**Attachment V.**

**1. Clearing**

1.01. Recent or active clearing
- QI: Dominance by one or a few plant species
- QI: Clearing/maintenance of open conditions along corridor or right-of-way by infrequent mowing

1.02. Former clearing
- QI: Boundary between communities/vegetation types is extra sharp or rectilinear
- QI: Young trees growing in a dense stand
- QI: Dead *Juniperus virginiana* trees standing beneath overstory layer

1.98. Unknown clearing effect

1.99. Other clearing effect

**2. Cultivation**

2.01. Plowing or other tilling
- QI: Distinct vegetation pattern, not obviously related to environmental patchiness
- QI: Low species diversity
- QI: Dominance by one or a few plant species
- QI: Weedy herbaceous plants (native or non-native)
- QI: Exotic species
- QI: *Juniperus virginiana* growing anywhere except on/near bedrock outcrops or natural firebreaks
- QI: Boundary between communities/vegetation types is extra sharp or rectilinear

2.98. Unknown cultivation effect

2.99. Other cultivation effect

**3. Deer Overabundance**

3.01. Damage to the native herbaceous flora and woody vegetation (including prevention of recruitment)
- QI: Gap in tree size classes
- QI: Lindera benzoin browsed

3.02. Encouragement of weedy and unpalatable plants
- QI: Overabundance of *Asimina triloba*
- QI: Abundance of thorny plants
- QI: Weedy herbaceous plants (native or non-native)
- QI: Abundance of native “hitchhiker” herbs with stickery fruits

3.03. Damage to the soil (trampling, erosion)

3.98. Unknown effect from deer overabundance

3.99. Other effect of deer

**4. Drainage**

4.01. Ditching for surface drainage (including stream channelization)
- QI: Ditches

4.02. Subsurface drainage tile line
- QI: Ditches

4.03. Groundwater drawdown from wells (including irrigation systems)

4.04. Depletion of soil water by trees encroaching on a herbaceous wetland

Highlighted items added for this exercise

4.05. Change in vegetation composition or structure in response to drainage
QI: Young trees growing in a dense stand
QI: Wetland species growing on well-drained soil
4.98. Unknown drainage effect
4.99. Other drainage effect

**5. Earthmoving**
5.01. Excavation (digging a hole)
QI: Presence of *Equisetum arvense* and/or *Equisetum hyemale*
5.02. Filling (raising a mound or filling a low area)
5.03. Re-contouring the land surface (scraping and re-depositing soil)
QI: Distinct vegetation pattern, not obviously related to environmental patchiness
5.98. Unknown earthmoving effect
5.99. Other earthmoving effect

**6. Farming**
6.01. Deposition of soil at the edge of a field
6.02. Herbicide application and herbicide drift
6.03. Planting
6.98. Unknown farming effect
6.99. Other farming effect

**7. Faunal Exploitation and Disturbance**
7.01. Hunting, trapping, fishing
7.02. Disturbance by human visitation
7.03. Disturbance by urbanized and residential environs (roadkill, noise, lights, pets)
7.98. Unknown disturbance to animals
7.99. Other disturbance to animals

**8. Fire**
8.01. Reduction of invasive species (not including native woody encroachment)
8.02. Reduction of encroachment by fire-sensitive native species
8.03. Stimulation of fire-adapted native species
QI: Presence of *Erechtites hieracifolia*
QI: Presence of *Phytolacca americana*
8.04. Thinning of the structure of a fire-adapted woody community that has grown up because of fire suppression
8.05. Accelerated soil erosion
8.06. Stimulation of invasive vegetation
8.07. Consumption of leaf litter and woody debris
QI: Lack of leaf litter and duff buildup
QI: Fire scars
QI: Charred tree trunks and woody debris
8.08. Death or injury to woody plants (including re-sprouting and coppice growth)
QI: Lack of understory
QI: Abundant dead trees, standing
QI: Gap in tree size classes
QI: Open, discontinuous tree canopy and subcanopy

Highlighted items added for this exercise

QI: Small gaps in the tree canopy
8.98. Unknown fire effect
8.99. Other fire effect

**9. Fire Suppression**
9.01. Exotic cool-season grasses and other exotics fostered by a lack of fire
9.02. Fire-adapted, native species declining or not reproducing
9.03. Fire-sensitive, native species spreading into formerly fire-maintained habitat
QI: *Juniperus virginiana* growing anywhere except on/near bedrock outcrops or natural firebreaks
QI: Young trees growing in a dense stand
9.04. Increase in the density and canopy closure of woody vegetation
QI: Vigorous growth or abundance of *Juniperus virginiana*
9.05. Shade-pruning of major lateral crown limbs on overstory trees
QI: oldest trees display large, shade-pruned lateral limbs and stubs on mid to lower trunk
9.06. Suppression of vegetative growth, flowering, and fruiting
9.98. Unknown fire suppression effect
9.99. Other fire suppression effect

**10. Flooding**
10.01. Death of vegetation caused by unusually prolonged inundation
QI: Abundant dead trees, standing
10.02. Decrease in flooding (volume, velocity, duration, impact)
10.03. Increase in flooding (volume, velocity, duration, impact)
QI: Ditches
10.04. Mechanical injury of floodplain vegetation and scouring of the soil surface, promoting early successional vegetation
QI: Young trees growing in a dense stand
QI: Trees broken (limbs), scraped, knocked down, or partially pushed over
10.05. Seasonal water level fluctuation
10.06. Major stream downcutting
10.98. Unknown flooding effect
10.99. Other flooding effect
QI: Abundance of native “hitchhiker” herbs with stickery fruits

**11. Grazing**
11.01. Enhancement of snap diversity
11.02. Maintenance of habitat for native species that require bare soil and sparse vegetation
QI: Lack of leaf litter and duff buildup
11.03. Reduction or control of woody growth in a formerly fire-maintained community
11.04. Browsing and hedging of woody plants; creation of a browse line; suppression of woody reproduction; coppice growth
QI: Boundary between communities/vegetation types is extra sharp or rectilinear
QI: Lack of understory
QI: Gap in tree size classes
QI: Open, discontinuous tree canopy and subcanopy

Highlighted items added for this exercise

QI: Small gaps in the tree canopy

11.05. Decrease in favored forage species; reduction in the diversity and abundance of conservative native species
11.06. Increase or persistence of unpalatable or grazing-adapted species
QI: Abundance of *Asimina triloba*
QI: Abundant thorny plants
QI: Dominance by one or a few plant species
QI: Weedy herbaceous plants (native or non-native)
QI: Exotic species
QI: Abundance of native "hitchhiker" herbs with stickery fruits
QI: *Juniperus virginiana* growing anywhere except on/near bedrock outcrops or natural firebreaks
QI: Abundance of non-conservative (but not weedy) spring ephemerals
11.07. Soil erosion and compaction (trails, terracettes), root damage and injury or death of trees
QI: Abundant dead trees, standing
QI: Small gaps in the tree canopy
11.08. Current or abandoned fencing present
11.98. Unknown grazing effect
11.99. Other grazing effect

**12. Insects and Pathogens**
12.01. Disease damage
QI: Young trees growing in a dense stand
QI: Abundant dead trees, standing
12.02. Insect damage
QI: Young trees growing in a dense stand
QI: Abundant dead trees, standing
12.98. Unknown insect/pathogen effect
12.99. Other insect/pathogen effect

**13. Intrusions**
13.01. Building or group of buildings (homesite, farmstead), abandoned
QI: Presence of non-invasive horticultural species growing unintended
QI: Presence of old foundations, basements, cellars, chimneys, driveways, bricks, etc.
13.02. Building or group of buildings (homesite, farmstead), active
13.03. Road, active
13.04. Road, abandoned
13.05. Footpath or horse trail
13.06. Fence
13.07. Utility line, aboveground
13.08. Utility line, belowground
13.09. Other building, structure, or other intrusion
13.10. Dump, active
13.11. Dump, inactive
13.12. Cemetery
QI: Presence of non-invasive horticultural species growing unintended

Highlighted items added for this exercise

QI: *Juniperus virginiana* growing anywhere except on/near bedrock outcrops or natural firebreaks

13.13. Illegal ATV trail(s)

13.98. Unknown intrusion

13.99. Other intrusion

**14. Invasive Species**

14.01. Exotic invasive species

QI: Low species diversity

QI: Abundance of species commonly planted for wildlife food and cover

QI: Dominance by one or a few plant species

14.02. Native invasive species

QI: Low species diversity

QI: Dominance by one or a few plant species

14.98. Unknown invasive species effect

14.99. Other invasive species effect

**15. Logging**

15.01. Selective timber harvest

QI: Lack of large, well formed, high-value hardwoods

QI: Coppice growth

QI: Trees broken (limbs), scraped, knocked down, or partially pushed over

QI: Logging skid trails, haul roads, yarding areas, discarded cables

QI: Tree cutting, stumps, tops, logs

QI: Small gaps in the tree canopy

15.02. Clearcutting

QI: Dominance by few or one plant species

QI: Boundary between communities/vegetation types is extra sharp or rectilinear

QI: Lack of old trees in a mature stand of trees

QI: Logging skid trails, haul roads, yarding areas, discarded cables

QI: Tree cutting, stumps, tops, logs

15.03. Other tree-cutting (removal of firewood or hazardous trees)

QI: Tree cutting, stumps, tops, logs

15.04. Logging followed by release of advance regeneration and growth of new trees

QI: Young trees growing in a dense stand

15.98. Unknown tree-cutting effect

15.99. Other tree-cutting effect

**16. Mowing**

16.01. Mowing of herbaceous vegetation (other than haying)

QI: Exotic species

QI: Lack of leaf litter and duff buildup

16.02. Mowing of woody vegetation, not maintaining desirable native vegetation

QI: Dominance by one or a few plant species

QI: Boundary between communities/vegetation types is extra sharp or rectilinear

QI: Clearing/maintenance of open conditions along corridor or right-of-way by infrequent mowing

QI: Coppice growth

Highlighted items added for this exercise

16.03. Infrequent cutting of native vegetation (*e.g.* under a powerline) inadvertently maintaining desirable native vegetation
QI: Clearing/maintenance of open conditions along corridor or right-of-way by infrequent mowing
16.04. Haying
QI: Exotic species
QI: Lack of leaf litter and duff buildup
16.98. Unknown mowing effect
16.99. Other mowing effect

**17. Soil Movement, Erosion, and Deposition**
17.01. Sheet, rill, or gully erosion and deposition
17.02. Mass wasting (soil creep, slumping, rockfall)
17.03. Stream entrenchment
QI: Decrease in the frequency and duration of over-bank flooding
17.04. Stream meandering
QI: Young trees growing in a dense stand
17.05. Floodplain scouring or sedimentation
QI: Young trees growing in a dense stand
QI: Ditches
QI: Abundant dead trees, standing
17.06. Wind erosion and deposition
17.07. Bioturbation
17.98. Unknown soil movement, erosion, or deposition effect
17.99. Other soil movement, erosion, or deposition effect

**18. Water Impoundment**
18.01. Dam or dike
18.02. Inhibition of migration by aquatic life
18.03. Raising and stabilization of wetland water level (reduction or elimination of seasonal water-level fluctuations)
QI: Abundant dead trees, standing
18.98. Unknown water impoundment effect
18.99. Other water impoundment effect

**19. Water Pollution**
19.01. Oil or other chemical spill
19.02. Nutrient enrichment from cropland runoff and sewage effluent (including livestock containment operations and septic tanks)
19.03. Sedimentation
19.98. Unknown water pollution effect
19.99. Other water pollution effect

**20. Weather and Climatic Extremes**
20.01. Storm damage (windthrow, broken limbs)
QI: Young trees growing in a dense stand
QI: Dead trees, downed
QI: Lack of old trees in a mature stand of trees

Highlighted items added for this exercise

QI: Trees broken (limbs), scraped, knocked down, or partially pushed over
20.02. Drought
20.03. Temperature extremes (heat, cold)
20.98. Unknown effect from weather or climatic extreme
20.99. Other effect from weather or extreme climate

**21. Other Natural Biotic Processes**
21.01. Interspecific competition
QI: Overabundance of *Asimina triloba*
QI: Dominance by one or a few plant species
QI: Lack of understory
QI: Abundant dead trees, standing
21.02. Succession
QI: Patches of shrubs and saplings growing in a matrix of herbaceous vegetation
QI: Young trees growing in a dense stand
21.03. Beaver disturbance
QI: Young trees growing in a dense stand
QI: Abundant dead trees, standing
21.04. High rate of biological decomposition
QI: Lack of leaf litter and duff buildup
21.98. Unknown effect of a natural biotic process
21.99. Other effect of a natural biotic process

**22. Other Natural Abiotic Processes**
22.01. Presence of a clear or non-polluted stream
22.02. Seasonal fluctuations in water level
22.98. Unknown effect of a natural abiotic process
22.99. Other effect of a natural abiotic process

**23. Other Artificial Disturbances**
23.01. Herb gathering (root digging), flower-picking, mushroom hunting, plant poaching (orchids)

23.02. Seed gathering for off-site restoration
23.03. Damage from road salt runoff and spray
23.04. Soil contamination (petroleum or other chemicals other than road salt)
23.05. Mine subsidence
23.06. Damage to vegetation and soil by recreational visitors
QI: Abundance of native “hitchhiker” herbs with stickery fruits
QI: Lack of understory
23.07. Vegetation restoration and management (planting, killing plants)
QI: Abundance of vegetation commonly planted for wildlife food and cover
QI: Tree cutting, stumps, tops, logs
23.08. Clearing of understory
QI: Coppice growth
QI: Gap in tree size classes
23.09. Poaching
QI: Rocks noticeably disturbed (flipped over)

Highlighted items added for this exercise

23.10. Sites of human visitation
- QI: Presence of disposed refuse
- QI: Vandalism
- QI: Presence of campfire ring(s)
- QI; Rockclimbing

23.98. Unknown artificial disturbance
23.99. Other artificial disturbance

**24. Artificial Disturbances in General**

24.01. Past agricultural usage
- QI: Distinct vegetation pattern, not obviously related to environmental patchiness
- QI: Exotic species
- QI: Abundance of native "hitchhiker" herbs with stickery fruits

24.02. Disturbances that create bare soil
- QI: Abundance of *Ambrosia trifida*

24.03. Other human activities
- QI: Boundary between communities/vegetation types is extra sharp or rectilinear
- QI: Open, discontinuous tree canopy and subcanopy

**25. Natural Disturbances in General**

25.01. Disturbances modifying stand structure
- QI: Abundance of native "hitchhiker" herbs with stickery fruits
- QI: Open, discontinuous tree canopy and subcanopy

25.02. Disturbances that create bare soil
- QI: Abundance of *Ambrosia trifida*

**26. Unknown disturbance**

**27. No evident disturbance**

27.01. Possibly long-term absence of disturbance
- QI: Lack of stumps or logging evidence
- QI: Lack of non-native species
- QI: Presence of lichen/moss covered bedrock exposures
- QI: Well developed shrub layer (high structure and composition)
- QI: High structural integrity and diversity of mosses and lichens
- QI: Presence of northern glacial relict species
- QI: Presence of conservative fern species and/or high diversity of ferns
- QI: Lack of disturbance by recreational visitors

27.02. Old-growth conditions
- QI: Oldest trees display tall trunk, lack of lateral limbs
- QI: Dominance by one or a few plant species
- QI: Woody vegetation (*Quercus sp.*, *Carya sp.*, and *Vaccinium arboreum*) with small trunks, and many low, twisted, spreading, lateral limbs

27.03. Protection and recovery from a long period of past disturbance
- QI: Oldest trees display large, shade-pruned lateral limbs on mid to lower trunk

27.04. Big, old trees
- QI: Pit and mound topography

Highlighted items added for this exercise

QI: Relatively few, large-diameter limbs
QI: Presence of many large trees, spread throughout community
27.05. Lack of cultivation
QI: Pit and mound topography
27.06 Absence of degrading disturbances
QI: Presence of conservative species in general
QI: High overall plant diversity
27.07. Naturally sandy soil
QI: Presence of *Equisetum arvense* and/or *Equisetum hyemale*
27.08. A natural condition: The soil only appears to be well drained
QI: Wetland species growing on well-drained soil
27.09. Lack of degrading disturbances (grazing in particular)
QI: Presence of relatively conservative understory trees and shrubs
27.10. Long term stability and lack of disturbance
QI: Dead trees, downed
27.11. Wet or wet-mesic soil
QI: Lack of understory
27.12. Old age of trees (natural mortality)
QI: Abundant dead trees, standing
QI: Lack of old trees in a mature stand of trees
27.13. Other Quality Indicators related to high natural quality
QI: Presence of a buffer community
QI: High diversity of oak species
QI: Dominance by native, community obligate plant species
QI: Presence of critical habitat for rare and protected plant species
QI: Presence of critical habitat for rare and protected animal species
QI: High scenic quality
QI: Community structure favorable for heterogeneity of microhabitats

Highlighted items added for this exercise