# MANITOBA ENVIROTHON
# NATIVE PLANTS AND FORESTRY

| Outcome Cluster | Code | Manitoba Envirothon Outcomes |
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| Native Plants and Forests as Resources | F1 | Describe the ecological, economic and social benefits of native plants, horticultural trees and forests. |
| | F2 | Describe the ecosystem services provided by native plants, horticultural trees and forests |
| | F3 | List timber and non-timber products provided by trees and forests. |
| | F4 | Give examples of how native plants have been used traditionally. |
| | F5 | Describe factors affecting health and survival of native plants, horticultural trees and forests, including biodiversity, non-native species, habitat reduction, pollution, climate change, fire and human activity. |
| Plant Biology and Plant Identification | F6 | Describe the annual growth cycle of a tree. |
| | F7 | Explain how photosynthesis and respiration are important to the growth and reproduction of plants. |
| | F8 | Name the structures and tissues of plants. |
| | F9 | Describe the functions of parts and tissues of plants. |
| | F10 | Give examples of adaptions of plants to their environments, including boggy soil, steep slopes, rocky terrain and extreme climate. |
| | F11 | Identify the common trees and shrubs of Manitoba by common name without a key. |
| | F12 | Name Manitoba's provincial tree and flower. |
| | F13 | Identify other trees and shrubs by scientific and common names using a key or field guide. |
| | F14 | Identify distinctive indicator plant species using a key. |
| | F15 | Identify distinctive plant species at risk without a key. |
| | F16 | Identify common invasive forest pests present or anticipated in Manitoba |

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| Forest Ecology | F17 | Describe typical forest structure, including canopy, understory and ground layers, and crown classes. |
| | F18 | Discuss the relationship between soil and forest type. |
| | F19 | Describe the effects of succession in forest ecosystems. |
| | F20 | Discuss the role of fire in forest ecosystems. |
| | F21 | Explain why snags and fallen trees are important to forest ecosystems. |
| | F22 | Describe the effect of competition in forest ecosystems. |
| | F23 | Recognize indicators of health and age in a forest. |
| | F24 | Explain why biodiversity in forest ecosystems is important to forest health. |
| | F25 | List abiotic and biotic factors in a forest ecosystem. |
| | F26 | Explain how abiotic and biotic factors including climate, insects, microorganisms and wildlife affect forests, |
| | F27 | List the eco-regions of Manitoba. |
| | F28 | Describe the eco-regions of Manitoba including their geographical location. |
| | F29 | Name the dominant tree species and key indicator species associated with each eco-region. |
| | F30 | Name plant species that are at risk in Manitoba. |
| | F31 | Give examples of invasive forest pests present or anticipated in Manitoba. |
| Silviculture and Forest Management | F32 | Discuss the relationship between sustainable development and forest management. |
| | F33 | Explain why forest management is important in addressing issues such as conservation of biodiversity, non-native species habitat reduction, pollution, climate change, fire and aesthetics. |
| | F34 | Describe the role of government in forest management, |
| | F35 | Describe forest certification including its components. |
| | F36 | Name the forest certification systems in use in North America, including CSA, FSC, and SFI. |

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| | F37 | Explain why certification of sustainable management forests is important to Canada's forest industry. |
| | F38 | Describe the status of forests and forestry in Manitoba and Canada. |
| | F39 | Describe threats to forest resources in Manitoba and Canada. |
| | F40 | Describe sustainable forestry management. |
| | F41 | Give examples of Traditional Ecological Knowledge (TEK). |
| | F42 | Explain the role TEK plays in sustainable forest management. |
| | F43 | Describe BMPs (best/better management practices) for forestry, including those for riparian zones, water quality, fire and aesthetics. |
| | F44 | Describe management practices used in urban forestry. |
| | F45 | Describe the uses of forest surveys, including silviculture surveys, inventories, wood supply analysis and pre-harvest surveys. |
| | F46 | Describe silviculture practices for planting, tending and harvesting. |
| | F47 | Explain how silviculture practices are used, including tree improvement, seedling production, weeding, herbiciding, thinning, burning, even-aged and uneven-aged stands, selection, clearcutting, seed-tree and shelter wood. |
| | F48 | Describe practices for managing forest health including insect and disease control. |
| | F49 | Determine general goals and practices for a particular forestry situation based on principles and methods of sustainable forest management. |
| | F50 | Identify basic forestry tools, including calipers, increment borer, clinometers, prism, compass, diameter tape and tables. |
| | F51 | Describe how to use basic forestry tools. |
| | F52 | Measure dimensions of trees, including DBH and height. |
| | F53 | Determine tree volume and board feet using tables. |
| | F54 | Determine tree age from a tree cookie or core. |
| | F55 | Describe methods and procedures used in a forest survey, including PSPs/TSPs, mapping and sampling. |
| | F56 | Describe how Global Information Systems (GIS) are used in forest management. |