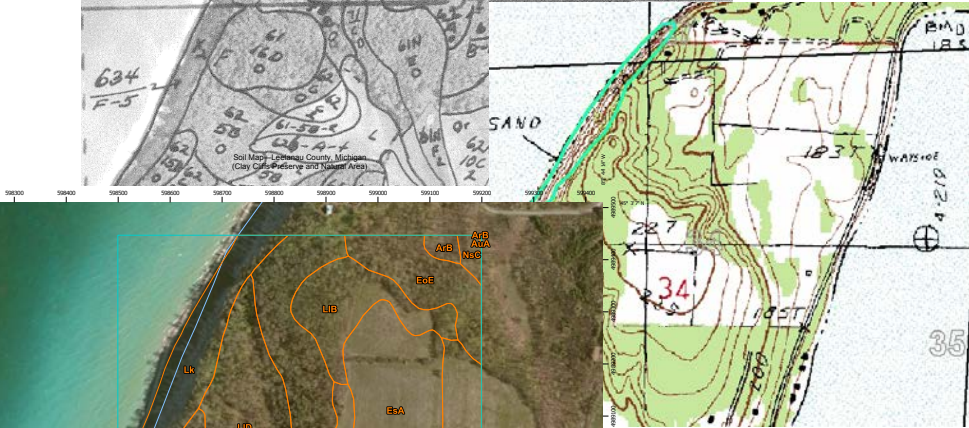




Reference Data



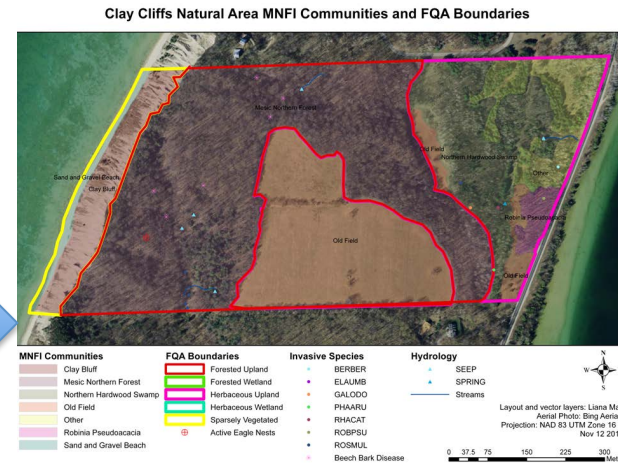
Map Scale: 1:5,000 (printed on a landscape 11" x 8.5" sheet)
 0 250 500 1000 1500 Feet
 Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84
 Natural Resources Conservation Service Web Soil Survey National Cooperative Soil Survey



Liana May

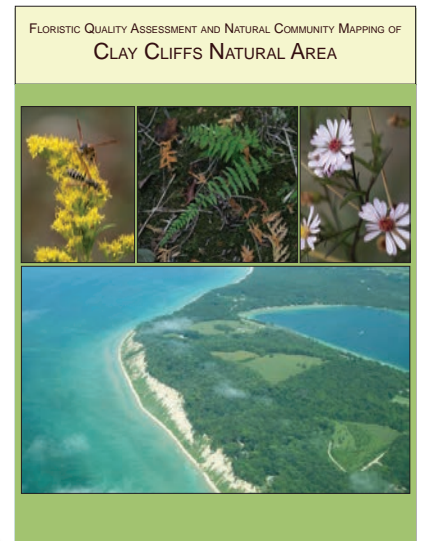


Field Survey Data



Integrated Maps

Management Plans



Site: Clay Cliffs Natural Area
 Locale: Leelanau Co, MI
 By: Liana May

FLORISTIC QUALITY DATA				Wetness				Physiognomy				Common Name			
Acronym	C	Scientific Name	W	Wetness	Physiognomy	Common Name	Wetness	Physiognomy	Common Name	Wetness	Physiognomy	Common Name	Wetness	Physiognomy	Common Name
ACEPLA	0	ACE PLADODICES	5	UPL	Ad Tree	NORWAY MAPLE	5	UPL	Ad Tree	SUGAR MAPLE	5	UPL	Ad Tree	SUGAR MAPLE	5
ACESAU	5	Aster saccharum	3	FACU	Nf Tree	MOUNTAIN MAPLE	3	FACU	Nf Tree	YARROW	3	FACU	Nf Tree	YARROW	3
ACESPI	1	Aster spicatum	3	FACU	Nf Tree	YARROW	3	FACU	Nf Tree	YARROW	3	FACU	Nf Tree	YARROW	3
ACHMIL	1	Achillea millefolium	3	FACU	Nf P-Fort	YARROW	3	FACU	Nf P-Fort	YARROW	3	FACU	Nf P-Fort	YARROW	3
ACHREP	0	ACHROPSYCH REPENS	3	FACU	Ad P-Grass	QUACK GRASS	3	FACU	Ad P-Grass	QUACK GRASS	3	FACU	Ad P-Grass	QUACK GRASS	3
ACHSTRA	0	Achillea strobilata	3	FACU	Nf P-Grass	SILVER WHEAT GRASS	3	FACU	Nf P-Grass	SILVER WHEAT GRASS	3	FACU	Nf P-Grass	SILVER WHEAT GRASS	3
ACHGOT	0	ACHROPSYCH GOTHARD	3	FACU	Ad P-Fort	COIN COCKLE	3	FACU	Ad P-Fort	COIN COCKLE	3	FACU	Ad P-Fort	COIN COCKLE	3
ACHGIG	0	ACHROPSYCH GIGANTEA	3	FACU	Ad P-Grass	RESTOP	3	FACU	Ad P-Grass	RESTOP	3	FACU	Ad P-Grass	RESTOP	3
ALLPET	0	ALLIARIA PETIOLATA	3	FACU	Ad P-Fort	GARLIC MUSTARD	3	FACU	Ad P-Fort	GARLIC MUSTARD	3	FACU	Ad P-Fort	GARLIC MUSTARD	3
AMBART	0	Antennaria artemisioides	3	FACU	Nf P-Grass	COMMON RAGWEE	3	FACU	Nf P-Grass	COMMON RAGWEE	3	FACU	Nf P-Grass	COMMON RAGWEE	3
AMBARR	4	Antennaria artemisioides	3	FACU	Nf P-Grass	JUNEWEED	3	FACU	Nf P-Grass	JUNEWEED	3	FACU	Nf P-Grass	JUNEWEED	3
AMBARR	10	Antennaria trivittata	3	FACU	Nf P-Grass	MARSH GRASS	3	FACU	Nf P-Grass	MARSH GRASS	3	FACU	Nf P-Grass	MARSH GRASS	3
ANUMAR	3	Anemone canadensis	5	UPL	Nf P-Fort	PEARLY EVERLASTING	5	UPL	Nf P-Fort	PEARLY EVERLASTING	5	UPL	Nf P-Fort	PEARLY EVERLASTING	5
ANECAN	4	Anemone canadensis	3	FACU	Nf P-Fort	CANADA ANEMONE	3	FACU	Nf P-Fort	CANADA ANEMONE	3	FACU	Nf P-Fort	CANADA ANEMONE	3

Species Lists and Quality Assessments

Different Surveys for Different Needs

- Rapid Ecological Assessment
- Floristic Quality Assessment
- Threatened and Endangered Species Survey
- Wetland Delineations
- Invasive Species Surveys
- Natural Community Mapping
- Indicator Species Surveys
- Breeding / Migrating / Christmas Bird Surveys
- Citizen Science Studies

Example: Floristic Quality Assessment

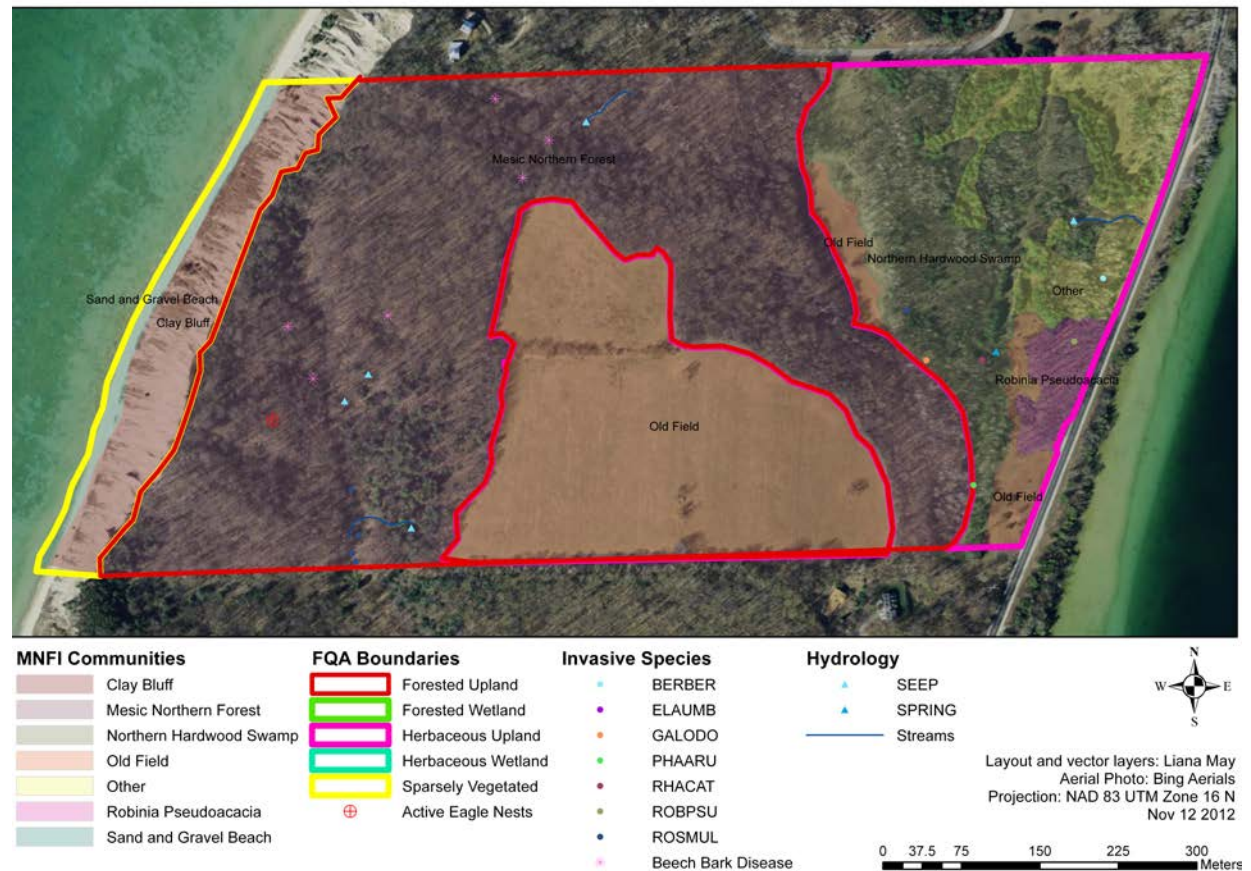
Rates the “Pre-European settlement condition” of an area, in other words, the naturalness, or relative disturbance level.

Used to compare different areas, or, the same area at different points in time.

Floristic Quality Assessment

I. Delineate Communities

Clay Cliffs Natural Area MNFI Communities and FQA Boundaries



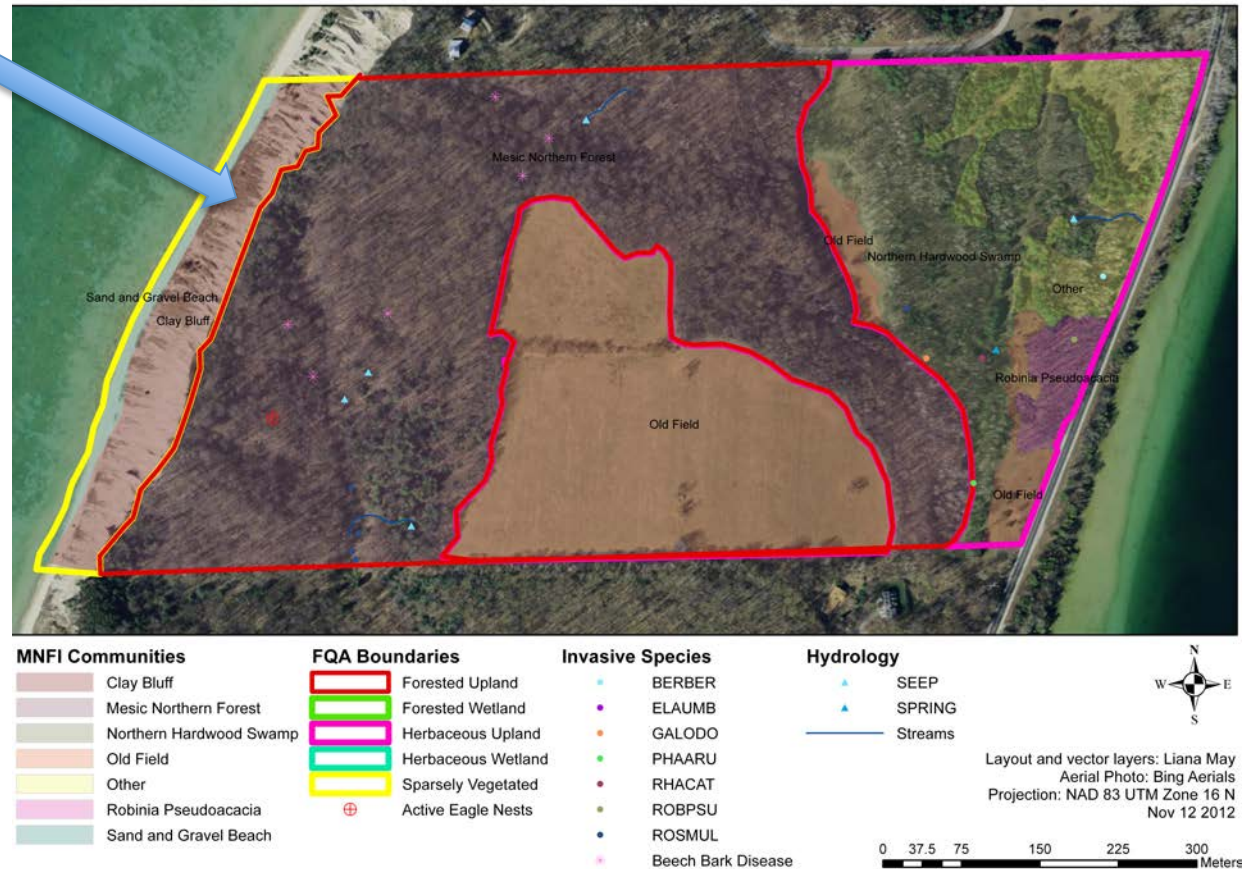
Floristic Quality Assessment

Clay Bluff & Beach



I. Delineate Communities

Clay Cliffs Natural Area MNFI Communities and FQA Boundaries



Floristic Quality Assessment

I. Delineate Communities

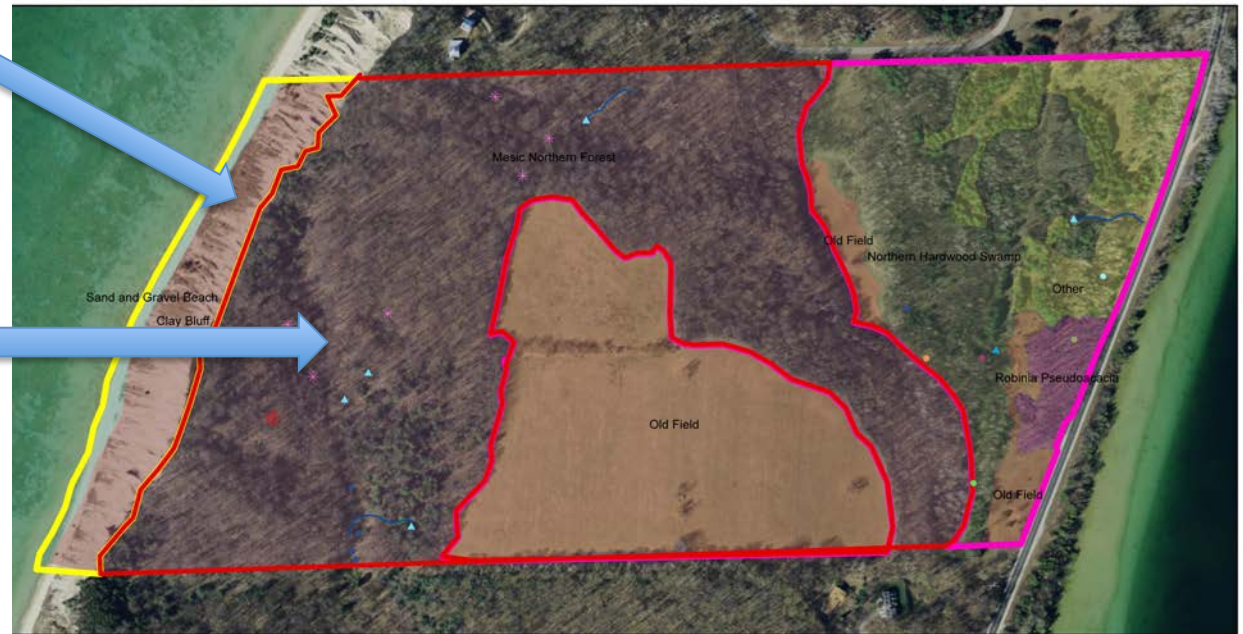
Clay Bluff & Beach



Mesic Northern Forest



Clay Cliffs Natural Area MNFI Communities and FQA Boundaries



MNFI Communities	
	Clay Bluff
	Mesic Northern Forest
	Northern Hardwood Swamp
	Old Field
	Other
	Robinia Pseudoacacia
	Sand and Gravel Beach

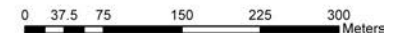
FQA Boundaries	
	Forested Upland
	Forested Wetland
	Herbaceous Upland
	Herbaceous Wetland
	Sparsely Vegetated
	Active Eagle Nests

Invasive Species	
	BERBER
	ELAUMB
	GALODO
	PHAARU
	RHACAT
	ROBPSU
	ROSMUL
	Beech Bark Disease

Hydrology	
	SEEP
	SPRING
	Streams



Layout and vector layers: Liana May
Aerial Photo: Bing Aerials
Projection: NAD 83 UTM Zone 16 N
Nov 12 2012



Floristic Quality Assessment

I. Delineate Communities

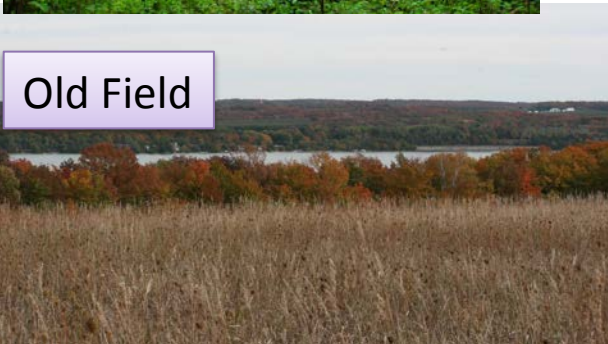
Clay Bluff & Beach



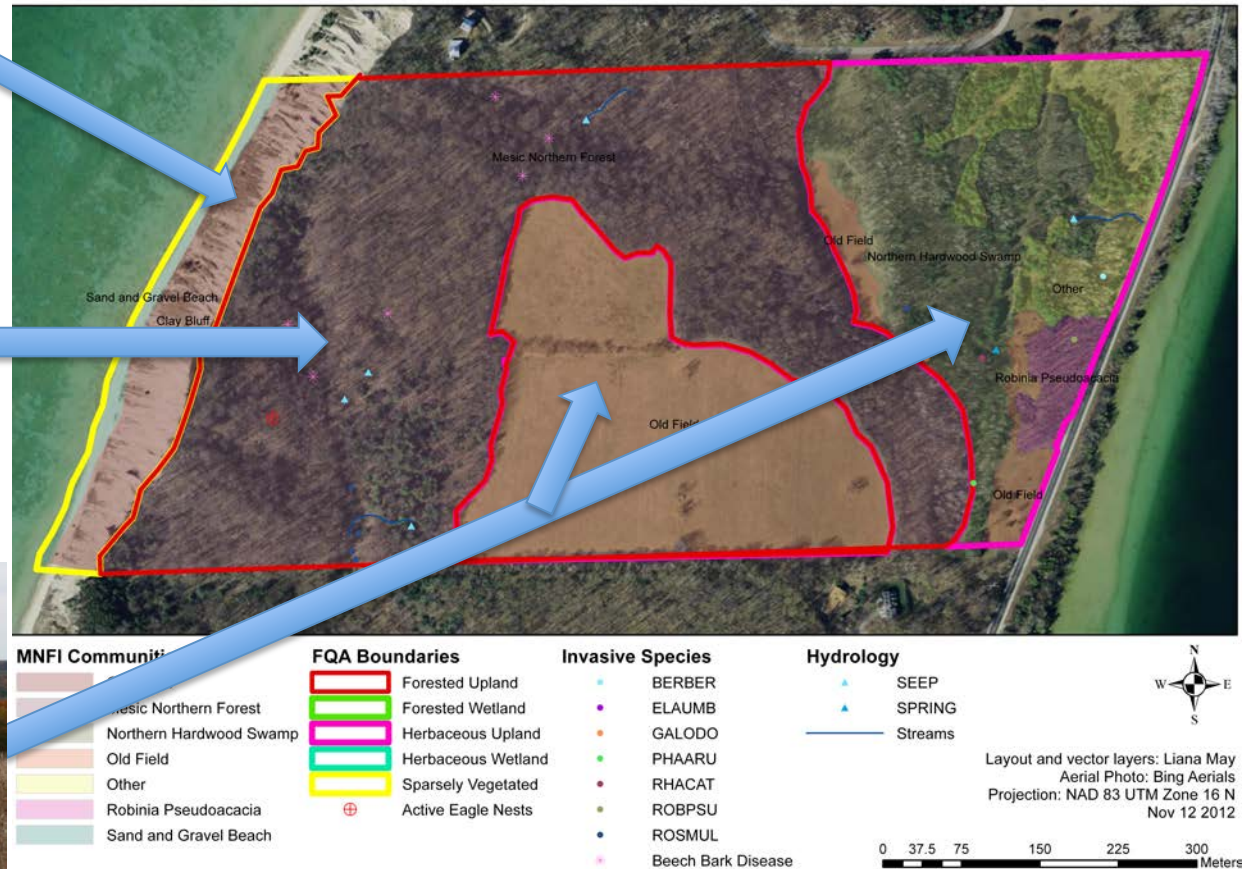
Mesic Northern Forest

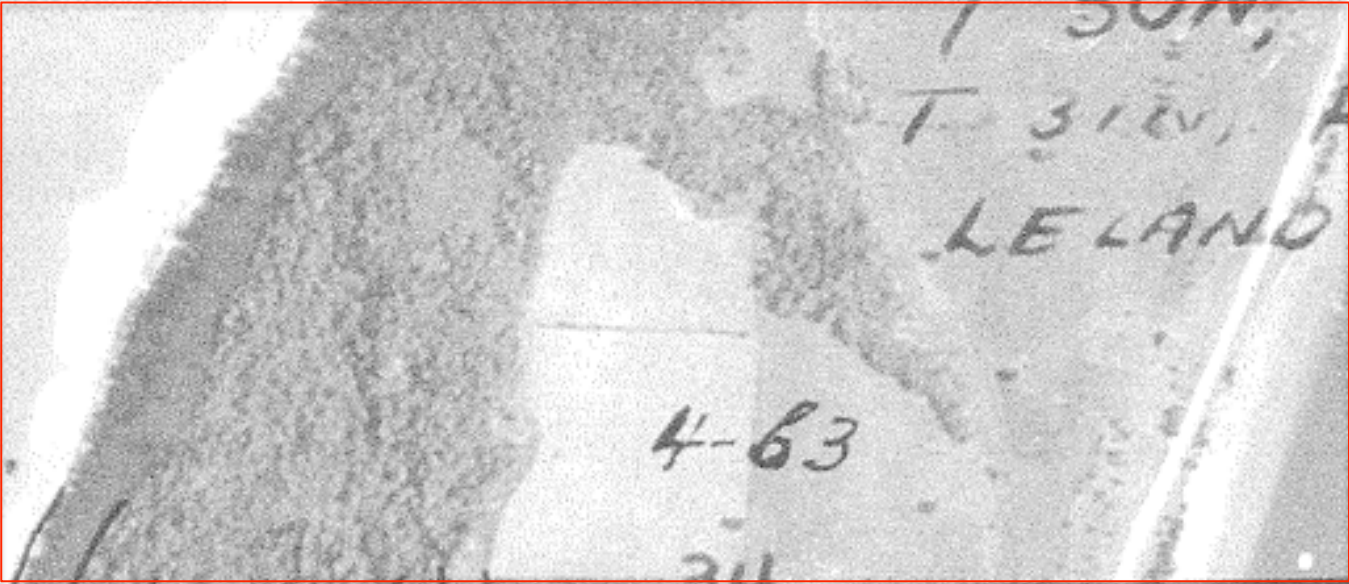


Old Field



Clay Cliffs Natural Area MNFI Communities and FQA Boundaries

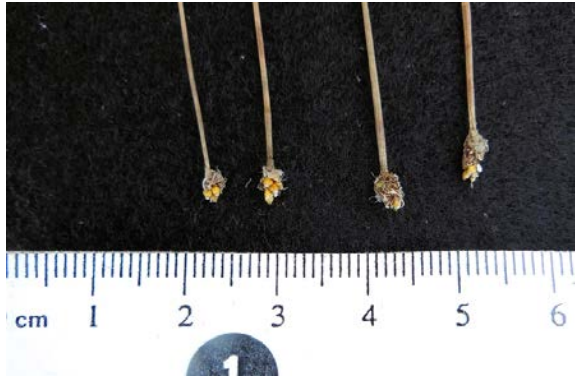




1938 Aerial B&W available at the Leelanau Conservation District

Floristic Quality Assessment

- I. Delineate Communities
- II. Survey Plants (Animals)



Floristic Quality Assessment

- I. Delineate Communities
- II. Survey Plants and Make Lists
- III. Assign Plant Conservation “C” Values

UniversalFQA.org



More Example High Conservation-Value Indicator Plants

Photos from Michigan Flora

Dutchman's Breeches and Squirrel Corn (Dicentra)



Beechdrops

Yellow lady's slipper

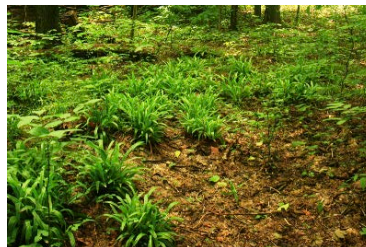


Pitcher's thistle

Bearberry / Kinnikinick



Plantain-leaved sedge



Marsh marigolds

Floristic Quality Assessment

- I. Delineate Communities
- II. Survey Plants and Make Lists
- III. Assign Plant Conservation “C” Values
- IV. Calculate Quality “FQI”

$$\textit{Floristic Quality Index} = ((\Sigma C) / n) * \sqrt{n}$$

0-25 = minimal conservation value

25-50 = significant conservation value

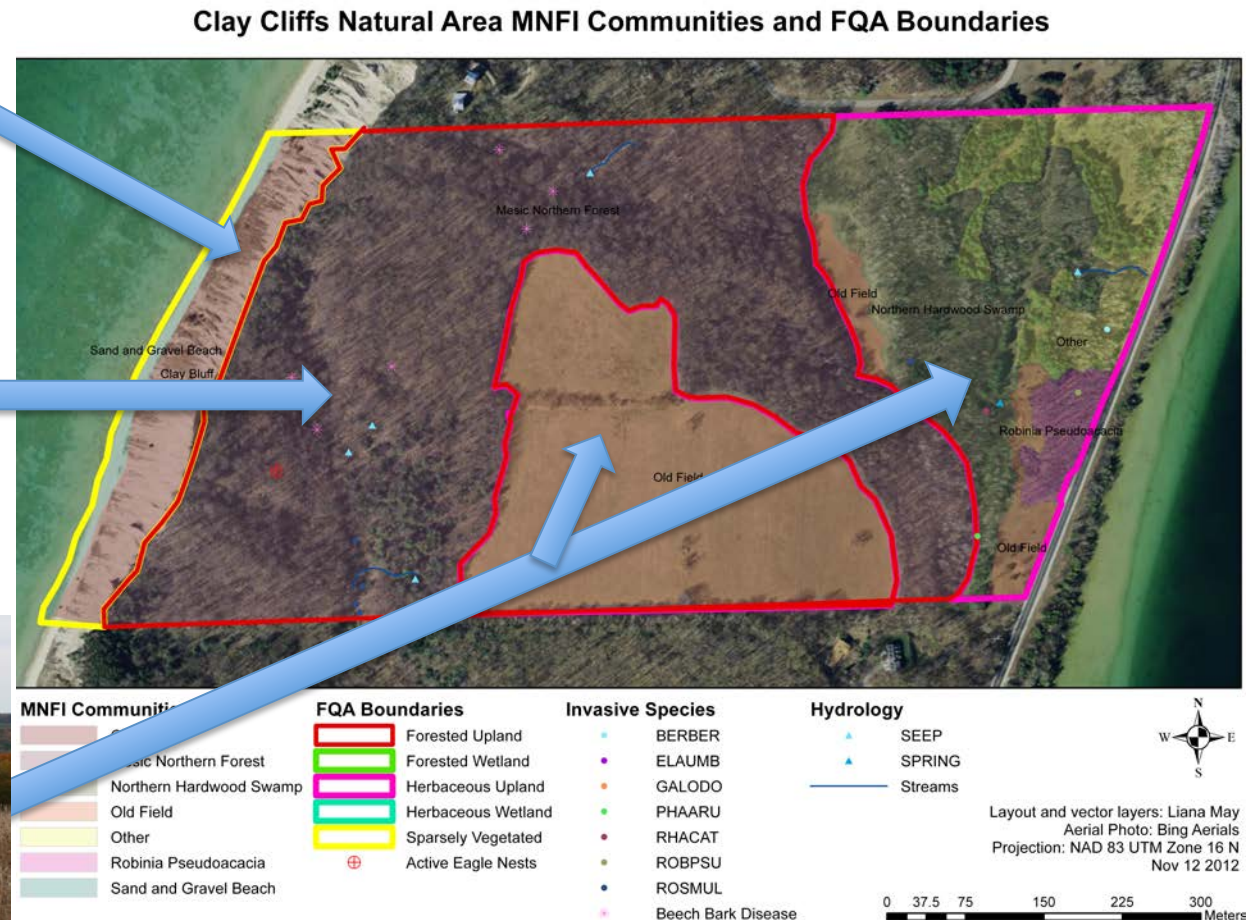
>50 = extremely rare and biologically important

mean C value

metric for standardizing
effect of richness (n)

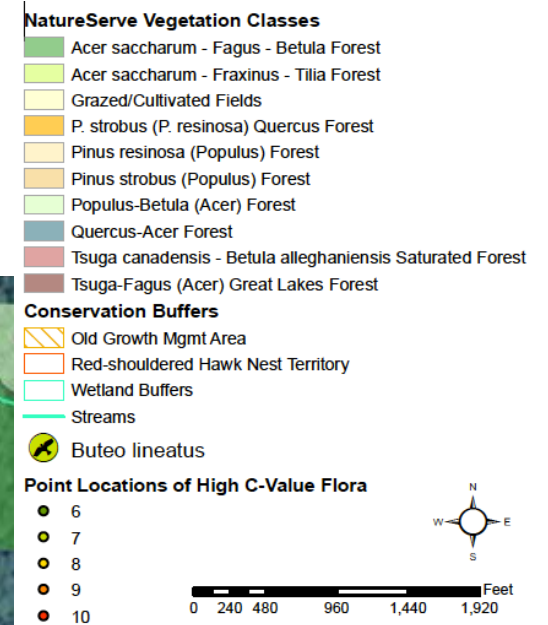
Floristic Quality Assessment

Make Comparisons



Floristic Quality Assessment

Locate Conservation Priorities



Many high
"C" value
native
taxa
in wetland

Lower
diversity and
"C" values

Information for Management

- Detailed property descriptions
- Detailed plant taxa inventory and documentation with State
- Invasive species types and locations
- Rare and endangered species locations and documentation with State
- Identify unique or biodiverse habitats
- Delineates wetlands and natural communities

Online Survey Tools for Landowners

- Michigan Natural Features Inventory (lots of info)
 - <http://mnfi.anr.msu.edu/>
- Michigan Flora (Plant ID)
 - <http://michiganflora.net/>
- Northwest Michigan Invasive Species Network
 - <http://habitatmatters.org/>
- iNaturalist (species location app)
 - <https://www.inaturalist.org>
- Leelanau County Maps (Aerial and Informative)
 - <http://www.leelanau.cc/landmaps.asp>
- Leelanau Conservation District
- Universal FQA (calculates FQIs)
 - <http://universalfqa.org/>
- Google Earth (digital mapping)

A Few Citizen Science Projects & Resources

- Trout Lily Pollen Survey
 - <https://troutlilysurvey.wordpress.com/>
- National Phenology Network
 - <https://www.usanpn.org/>
- Christmas Bird Count
 - <https://www.audubon.org/conservation/science/christmas-bird-count>
- Michigan Herp Atlas (Reptiles and Amphibians)
 - <https://www.miherpatlas.org/>
- Midwest Invasive Species Information Network
 - <http://www.misin.msu.edu/>
- Tip of the Mitt Watershed Council
 - <http://www.watershedcouncil.org/>

THANK YOU!

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