

USGS-NPS Vegetation Mapping Program
Voyageurs NP Vegetation Mapping Project
Field Photo Album
September 2000

The Voyageurs National Park Vegetation Mapping Project is part of the USGS-NPS Vegetation Mapping Program, which is managed by the USGS Center for Biological Informatics (CBI). The USGS Upper Midwest Environmental Sciences Center (UMESC), The Nature Conservancy (TNC), Minnesota County Biological Survey (MCBS) of the Minnesota Department of Natural Resources, and Voyageurs National Park invested three field seasons to collect field data in support of the project. Along with these field efforts, numerous ground photographs were collected to capture representative map units, vegetation communities, and various field activities. Along with these field efforts, numerous ground photographs were collected to capture representative Map Units, Vegetation Communities, and various field activities.



*Paper Birch Forest on
Deer Point Islands*

- UMESC field reconnaissance and aerial photo ground survey activities to support map unit and vegetation community classification development, and to support vegetation photo interpretation.
- TNC/MCBS vegetation plot and accuracy assessment field activities to support vegetation community classification development and vegetation map accuracy assessment and analysis.
- All ground photos were collected during spring 1996 - fall 1998.

Many of the ground photographs have been scanned and made digitally available.

*** Key to Photo Credits**

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Reconnaissance on Kawawia Island

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Figure 2-4. Oblique View of Cranberry Bay



Figure 3-17. View from Dryweed Island – Canada in foreground.



Figure 2-20. Finding the best route. Recon #25; SF – Spruce-Fir/Mountain Maple Mesic Forest.



Figure 6-18. Established trails at Voyageurs NP are uncommon locator Lake Trailhead – Cranberry Creek Portage Trail.



Figure 8-17. Recon crew climbing rocky ridge; Shores of Junction Bay. JPW – Boreal Pine Rocky Woodland (jack pine phase)



Figure 2-25. Recon crew trails into a Peatland near Brule Narrows. LBC – Black Spruce/Leatherleaf Semi-tree Bog



Figure 5-9. Boating; the most effective means of transportation at VOYA



Figure 9-3. Boating; the most effective means of Transportation at VOYA



Figure 7-12. Releve' within the Cattails. CM - Midwest Cattail Deep Marsh



Figure 9-5. Overnight stay at Grassy Bay camp site



Figure 2-2. Discussing fly over plan at Frank Bay - Rainy Lake pilot Ron Hook (NPS) & Kevin Hop (USGS UMESC)



Figure 2-7. Cramped quarters within the float plane



Figure 2-14. Float plane for park fly over



Figure 2-12. Don Faber-Langendoen (TNC) boarding float plane near Duckfoot Island - Saginaw Bay



Figure 2-28. Field crew explores forest on Kawawia Island – Rainy Lake. Recon #31; RP - Red Pine/Blueberry Dry Forest



Figure 8-4. Surveying a forest on Deer Point Islands – Kabetogama Lake. Recon #43; PB - Paper Birch/Fir Forest



Figure 7-25. Ecologists discussing forest classification round Bear Island - Kabetogama Lake



Figure 8-10. Surveying wetland near Deer Point Islands - Kabetogama Lake. Recon #45; DS - Dogwood-Pussy Willow Swamp



Figure 5-25. Releve' team collecting vegetation plot data. Recon #37; TA – Northern Tamarack Rich Swamp



Figure 5-17. Releve' team taking advantage of an old logging trail. BSB – Black Spruce Bog



Figure 7-11. CM – Midwest Cattail Deep Marsh



Figure 9-9. Collecting vegetation plot data via boat. WRM – Wild Rice Marsh.



Figure 2-36. Recon team exploring a large beaver impoundment inland south of Kempton Channel - Rainy Lake



Figure 8-5. Collecting field data on Deer Point Islands - Kabetogama Lake. Recon #43; PB -Paper Birch/Fir Forest



Figure 9-6. JPF – Jack Pine/
Balsam Fir Forest. Veg plot #115;
west of Crane Lake



Figure P112a. JPF – Jack Pine/
Balsam Forest. Veg plot #112;
west of Blind Ash Bay -
Kabetogama Lake



Figure P136b. JPF – Jack Pine/
Balsam Forest. Veg plot #136;
Namakan Lake shores -
Kabetogama Peninsula.



Figure 5-13. RP – Red Pine/Blueberry Dry Forest.
Blind Ash Bay trail



Figure 3-23. RP – Red Pine/Blueberry Dry Forest. Dryweed Island – Rainy Lake



Figure 7-18. WP – White Pine/Mountain Mesic Maple Forest. Mature pine stand; north of Mica Bay



Figure P42a. WP – White Pine/Mountain Mesic Maple Forest. Veg plot #42; Kabetogama Peninsula Bay near Sucker Creek



Figure P110. BSF – Black Spruce/Feathermoss Forest. Kawawia Island – Rainy Lake



Figure 2-34. BSF - Black Spruce/Feathermoss Forest. Kawawia Island – Rainy Lake



Figure 2-16. BSF - Black Spruce/Feathermoss Forest. Recon #21; Saginaw Bay area - Rainy Lake



Figure 4-13. BSF - Black Spruce/Feathermoss Forest. Transition Zone between wetland & upland forests



Figure 2-31. BSF - Black Spruce/Feathermoss Forest. Kawawia Island – Rainy Lake



Figure 4-19. WCU – White Cedar-Boreal Conifer Mesic Forest. Recon #35; Near Cranberry Bay camp site



Figure 8-19. WCU – White Cedar-Boreal Conifer Mesic Forest. Small stand on side of hill; Junction Bay – Namakan Lake



Figure 8-21. WCU – White Cedar-Boreal Conifer Mesic Forest. Recon #47; Adjacent Johnson River – Junction Bay



Figure 8-20. WCU – White Cedar-Boreal Conifer Mesic Forest. Small Cedar stand as seen in Picture 8-19



Figure 5-18. BSB – Black Spruce Bog. Between Black Bay & Cranberry Bay



Figure 2-21. BSL – Black Spruce /Labrador Tea Poor Swamp (evergreen phase). Recon #32; dense forest canopy with sedge understory



Figure 6-6. BSL – Black Spruce/ Labrador Tea Poor Swamp (evergreen phase). Unique stand with Jack Pine as dominant .emergent tree



Figure 7-8. BSL – Black Spruce /Labrador Tea Poor Swamp (evergreen phase). Large peatland with Labrador Tea, sedges & sphagnum



Figure 6-7. BSL – Black Spruce /Labrador Tea Poor Swamp (evergreen phase). Labrador Tea & Sphagnum



Figure 8-16. BO – Northern Bur Oak Mesic Forest. Recon #46; Chief Wooden Frogs Islands - Kabetogama Lake



Figure P106. BO – Northern Bur Oak Mesic Forest. Veg plot #106; Moose Bay area – Namakan Lake

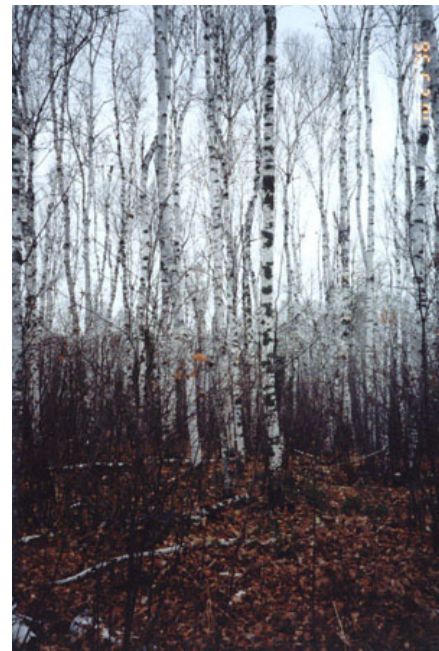


Figure 8-2. Recon # 43; Deer Point Islands - Kabetogama Lake



Figure 4-21. BA – Black Ash-Mixed Hardwood Swamp. Closed canopy forest; near Cranberry Bay camp



Figure 3-16. BA – Black Ash-Mixed Hardwood Swamp. Open canopy forest bordering a peatland



Figure 5-26. TA – Northern Tamarack Rich Swamp. Recon #37; with Labrador Tea, Sedges, & Sphagnum.



Figure 7-7. TA – Northern Tamarack Rich Swamp with Alder shrubs



Figure P58. SFA – Spruce-Fir-Aspen Forest. Veg plot #58; Kabetogama Peninsula near Cutover Island



Figure 6-13. SFA – Spruce-Fir-Aspen Forest (Alliance). White Spruce-Balsam Fir-Aspen Association. Along Cranberry Creek Portage Trail



Figure P100. WRPA – White Pine-Red Pine-Quaking Aspen-Birch Forest (Alliance). Veg plot #100; White Pine-Aspen-Birch Association



Figure P56. WRPA – White Pine-Red Pine-Quaking Aspen-Birch Forest (Alliance). Veg plot #56; White Pine-Aspen-Birch Association



Figure 1-21. WRPA – White Pine-Red Pine-
Quaking Aspen- Birch Forest (Alliance). Red Pine
-Aspen-Birch Association



Figure P186a WCA – White Cedar-Yellow Birch
Forest. Veg plot #186; inland SE of Daley Bay



Figure 7-24. WCBA – White
Cedar-Black Ash Swamp. Recon
#42; Round Bear Island



Figure 7-23. JPW – Boreal Pine Rocky Woodland
(jack pine phase)



Figure 4-6. JPW – Boreal Pine Rocky Woodland (jack pine phase). Shores of Saginaw Bay – Rainy Lake



Figure 4-7. JPW – Boreal Pine Rocky Woodland (jack pine phase). Inland west of Saginaw Bay - Rainy Lake



Figure 4-8. JPW – Boreal Pine Rocky Woodland (jack pine phase)



Figure 4-10. Recon #34; inland west of Saginaw Bay – Rainy Lake



Figure 5-35. JPW – Boreal Pine Rocky Woodland (jack pine phase). Recon #39; shores of Dryweed Island – Rainy Lake



Figure 8-1. ABW – Mixed Aspen Rocky Woodland Near Cruiser Lake Trailhead; Lost Bay – Kabetogama Lake



Figure P72. OW – Northern Pine Oak-Bur Oak-(Jack Pine) Rocky Woodland (deciduous phase). Vegetation plot #72



Figure 5-32. MPHW – Northern Pine Oak-Bur Oak-(Jack Pine) Rocky Woodland (mixed pine-oak phase). Recon #38; Dryweed Island



Figure 5-15. MPHW – Northern Pine Oak-Bur Oak-(Jack Pine) Rocky Woodland (mixed pine-oak phase). Dryweed Island



Figure 1-20. MPHW – Northern Pine Oak-Bur Oak-(Jack Pine) Rocky Woodland (mixed pine-oak phase). Recon #11; Dryweed Island



Figure 9-4. MPHW – Northern Pine Oak-Bur Oak-(Jack Pine) Rocky Woodland (mixed pine-oak phase); affected by blow-down



Figure P46. UBS – Boreal Hazelnut-Serviceberry Rocky Shrubland. Veg plot #46; Cutover Island



Figure P164a. AS – Speckled Alder Swamp. Veg plot #164; near Ash River Visitor Center



Figure P62. DS – Dogwood-Pussy Willow Swamp. Veg plot #62; Tom Cod Bay – Kabetogama Lake



Figure 7-14. DS – Dogwood-Pussy Willow Swamp; Black Bay



Figure 8-11. DS – Dogwood-Pussy Willow Swamp. Near recon #45; Irwin Bay – Kabetogama Lake



Figure 6-5. BBSF – Bo Birch-Willow Shore Fen; Black Bay



Figure 4-16. BBSF – Bo Birch-Willow Shore Fen; Cranberry Bay



Figure 2-24. LB – Leatherleaf Bog; near Brule Narrows – Rainy Lake



Figure 7-15. LB – Leatherleaf Bog; Black Bay area



Figure 6-23. LB – Leatherleaf Bog; south of Diamond Island – Rainy Lake



Figure 8-14. LB – Leatherleaf Bog; near Blind Ash Bay – Kabetogama Lake



Figure 3-9. LB – Leatherleaf Bog. Stereo view tail of large breached beaver impoundment



Figure 5-5. LB – Leatherleaf Bog. Floating mat within beaver impoundment; Hitchcock Bay area



Figure 5-3. LB – Leatherleaf Bog



Figure 4-24. Floating ericaceous mats within beaver impoundments; Hitchcock Bay area



Figure 3-13. LSF –Leatherleaf-Sweet Gale Shore Fen; Dryweed Island



Figure 6-17. LSF –Leatherleaf-Sweet Gale Shore Fen; Cranberry Creek near Locator Lake



Figure 4-20. SMX – Wet Meadow/Fen Mosaic/Complex; beaver impoundment with mix or wet meadow vegetation



Figure 6-14. SMX – Wet Meadow/Fen Mosaic/Complex. Cranberry Creek near Locator Lake



Figure 4-11. SMX – Wet Meadow/Fen Mosaic/Complex. Mix or wet meadow vegetation; inland west of Saginaw Bay



Figure 3-5. SMX – Wet Meadow/Fen Mosaic/Complex; stereo view of large breached beaver impoundment



Figure 3-8. SMX – Wet Meadow/Fen Mosaic/Complex; panoramic right view of large breached beaver impoundment



Figure 4-22. SMX – Wet Meadow/Fen Mosaic/Complex; beaver impoundment with standing dead



Figure 3-1. BJ – Canada Bluejoint Eastern Meadow. Recon #33; Big Island – Rainy Lake



Figure 4-25. BJ – Canada Bluejoint Eastern Meadow. Tail of beaver impoundment; Hitchcock Bay area – Rainy Lake



Figure 8-24. BJ – Canada Bluejoint Eastern Meadow. Johnson River near Junction Bay - Namakan Lake



Figure P78b. SMX - Wet Meadow/Fen Mosaic/Complex. Veg plot #78; Northern Sedge Wet Meadow Association



Figure 7-16. BM – Freshwater Bulrush Marsh. Wild Rice bordering; Skunk Island – Black Bay



Figure P64. CM – Midwest Cattail Deep Marsh. Large stand of cattail; Black Bay/Rat Root River



Figure 4-1. CM – Midwest Cattail Deep Marsh; Black Bay



Figure 4-4. CM – Midwest Cattail Deep Marsh. Beaver impoundment with cattail transitioning into SMX



Figure 9-8. WRM – Wild Rice Marsh; large stand of wild rice in Crane Lake



Figure 6-8. WRM – Wild Rice Marsh; uncommon Within beaver impoundments; Black Bay



Figure AA1036. SMX – Wet Meadow/Fen Mosaic /Complex. AA site #1306; Wiregrass Sedge Poor Fen Association



Figure AA1147b. DMX – Deep Marsh Mosaic/Complex. AA site #11147; Water Horsetail - Spikerush Marsh Association



Figure 7-2. DMX – Deep Marsh Mosaic/Complex; Stand of Spikerush



Figure P156a. WL – Northern Water Lily Aquatic Wetland. Veg plot #156; Moose Bay area - Namakan Lake



Figure 5-4 . WL – Northern Water Lily Aquatic Wetland; common within moats surrounding floating ericaceous mats



Figure P90. PW – Midwest Pondweed Submerged Aquatic Wetland. Veg plot #90; submergent vegetation



Figure 8-6. Recon #44; near Daley Bay



Figure P94a. JPL – Jack Pine/Lichen Rocky Barrens. Veg plot #94; inland east of Daley Bay



Figure 3-20. “Rockhop” Isle; Rainy Lake off of Dryweed Bay



Figure 4-18. Majestic White Pines



Figure 6-20. Near Cranberry Creek camp



Figure 6-10. Gold Portage



Figure 6-11. Up to the falls



Figure 3-2. The bear slide – washout beaver dam Breach; Lee Grim (VOYA) & Tom Owens (USGS).



Figure 8-25. Johnson Falls – Junction Bay



Figure 7-5. Schist geologic formation; rocky Shores of Big Island – Rainy Lake



Figure 7-4. Granite boulders; Big Island – Rainy Lake



Figure 5-34. Greenstone geologic formation; Dryweed Island – Rainy Lake



Figure 6-1. Old mine; Small Island – Rainy Lake

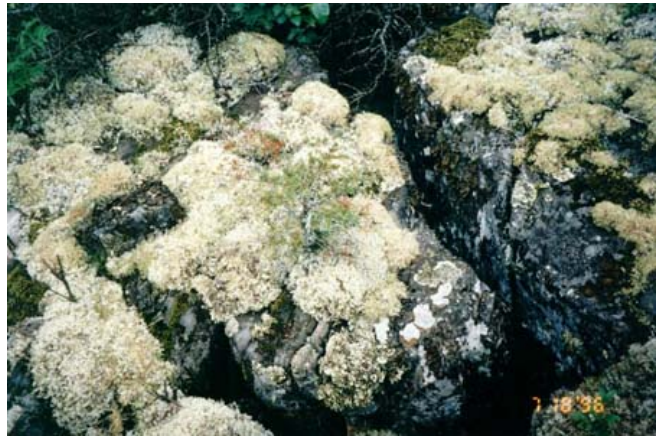


Figure 3-12. Moss & lichens on rocky outcrops.



Figure 5-7. Moss & lichens on rocky outcrops



Figure 5-2. Shallow root ball of white pine; Hitchcock Bay area



Figure 4-2. Beaver activity in the forest



Figure 5-6. Conks growing on the bark of Aspen



Figure 7-9. Hornet's nest



Figure 3-19. A spider's home



Figure 6-16. Garter snake finding sun



Figure 5-37. Rainy Lake Visitor Center boat launch



Figure 5-10. Boating in Hitchcock Bay



Figure 2-19. L-R: Michael Lew-Smith (Botanist), Kevin Hop (USGS), & Don Faber-Langendoen (TNC)



Figure 4-5. VOYA NP summer technicians with Ecologist Norm Aaseng (MN DNR) on far right



Figure 6-12. Photo interpreter Kevin Hop (USGS) photo reconnaissance



Figure 5-1. L-R: Jim Schaberl (VOYA NP), Norm Aaseng (MN DNR), Lee Grim (VOYA NP), and front: Michael Lew-Smith (Botanist)



Figure 3-24. Tom Owens – Geospatial Coordinator (USGS UMESC). Dryweed Island - Rainy Lake



Figure 3-18. Kevin Hop – Photo Interpreter (USGS UMESC). Dryweed Island - Rainy Lake



Figure 2-29. Sam Lammie - Geographer (VOYA NP)



Figure 7-1. Lee Grim (VOYA NP)



Figure 4-9. Joe Cayou (VOYA NP). Collecting GPS Coordinates



Figure 3-14. L-R : Jim Schaberl - Ecologist (VOYA NP) & Tom Owens (USGS)



Figure 7-19. Don Faber-Langendoen – Ecologist (TNC-Midwest)



Figure 5-23. Norman Aaseng - Ecologist (MN DNR)



Figure 5-21. Michael Lew-Smith - Botanist



Figure 6-25. Deb Pomroy-Petry – Botanist



Figure 7-13. Michael Lew-Smith (Botanist). Releve' work in the cattails



Figure 3-25. Jim Schaberl (VOYA NP). Blazing the trail



Figure 2-35. Lunch on the shores of Kempton Channel – Rainy Lake



Figure 2-26. Field reconnaissance in Red Pine Forest; Kawawia Island – Rainy Lake

Ground Photos of Interest



Figure 10-1. BSL – Black Spruce/Labrador Tea Poor Swamp (mixed phase)



Figure 10-2. CM – Midwest Cattail Deep Marsh



Figure 10-3. DS – Dogwood-Pussy Willow Swamp



Figure 10-4. DS – Dogwood-Pussy Willow Swamp



Figure 10-5. DS – Dogwood-Pussy Willow Swamp



Figure 10-6. LBC – Black Spruce/Leatherleaf Semi-treed Bog



Figure 10-7. LBC – Black Spruce/Leatherleaf Semi-treed Bog



Figure 10-8. MPHW - Northern Pin Oak-Bur Oak (Jack Pine) Rocky Woodland (mixed pine-oak phase)



Figure 10-9. MPHW - Northern Pin Oak-Bur Oak (Jack Pine) Rocky Woodland (mixed pine-oak phase)



Figure 10-10. SIT - Small island with trees



Figure 10-11. SMX - Wet Meadow/Fen Mosaic/Complex



Figure 10-12. SMX - Wet Meadow/Fen Mosaic/Complex



Figure 10-13. SMX - Wet Meadow/Fen Mosaic/Complex



Figure 10-14. SMX - Wet Meadow/Fen Mosaic/Complex



Figure 10-15. SMX - Wet Meadow/Fen Mosaic/Complex



Figure 10-16. WL – Northern Water Lily Aquatic Wetland



Figure 10-17. WLK - Lakes



Figure 11-1. Fieldwork; BJ – Canada Bluejoint Eastern Meadow



Figure 11-2. Fieldwork; BST – Black Spruce/
Labrador Tea Poor Swamp (mixed phase)



Figure 11-3. Fieldwork; BST – Black Spruce/
Labrador Tea Poor Swamp (mixed phase)



Figure 11-4. Fieldwork; JPF –
Jack Pine/Balsam Fir Forest

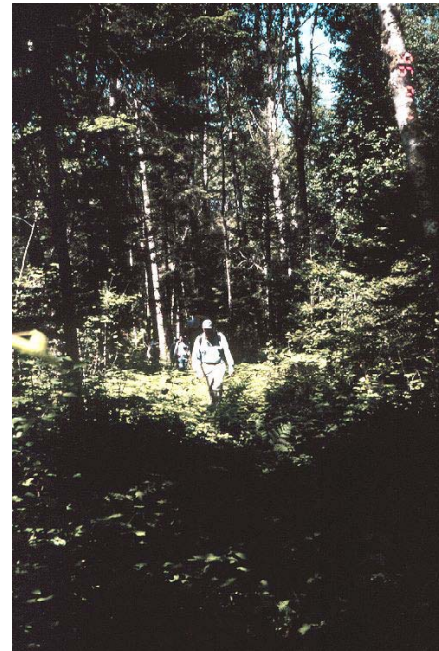


Figure 11-5. Fieldwork; SFA –
Spruce-Fir-Aspen Forest



Figure 11-6. Fieldwork; SMX - Wet Meadow/Fen
Mosaic/Complex



Figure 11-7. Fieldwork; SMX - Wet Meadow/Fen
Mosaic/Complex



Figure 11-8. Field crew



Figure 11-9. Sam Lammie

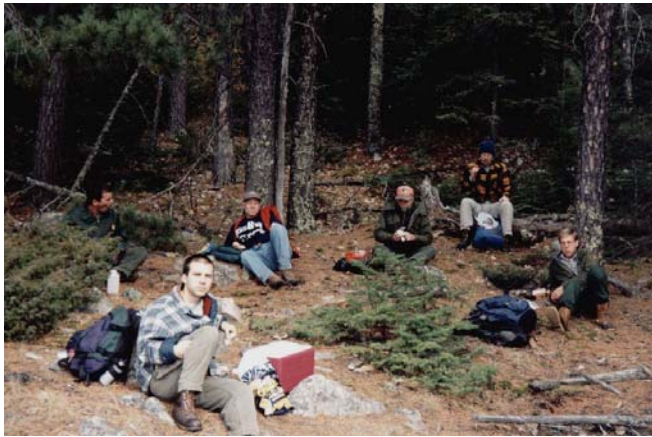


Figure 11-10. Field crew at lunch



Figure 11-11. Field crew at lunch



Figure 11-12. Dean Lundstrom



Figure 11-13. Field crew mapping discussion



Figure 11-14. Field crew mapping discussion



Figure 11-15. Field crew mapping discussion



Figure 11-16. Brule Island



Figure 11-17. Cranberry Bay



Figure 11-18. Boardwalk at Cruiser Lake picnic site



Figure 11-19. Gold Portage Creek, Black Bay



Figure 11-20. Heartlake; LB – Leatherleaf Bog



Figure 11-21. Icelake



Figure 11-22. Rat Root River peatland



Figure 11-23. Rocky shoreline of Big Island, Rainy Lake



Figure 11-24. Saginaw Bay; DMX – Deep Marsh Mosaic/Complex



Figure 11-25. Sunrise



Figure 11-26. Arrowhead



Figure 11-27. Bearberry



Figure 11-28. Fallen tree due to beaver activity and wind blow down



Figure 11-29. Burreed



Figure 11-30. Floating leaf Burreed



Figure 11-31. Moss & lichens on rock outcrop



Figure 11-32. Lichen on tree



Figure 11-33. Purple fringed orchid



Figure 11-34. Pitcher plant



Figure 11-35. Sundew



Figure 11-36. Camouflaged toad in tree stump



Figure 11-37. Deep within one of the finger-like bays of Marion Bay



Figure 11-38. Float plane ready to take off; Frank Bay



Figure 11-39. Float plane just rounding Soldier Point



Figure 11-40. Float plane awaiting boat crew; near Duckfoot Island



Figure 11-41. Float plane pilot Ron Hook prepares for passenger transfer



Figure 12-1. ABW – Mixed Aspen Rocky Woodland



Figure 12-2. AS – Speckled Alder Swamp



Figure 12-3. BBSF – Bog Birch-Willow Shore Fen



Figure 12-4. TF – Tamarack Scrub Poor Fen



Figure 12-5. BJ – Canada Bluejoint Eastern Meadow



Figure 12-6. BSF – Black Spruce/
Feathermoss Forest



Figure 12-7. DS – Dogwood-Pussy Willow Swamp



Figure 12-8. DMX – Deep Marsh Mosaic/Complex



Figure 12-9. JPAX – Jack Pine-Aspen Forest Mosaic



Figure 12-10. JPF – Jack Pine/
Balsam Fir Forest

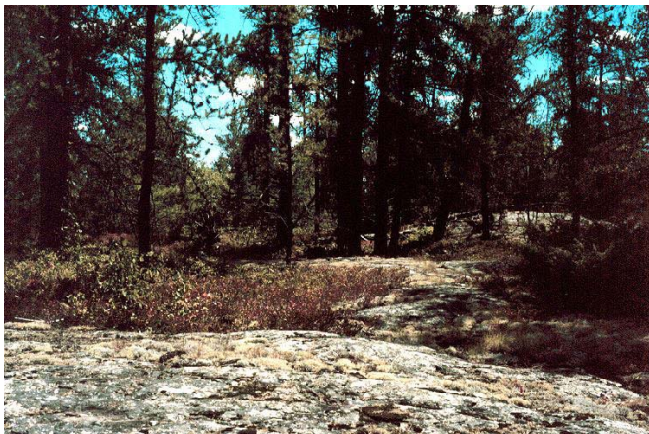


Figure 12-11. JPL – Jack Pine/Lichen Rocky
Barrens



Figure 12-12. LB – Leatherleaf Bog



Figure 12-13. LB – Leatherleaf Bog

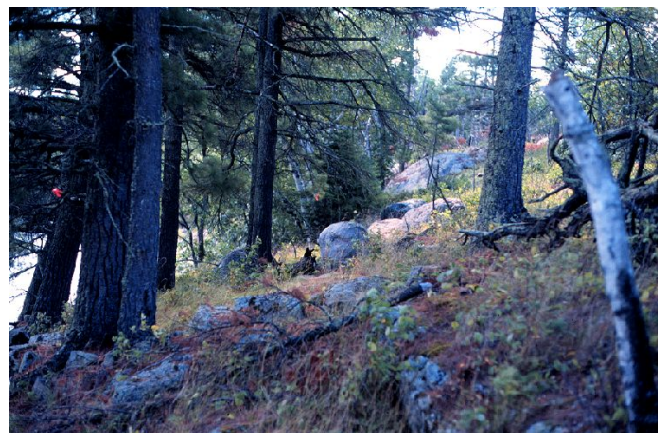


Figure 12-14. MPHW – Northern Pin Oak-Bur Oak-
(Jack Pine) Rocky Woodland (mixed pine-oak phase)



Figure 12-15. RP – Red Pine/Blueberry Dry Forest



Figure 12-16. RP – Red Pine/Blueberry Dry Forest



Figure 12-17. WRPA – White Pine-Red Pine-Quaking Aspen-Birch Forest



Figure 12-18. SMX – Wet Meadow/Fen Mosaic/Complex



Figure 12-19. SMX – Wet Meadow/Fen Mosaic/Complex



Figure 12-20. SMX – Wet Meadow/Fen Mosaic/Complex



Figure 12-21. SMX – Wet Meadow/Fen Mosaic/Complex



Figure 12-22. TA - Northern Tamarack Rich Swamp

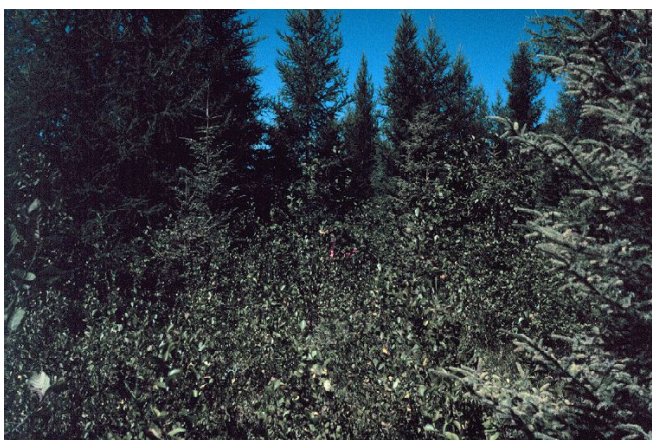


Figure 12-23. TA - Northern Tamarack Rich Swamp



Figure 12-24. TF – Tamarack Scrub Poor Fen



Figure 12-25. WCBA – White Cedar-Black Ash Swamp



Figure 12-26. WCS - White Cedar-(Mixed Conifer)/Alder Swamp (rich soil phase)



Figure 12-27. WCS - White Cedar-(Mixed Conifer)/Alder Swamp (rich soil phase)



Figure 12-28. WL – Northern Water Lily Aquatic Wetland