

MANITOBA ENVIROTHON WILDLIFE AND WILDLIFE MANAGEMENT

Outcome Cluster	Code	Manitoba Envirothon Outcomes
Wildlife as a Resource	W1	Describe the ecological, economic and social benefits of wildlife.
	W2	Explain the importance of the three components of biodiversity to wildlife and to humans.
	W2a	Give examples of how wildlife has been used traditionally.
	W3	Describe factors affecting wildlife and wildlife habitat, including biodiversity, non-native species, habitat reduction, pollution, climate change and human activity.
Animal Biology and Animal Identification	W4	Identify basic features of external and internal anatomy of birds and mammals.
	W5	List the components of the main organ systems of animals.
	W6	Describe the functions of the main organ systems of animals.
	W7	Give examples of anatomical, physiological and/or behavioral adaptations of common wildlife.
	W8	Determine an animal's general diet, habitat, and daily activity pattern from its gross anatomy.
	W9	Determine dental formula from a skull.
	W10	Determine major mammal and bird groups from skulls without a key.
	W11	Identify common mammal, bird and herp species from recordings of animal sounds without a key.
	W12	Name Manitoba's provincial mammal and bird.
	W13	Identify common bird, mammal and herp species using a field guide or key from specimens, dental formulae, pictures, decoys, scats or tracks.
	W14	Describe key characteristics of common animal phyla.
W15	Identify common invasive species that affect wildlife present or anticipated in Manitoba.	
Wildlife	W16	Describe the impact of succession on wildlife.

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Ecology	W17	Describe a food web, including interactions between organisms and energy flow in the web.
	W18	Give examples of wildlife species at different trophic levels.
	W19	Describe the role of a particular species in the ecosystem.
	W20	Describe relationships of organisms in an ecosystem, including predation, competition and different types of symbiosis.
	W21	Give examples of types of symbiosis.
	W22	Give examples of pathogens and parasites found in Manitoba wildlife.
	W23	Explain how abiotic and biotic factors affect an animal's ability to obtain resources.
	W24	Explain how specific adaptations contribute to the survival of wildlife species.
	W25	Describe the five main habitat needs of all wildlife.
	W26	Describe the specific needs and preferred habitat of common wildlife species in Manitoba.
	W27	Explain how carrying capacity affects wildlife populations.
	W28	Give examples of limiting factors for wildlife populations.
	W29	Describe how birth, mortality, age structure, sex ratio, and mating systems affect wildlife populations.
	W30	Name wildlife species that are at risk in Manitoba and Canada.
	W31	List factors that contribute to the status of species at risk.
	W32	Describe common characteristics of at risk species that contribute to their status.
	W33	Give examples of common invasive species that affect wildlife present or anticipated in Manitoba.
W34	Describe characteristics of invasive species that contribute to their success over native species.	
Conservation and	W35	Discuss the relationship between sustainable development and wildlife management.

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Management of Wildlife	W36	Explain the importance of wildlife management in addressing issues such as conservation of biodiversity, non-native species, habitat reduction, pollution, climate change and human activity.
	W37	Describe role of government and wildlife managers in conserving and managing wildlife and wildlife habitat, including planning, regulation, education and enforcement.
	W38	Describe the role of laws in conserving species at risk.
	W39	Differentiate between the main categories for species at risk.
	W40	Name organizations and agencies responsible for listing and protecting species at risk at the provincial, federal and international level.
	W41	Explain how the IUCN Red List of Threatened Species is used.
	W42	Describe information and approaches that wildlife managers use to create management goals.
	W43	Describe common practices and methods for managing wildlife and wildlife habitat, including population control, hunting and trapping regulations and habitat restoration.
	W44	Describe strategies used to manage issues involving wildlife in Manitoba, including non-native species, problem wildlife, wildlife pathogens and disease, and species at risk.
	W45	Give examples of species that are considered problem wildlife.
	W46	Evaluate habitats for a particular species according to its specific requirements.
	W47	Calculate populations using quadratic sampling and mark recapture.
	W48	Describe common research methods used by wildlife biologists, including population monitoring, diet reconstruction and ethology.
	W49	Describe how Global Information Systems (GIS) are used in wildlife management.
	W50	Describe how to perform research methods used by wildlife biologists, including sampling methods and field journals.
W51	Determine appropriate method for a particular research study.	