

Key Topics	Learning Objectives	Learning Materials (LO Alignment)	Optional/Supplemental Materials
KT 1: Forest Ecology <i>HS-LS1-2, HS-LS1-5, HS-LS1-7, HS-LS2-1, HS-LS2-3, HS-LS2-5, HS-ESS2-5, HS-ESS2-6</i>	LO 1.1: List the biotic and abiotic components of a forest ecosystem. LO 1.2: Explain the structure of a forest ecosystem and identify different crown classes. LO 1.3: Diagram the energy flow in a forest ecosystem and describe the relationships between trophic levels. LO 1.4: Describe the role that plant communities play in nutrient cycling, including carbon, nitrogen, and phosphorus cycles. LO 1.5: Describe how plant communities provide important habitat types for wildlife. LO 1.6: Identify how wildlife can impact a forest ecosystem both positively and negatively.	Chapter Two: Forest Ecosystems (LO 1.1-1.3) 5.2 Crown Classes (LO 1.2) Biogeochemical Cycles (LO 1.4) 4 Elements of a Healthy Forest (LO 1.5) Forest Stewardship: Wildlife (LO 1.5-1.6)	
KT 2: Fire Ecology <i>HS-LS2-6</i>	LO 2.1: Describe the role of fire in ecosystems (including fire-dependent and non-fire-dependent systems) LO 2.2: List the benefits of snags and downed logs to wildlife species LO 2.3: Identify stages of plant succession within the context of a given ecosystem. LO 2.4: Identify adaptive features of plants and animals that have evolved in response to fire.	Wildland Fire in Ecosystems (LO 2.1) Wildlife Habitat as it Relates to Forestry (LO 2.2) The Benefits of Downed Wood (LO 2.2) Chapter Two: Forest Ecosystems (LO 2.3) Chapter Introduction: Fire Ecology (LO 2.4)	
KT 3: Field Skills	LO 3.1: Identify common local trees and plants by leaves, bark, branching patterns, buds, fruit, and other characteristics. LO 3.2: Use common forestry tools, such as a Biltmore Stick, Merritt Hypsometer, D-tape, Wedge Prism, Tree Caliper, Clinometer, Increment Borer, GPS, Topographic Maps, etc. LO 3.3: Identify common plant pests and diseases LO 3.4: Produce common forestry measurements, such as diameter at breast height (DBH), chain, cord, total tree height, merchantable height, board feet, log, and basal area.	New Mexico FFA Tree Identification Study Guide (LO 3.1) Dendrochronology: How to Use an Increment Borer (LO 3.2) FFA Forestry CDE Handbook (LO 3.2) How to Read a Topo Map (LO 3.2) How to Use a Clinometer (LO 3.2) How to Use Diameter Tape (LO 3.2) Measuring Tree Height with a Merritt Hypsometer (LO 3.2) Measuring Tree Volume with a Biltmore Stick (LO 3.2) Using a Prism to Measure Basal Area (LO 3.2) Field Guide to Insects and Diseases of Arizona and New Mexico Forests (LO 3.3) Basal Area: A Measure Made for Management (LO 3.4) Measuring Standing Trees (LO 3.4)	
KT 4: Forest Management <i>HS-LS2-5, HS-LS2-7, HS-LS4-6, HS-ESS2-5, HS-ESS3-4</i>	LO 4.1: Explain how forested ecosystems benefit water quality LO 4.2: Describe the role that plant communities play in the water cycle, including major events such as flooding, droughts, and storms LO 4.3: Explain the concept of Best Management Practices (BMPs) in forestry and list examples. LO 4.4: Make management recommendations based on ecological conditions of the forest and management goals (such as wildlife habitat, timber production, recreation, et cetera). LO 4.5: Describe human uses for forest and plant products and how these products are obtained from natural resources.	NM Envirothon Forestry Resource: Watersheds (LO 4.1-4.3) Evapotranspiration and the Water Cycle (LO 4.2) What Do Plants Have to Do with Flooding? (LO 4.2) Forest Management Basics (LO 4.4) Forest Management Video (LO 4.4) Forest Products (LO 4.5) Idaho Forest Products Video Series (LO 4.5) Why Forests are Important for People (LO 4.5)	