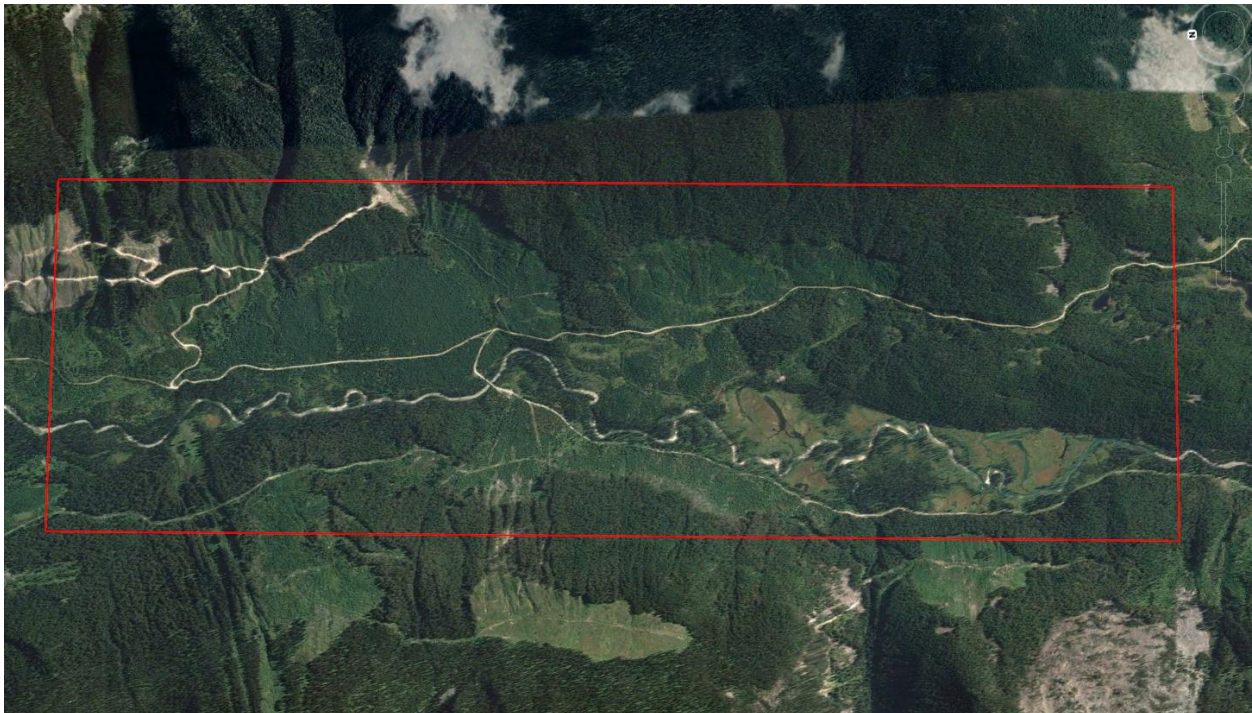


## Comparing Before and After Condition: A Forest Example

**Note:** The WildlifeDiversity program provides a list of species within an area along with other information. However, there is more that can be done other than simple lists of species. As an example, the tables below were created by taking two separate program results and combining them using a spreadsheet in order to compare the same forest area prior to and after timber harvesting. WildlifeDiversity does not itself directly combine this information. The other items below (the map and explanation of the tables) are only provided for illustration purposes. Also, this analysis does not involve inventory or validation in the field. All values are derived from general, continent-wide species and habitat associations, average population densities and knowledge of wildlife food habits.

The forested area, as outlined in red below after a large percentage was clear-cut harvested, was originally old growth coniferous forest of 900 hectares with a fast-moving stream and wetland areas of 77 hectares. Due to the old growth condition, it was assumed to have considerable forest features such as down woody debris, existing nests, large trees, tree cavities and snags. After 36% of the forest was harvested, the cut areas were cleared of all these features, making them unavailable to species that typically require them.

The area was stratified into 47 habitat types. The WildlifeDiversity program was run twice to account for pre-harvest and post-harvest condition of the forest. Lists of potential vertebrate species and typical food items that supports them were then derived as listed in the two tables below.



Predicted species and estimated population numbers, sorted by most abundant to least abundant for the pre-harvest case, are presented in the first table below. Out of a total of 239 species that have this area within their known range distribution, 81 found some habitat that met their habitat needs (number was not zero).

An old general rule of thumb is that at least 50 individuals are needed to have a viable population over the short term, and at least 500 individuals to have a successful long-term survival of a species. The actual numbers vary greatly between species and habitats. Of course, this only applies if the area is isolated from similar habitats. If there are similar adjacent habitats, then the viability for a species to survive increases by the amount of continuous or nearby suitable habitats that are available. This would mean that this example area, if analyzed as an isolated “island”, would have only been able to support 27 species in the short-term and 11 species in the long-term in the pre-cut, largely old growth condition. The post-cut would be able to support 21 species in the short-term and 12 species in the long-term, but with a shift in the species community make-up.

As seen, there is a tendency for species typically found in old growth forest, such as the Golden-crowned Kinglet or Northern Flying Squirrel, to decline in number after clear-cutting while the new conditions of a young, open forest make it possible for pioneer species, such as the Clay-colored Sparrow or Dark-eyed Junco to colonize or increase in number.

Note that there is a **Type** column so you can easily separate or sort by major invertebrate group of Bird, Mammal, Frog, Salamander, Lizard, Snake or Turtle once the information is imported into a spreadsheet.

### **Predicted Vertebrate Species and Number (Pre- and Post-Harvest Comparison)**

Scientific Name	Common Name	Type	Pre-harvest Number	Post-harvest Number	Change in Number
<i>Peromyscus maniculatus</i>	Deer Mouse	Mammal	27468.0	27468.0	0.0
<i>Microtus pennsylvanicus</i>	Meadow Vole	Mammal	13680.0	13680.0	0.0
<i>Sorex cinereus</i>	Cinereus Shrew	Mammal	5936.5	5936.5	0.0
<i>Regulus satrapa</i>	Golden-crowned Kinglet	Bird	3497.1	2320.9	-1176.2
<i>Myodes gapperi</i>	Southern Red-backed Vole	Mammal	1427.6	1165.8	-261.8
<i>Tamiasciurus hudsonicus</i>	Red Squirrel	Mammal	1210.5	803.4	-407.2
<i>Glaucomys sabrinus</i>	Northern Flying Squirrel	Mammal	1131.7	726.0	-405.7
<i>Sorex hoyi</i>	American Pygmy Shrew	Mammal	853.8	853.8	0.0
<i>Anaxyrus boreas</i>	Western toad	Frog	843.9	1463.6	619.7
<i>Empidonax difficilis</i>	Pacific-slope Flycatcher	Bird	604.9	393.8	-211.1
<i>Sitta canadensis</i>	Red-breasted Nuthatch	Bird	528.2	347.3	-181.0
<i>Junco hyemalis</i>	Dark-eyed Junco	Bird	379.1	722.9	343.8
<i>Selasphorus rufus</i>	Rufous Hummingbird	Bird	292.3	195.7	-96.5
<i>Certhia americana</i>	Brown Creeper	Bird	287.8	182.2	-105.6

<i>Regulus calendula</i>	Ruby-crowned Kinglet	Bird	242.6	157.5	-85.1
<i>Vermivora celata</i>	Orange-crowned Warbler	Bird	202.2	202.2	0.0
<i>Coccothraustes vespertinus</i>	Evening Grosbeak	Bird	186.9	126.1	-60.8
<i>Catharus guttatus</i>	Hermit Thrush	Bird	173.3	112.5	-60.8
<i>Dendroica coronata</i>	Yellow-rumped Warbler	Bird	145.0	137.5	-7.5
<i>Phenacomys intermedius</i>	Western Heather Vole	Mammal	111.3	111.3	0.0
<i>Picoides dorsalis</i>	American Three-toed Woodpecker	Bird	104.5	47.6	-56.9
<i>Mustela nivalis</i>	Least Weasel	Mammal	97.7	169.4	71.7
<i>Poecile gambeli</i>	Mountain Chickadee	Bird	95.7	60.2	-35.6
<i>Myotis volans</i>	Long-legged Myotis	Mammal	89.9	59.5	-30.4
<i>Empidonax hammondii</i>	Hammond's Flycatcher	Bird	70.6	70.6	0.0
<i>Ambystoma macrodactylum</i>	Long-toed salamander	Salamander	68.9	68.9	0.0
<i>Cyanocitta stelleri</i>	Steller's Jay	Bird	53.3	35.0	-18.2
<i>Geothlypis trichas</i>	Common Yellowthroat	Bird	44.7	319.1	274.5
<i>Aegolius acadicus</i>	Northern Saw-whet Owl	Bird	35.2	23.2	-12.1
<i>Loxia curvirostra</i>	Red Crossbill	Bird	29.9	28.6	-1.4
<i>Spizella arborea</i>	American Tree Sparrow	Bird	27.1	27.1	0.0
<i>Piranga ludoviciana</i>	Western Tanager	Bird	24.1	173.0	148.9
<i>Bombycilla cedrorum</i>	Cedar Waxwing	Bird	22.3	22.3	0.0
<i>Empidonax oberholseri</i>	Dusky Flycatcher	Bird	20.7	243.9	223.2
<i>Contopus sordidulus</i>	Western Wood-Pewee	Bird	20.4	14.4	-6.0
<i>Lagopus lagopus</i>	Willow Ptarmigan	Bird	17.8	17.8	0.0
<i>Corvus brachyrhynchos</i>	American Crow	Bird	17.8	17.8	0.0
<i>Mustela erminea</i>	Ermine	Mammal	17.7	25.5	7.8
<i>Colaptes auratus</i>	Northern Flicker	Bird	14.6	14.6	0.0
<i>Aythya collaris</i>	Ring-necked Duck	Bird	11.5	11.5	0.0
<i>Martes americana</i>	American Marten	Mammal	10.4	6.8	-3.6
<i>Loxia leucoptera</i>	White-winged Crossbill	Bird	9.0	6.0	-3.0
<i>Carduelis pinus</i>	Pine Siskin	Bird	8.9	8.9	0.0
<i>Dryocopus pileatus</i>	Pileated Woodpecker	Bird	7.9	5.2	-2.7
<i>Turdus migratorius</i>	American Robin	Bird	7.8	61.0	53.2
<i>Falci pennis canadensis</i>	Spruce Grouse	Bird	7.1	7.1	0.0
<i>Sturnus vulgaris</i>	European Starling	Bird	5.9	5.9	0.0
<i>Contopus cooperi</i>	Olive-sided Flycatcher	Bird	5.8	5.8	0.0
<i>Odocoileus hemionus</i>	Mule Deer	Mammal	5.8	5.8	0.0
<i>Strix nebulosa</i>	Great Gray Owl	Bird	5.3	3.5	-1.8
<i>Strix varia</i>	Barred Owl	Bird	5.0	3.2	-1.8
<i>Carpodacus purpureus</i>	Purple Finch	Bird	4.8	4.8	0.0
<i>Mustela frenata</i>	Long-tailed Weasel	Mammal	4.2	4.2	0.0
<i>Pinicola enucleator</i>	Pine Grosbeak	Bird	3.6	3.6	0.0
<i>Aegolius funereus</i>	Boreal Owl	Bird	3.2	2.1	-1.1
<i>Ixoreus naevius</i>	Varied Thrush	Bird	3.1	1.4	-1.7

<i>Poecile hudsonica</i>	Boreal Chickadee	Bird	2.8	2.8	0.0
<i>Melospiza lincolni</i>	Lincoln's Sparrow	Bird	2.2	2.2	0.0
<i>Perisoreus canadensis</i>	Gray Jay	Bird	2.2	2.2	0.0
<i>Corvus corax</i>	Common Raven	Bird	2.2	5.0	2.9
<i>Chaetura vauxi</i>	Vaux's Swift	Bird	2.0	1.9	-0.1
<i>Melanitta fusca</i>	White-winged Scoter	Bird	1.6	1.6	0.0
<i>Myotis californicus</i>	Californian Myotis	Mammal	1.1	1.1	-0.1
<i>Glaucidium gnoma</i>	Northern Pygmy-Owl	Bird	0.9	0.6	-0.3
<i>Sialia currucoides</i>	Mountain Bluebird	Bird	0.9	0.9	0.0
<i>Anas platyrhynchos</i>	Mallard	Bird	0.8	0.8	0.0
<i>Erethizon dorsatum</i>	North American Porcupine	Mammal	0.6	3.7	3.0
<i>Vireo cassinii</i>	Cassin's Vireo	Bird	0.5	0.5	0.0
<i>Martes pennanti</i>	Fisher	Mammal	0.5	0.4	0.0
<i>Synaptomys borealis</i>	Northern Bog Lemming	Mammal	0.4	0.4	-0.1
<i>Molothrus ater</i>	Brown-headed Cowbird	Bird	0.3	17.0	16.7
<i>Accipiter gentilis</i>	Northern Goshawk	Bird	0.2	0.1	-0.1
<i>Rangifer tarandus</i>	Caribou	Mammal	0.1	0.1	-0.1
<i>Eptesicus fuscus</i>	Big Brown Bat	Mammal	0.1	0.1	0.0
<i>Myotis evotis</i>	Long-eared Myotis	Mammal	0.1	0.1	0.0
<i>Accipiter striatus</i>	Sharp-shinned Hawk	Bird	0.1	0.1	0.0
<i>Gulo gulo</i>	Wolverine	Mammal	0.1	0.1	0.0
<i>Histrionicus histrionicus</i>	Harlequin Duck	Bird	0.1	0.1	0.0
<i>Puma concolor</i>	Cougar	Mammal	0.1	0.1	0.0
<i>Lontra canadensis</i>	Northern River otter	Mammal	0.1	0.1	0.0
<i>Falco columbarius</i>	Merlin	Bird	0.1	0.1	0.0
<i>Surnia ulula</i>	Northern Hawk Owl	Bird	0.0	0.0	0.0
<i>Anas crecca</i>	Green-winged Teal	Bird	0.0	0.0	0.0
<i>Marmota caligata</i>	Hoary marmot	Mammal	0.0	0.0	0.0
<i>Canis lupus</i>	Gray Wolf	Mammal	0.0	0.1	0.1
<i>Buteo jamaicensis</i>	Red-tailed Hawk	Bird	0.0	0.0	0.0
<i>Anas acuta</i>	Northern Pintail	Bird	0.0	0.0	0.0
<i>Anas americana</i>	American Wigeon	Bird	0.0	0.0	0.0
<i>Anas clypeata</i>	Northern Shoveler	Bird	0.0	0.0	0.0
<i>Anas discors</i>	Blue-winged Teal	Bird	0.0	0.0	0.0
<i>Aythya affinis</i>	Lesser Scaup	Bird	0.0	0.0	0.0
<i>Aythya valisineria</i>	Canvasback	Bird	0.0	0.0	0.0
<i>Branta canadensis</i>	Canada Goose	Bird	0.0	0.0	0.0
<i>Bucephala albeola</i>	Bufflehead	Bird	0.0	0.0	0.0
<i>Bucephala clangula</i>	Common Goldeneye	Bird	0.0	0.0	0.0
<i>Bucephala islandica</i>	Barrow's Goldeneye	Bird	0.0	0.0	0.0
<i>Lophodytes cucullatus</i>	Hooded Merganser	Bird	0.0	0.0	0.0
<i>Melanitta perspicillata</i>	Surf Scoter	Bird	0.0	0.0	0.0
<i>Mergus merganser</i>	Common Merganser	Bird	0.0	0.0	0.0

<i>Mergus serrator</i>	Red-breasted Merganser	Bird	0.0	0.0	0.0
<i>Oxyura jamaicensis</i>	Ruddy Duck	Bird	0.0	0.0	0.0
<i>Ardea herodias</i>	Great Blue Heron	Bird	0.0	0.0	0.0
<i>Botaurus lentiginosus</i>	American Bittern	Bird	0.0	0.0	0.0
<i>Gavia immer</i>	Common Loon	Bird	0.0	0.0	0.0
<i>Bonasa umbellus</i>	Ruffed Grouse	Bird	0.0	0.0	0.0
<i>Dendragapus obscurus</i>	Dusky Grouse	Bird	0.0	0.0	0.0
<i>Lagopus leucura</i>	White-tailed Ptarmigan	Bird	0.0	0.0	0.0
<i>Phasianus colchicus</i>	Ring-necked Pheasant	Bird	0.0	0.0	0.0
<i>Tympanuchus phasianellus</i>	Sharp-tailed Grouse	Bird	0.0	0.0	0.0
<i>Aechmophorus occidentalis</i>	Western Grebe	Bird	0.0	0.0	0.0
<i>Podiceps auritus</i>	Horned Grebe	Bird	0.0	0.0	0.0
<i>Podiceps grisegena</i>	Red-necked Grebe	Bird	0.0	0.0	0.0
<i>Podiceps nigricollis</i>	Eared Grebe	Bird	0.0	0.0	0.0
<i>Accipiter cooperii</i>	Cooper's Hawk	Bird	0.0	0.0	0.0
<i>Aquila chrysaetos</i>	Golden Eagle	Bird	0.0	0.0	0.0
<i>Buteo swainsoni</i>	Swainson's Hawk	Bird	0.0	0.0	0.0
<i>Circus cyaneus</i>	Northern Harrier	Bird	0.0	0.0	0.0
<i>Haliaeetus leucocephalus</i>	Bald Eagle	Bird	0.0	0.0	0.0
<i>Pandion haliaetus</i>	Osprey	Bird	0.0	0.0	0.0
<i>Falco rusticolus</i>	Gyrfalcon	Bird	0.0	0.0	0.0
<i>Falco sparverius</i>	American Kestrel	Bird	0.0	0.0	0.0
<i>Grus canadensis</i>	Sandhill Crane	Bird	0.0	0.0	0.0
<i>Fulica americana</i>	American Coot	Bird	0.0	0.0	0.0
<i>Porzana carolina</i>	Sora	Bird	0.0	0.0	0.0
<i>Charadrius semipalmatus</i>	Semipalmated Plover	Bird	0.0	0.0	0.0
<i>Charadrius vociferus</i>	Killdeer	Bird	0.0	0.0	0.0
<i>Larus argentatus</i>	Herring Gull	Bird	0.0	0.0	0.0
<i>Larus californicus</i>	California Gull	Bird	0.0	0.0	0.0
<i>Larus canus</i>	Mew Gull	Bird	0.0	0.0	0.0
<i>Larus delawarensis</i>	Ring-billed Gull	Bird	0.0	0.0	0.0
<i>Larus philadelphia</i>	Bonaparte's Gull	Bird	0.0	0.0	0.0
<i>Sterna hirundo</i>	Common Tern	Bird	0.0	0.0	0.0
<i>Actitis macularius</i>	Spotted Sandpiper	Bird	0.0	0.0	0.0
<i>Calidris alpina</i>	Dunlin	Bird	0.0	0.0	0.0
<i>Calidris minutilla</i>	Least Sandpiper	Bird	0.0	0.0	0.0
<i>Gallinago delicata</i>	Wilson's Snipe	Bird	0.0	0.0	0.0
<i>Limnodromus scolopaceus</i>	Long-billed Dowitcher	Bird	0.0	0.0	0.0
<i>Phalaropus tricolor</i>	Wilson's Phalarope	Bird	0.0	0.0	0.0
<i>Tringa flavipes</i>	Lesser Yellowlegs	Bird	0.0	0.0	0.0
<i>Tringa melanoleuca</i>	Greater Yellowlegs	Bird	0.0	0.0	0.0
<i>Tringa solitaria</i>	Solitary Sandpiper	Bird	0.0	0.0	0.0
<i>Ceryle alcyon</i>	Belted Kingfisher	Bird	0.0	0.0	0.0

<i>Chordeiles minor</i>	Common Nighthawk	Bird	0.0	16.9	16.9
<i>Melanerpes lewis</i>	Lewis's Woodpecker	Bird	0.0	0.0	0.0
<i>Picoides arcticus</i>	Black-backed Woodpecker	Bird	0.0	0.0	0.0
<i>Picoides pubescens</i>	Downy Woodpecker	Bird	0.0	0.0	0.0
<i>Picoides villosus</i>	Hairy Woodpecker	Bird	0.0	0.0	0.0
<i>Sphyrapicus nuchalis</i>	Red-naped Sapsucker	Bird	0.0	0.0	0.0
<i>Asio flammeus</i>	Short-eared Owl	Bird	0.0	0.0	0.0
<i>Asio otus</i>	Long-eared Owl	Bird	0.0	0.0	0.0
<i>Bubo virginianus</i>	Great Horned Owl	Bird	0.0	0.0	0.0
<i>Stellula calliope</i>	Calliope Hummingbird	Bird	0.0	0.0	0.0
<i>Empidonax minimus</i>	Least Flycatcher	Bird	0.0	0.0	0.0
<i>Empidonax occidentalis</i>	Cordilleran Flycatcher	Bird	0.0	0.0	0.0
<i>Empidonax traillii</i>	Willow Flycatcher	Bird	0.0	0.0	0.0
<i>Tyrannus tyrannus</i>	Eastern Kingbird	Bird	0.0	0.0	0.0
<i>Tyrannus verticalis</i>	Western Kingbird	Bird	0.0	0.0	0.0
<i>Eremophila alpestris</i>	Horned Lark	Bird	0.0	0.0	0.0
<i>Bombycilla garrulus</i>	Bohemian Waxwing	Bird	0.0	0.3	0.3
<i>Cinclus mexicanus</i>	American Dipper	Bird	0.0	0.0	0.0
<i>Nucifraga columbiana</i>	Clark's Nutcracker	Bird	0.0	0.0	0.0
<i>Pica hudsonia</i>	Black-billed Magpie	Bird	0.0	0.0	0.0
<i>Hirundo rustica</i>	Barn Swallow	Bird	0.0	0.0	0.0
<i>Petrochelidon pyrrhonota</i>	Cliff Swallow	Bird	0.0	0.0	0.0
<i>Riparia riparia</i>	Bank Swallow	Bird	0.0	0.0	0.0
<i>Stelgidopteryx serripennis</i>	Northern Rough-winged Swallow	Bird	0.0	0.0	0.0
<i>Tachycineta bicolor</i>	Tree Swallow	Bird	0.0	0.0	0.0
<i>Tachycineta thalassina</i>	Violet-green Swallow	Bird	0.0	0.0	0.0
<i>Lanius excubitor</i>	Northern Shrike	Bird	0.0	0.0	0.0
<i>Dumetella carolinensis</i>	Gray Catbird	Bird	0.0	0.0	0.0
<i>Anthus rubescens</i>	American Pipit	Bird	0.0	0.0	0.0
<i>Poecile atricapillus</i>	Black-capped Chickadee	Bird	0.0	0.0	0.0
<i>Poecile rufescens</i>	Chestnut-backed Chickadee		0.0	0.0	0.0
<i>Dendroica petechia</i>	Yellow Warbler	Bird	0.0	0.0	0.0
<i>Dendroica townsendi</i>	Townsend's Warbler	Bird	0.0	0.0	0.0
<i>Oporornis tolmiei</i>	MacGillivray's Warbler	Bird	0.0	0.0	0.0
<i>Seiurus noveboracensis</i>	Northern Waterthrush	Bird	0.0	0.0	0.0
<i>Setophaga ruticilla</i>	American Redstart	Bird	0.0	0.0	0.0
<i>Wilsonia pusilla</i>	Wilson's Warbler	Bird	0.0	0.0	0.0
<i>Sitta carolinensis</i>	White-breasted Nuthatch	Bird	0.0	0.0	0.0
<i>Salpinctes obsoletus</i>	Rock Wren	Bird	0.0	0.0	0.0
<i>Troglodytes troglodytes</i>	Winter Wren	Bird	0.0	0.0	0.0
<i>Catharus fuscescens</i>	Veery	Bird	0.0	0.0	0.0
<i>Catharus ustulatus</i>	Swainson's Thrush	Bird	0.0	0.0	0.0

Myadestes townsendi	Townsend's Solitaire	Bird	0.0	0.0	0.0
Vireo gilvus	Warbling Vireo	Bird	0.0	0.0	0.0
Vireo olivaceus	Red-eyed Vireo	Bird	0.0	0.0	0.0
Vireo philadelphicus	Philadelphia Vireo		0.0	0.0	0.0
Calcarius lapponicus	Lapland Longspur	Bird	0.0	0.0	0.0
Melospiza georgiana	Swamp Sparrow	Bird	0.0	0.0	0.0
Melospiza melodia	Song Sparrow	Bird	0.0	0.0	0.0
Passerella iliaca	Fox Sparrow	Bird	0.0	0.0	0.0
Passerculus sandwichensis	Savannah Sparrow	Bird	0.0	0.0	0.0
Plectrophenax nivalis	Snow Bunting	Bird	0.0	0.0	0.0
Poocetes gramineus	Vesper Sparrow	Bird	0.0	0.0	0.0
Euphagus cyanocephalus	Brewer's Sparrow	Bird	0.0	0.0	0.0
Spizella pallida	Clay-colored Sparrow	Bird	0.0	1508.0	1508.0
Spizella passerina	Chipping Sparrow	Bird	0.0	0.0	0.0
Zonotrichia leucophrys	White-crowned Sparrow	Bird	0.0	331.8	331.8
Carduelis flammea	Common Redpoll	Bird	0.0	0.0	0.0
Carduelis hornemanni	Hoary Redpoll	Bird	0.0	0.0	0.0
Leucosticte tephrocotis	Gray-crowned Rosy-Finch	Bird	0.0	0.0	0.0
Agelaius phoeniceus	Red-winged Blackbird	Bird	0.0	0.0	0.0
Euphagus cyanocephalus	Brewer's Sparrow	Bird	0.0	0.0	0.0
Sturnella neglecta	Western Meadowlark	Bird	0.0	0.0	0.0
Xanthocephalus xanthocephalus	Yellow-headed Blackbird	Bird	0.0	0.0	0.0
Passer domesticus	House Sparrow	Bird	0.0	0.0	0.0
Ursus arctos	Brown Bear	Mammal	0.0	0.0	0.0
Bos bison	American Bison	Mammal	0.0	0.0	0.0
Ovis canadensis	Bighorn Sheep	Mammal	0.0	0.0	0.0
Canis latrans	Coyote	Mammal	0.0	0.0	0.0
Vulpes vulpes	Red Fox	Mammal	0.0	0.0	0.0
Castor canadensis	American Beaver	Mammal	0.0	0.0	0.0
Alces americanus	Moose		0.0	0.0	0.0
Cervus canadensis	Elk	Mammal	0.0	0.0	0.0
Odocoileus virginianus	White-tailed Deer	Mammal	0.0	0.0	0.0
Microtus longicaudus	Long-tailed vole	Mammal	0.0	0.0	0.0
Microtus richardsoni	North American Water Vole	Mammal	0.0	0.0	0.0
Neotoma cinerea	Bushy-tailed Woodrat	Mammal	0.0	0.0	0.0
Ondatra zibethicus	Common Muskrat	Mammal	0.0	0.0	0.0
Zapus princeps	Western Jumping Mouse	Mammal	0.0	0.0	0.0
Lynx canadensis	Canadian Lynx	Mammal	0.0	0.0	0.0
Lynx rufus	Bobcat	Mammal	0.0	0.0	0.0
Lepus americanus	Snowshoe hare	Mammal	0.0	0.0	0.0
Mephitis mephitis	Striped Skunk	Mammal	0.0	0.0	0.0
Neovison vison	American Mink	Mammal	0.0	0.0	0.0

<i>Ochotona princeps</i>	American Pika		0.0	0.0	0.0
<i>Marmota monax</i>	Woodchuck	Mammal	0.0	0.0	0.0
<i>Spermophilus columbianus</i>	Columbian Ground Squirrel	Mammal	0.0	0.0	0.0
<i>Ursus americanus</i>	American Black Bear	Mammal	0.0	0.0	0.0
<i>Lasionycteris noctivagans</i>	Silver-haired Bat	Mammal	0.0	0.0	0.0
<i>Myotis lucifugus</i>	Little Brown Myotis	Mammal	0.0	0.0	0.0
<i>Myotis yumanensis</i>	Yuma Myotis	Mammal	0.0	0.0	0.0
<i>Sorex monticolus</i>	Dusky Shrew	Mammal	0.0	0.0	0.0
<i>Sorex palustris</i>	American Water Shrew	Mammal	0.0	0.0	0.0
<i>Pseudacris regilla</i>	Pacific tree frog	Frog	0.0	0.0	0.0
<i>Lithobates sylvaticus</i>	Wood frog	Frog	0.0	0.0	0.0
<i>Rana luteiventris</i>	Columbia Spotted Frog	Frog	0.0	0.0	0.0
<i>Thamnophis sirtalis</i>	Valley Garter Snake	Snake	0.0	0.0	0.0

The next two tables show predicted foods consumed by the number of species in the first table. These are based on continent-wide observations of the foods eaten by each species, so they may not match the food availabilities in your local area. Some discretion will have to be applied in interpreting the results, substituting known local foods for those that are not in your area. Some species, such as Deer Mice, are found in a variety of habitats, both forest and open, so the grass and sedge seed they eat over all habitats may not be applicable to an old growth forest such as in this example. Use your judgement in interpretation. If a food item is not really found in your area, substitute a similar item. An example is the last item in the table, the Musk-ox, which is obviously not found in this area of forest and is an artifact of being part of the continent-wide diet of the Gray Wolf, which is in this area. Substitution of another large ungulate would be prudent.

Also, because the results reflect continent-wide data, the foods are quantified as being needed year-round. It's impossible to account for all the season lengths or permanent residency of species. Of course, there are many species that either migrate or hibernate and only need the foods on a seasonal basis. Adjust accordingly.

The table shows the mass of two different life stages of the available food items. For vegetation, amounts are given for vegetative growth that is eaten, and another amount for the seeds or nuts produced at maturity. For invertebrates and vertebrates, the amounts shown are separated by the young (larval stages, eggs or young) and adult animals. A total for the combination is also given. For this example, only the Post-Harvest Total Mass is provided for comparison. The other two life stage columns are omitted to avoid clutter.

As would be predicted, the results (Change in Mass column) predict lesser use of items (mushrooms, spruce, lichens, moss, ferns) that would be expected in an old growth forest after harvest, with greater use of species that would be considered earlier successional. Of interest is the greater prediction of tree, especially pine, consumption that would indicate consumption



and possible mortality of the new seedlings in the now cut areas. Consumption of an additional 1,723 kilograms over 324 hectares is a lot of tree seedlings.

## Predicted Food Consumption by Vertebrates (Pre- and Post-Harvest Comparison)

Food Item	Type	Vegetation or Young Mass(kg)	Seeds or Mature Mass(kg)	Pre-Harvest Total Mass(kg)	Post-Harvest Total Mass (kg)	Change in Mass (kg)
Grass	Vegetation	5626.6	3333.7	8960.3	9009.2	48.9
Sedge	Vegetation	5537.5	3.8	5541.3	5539.7	-1.6
Herb	Vegetation	1848.7	1651.7	3500.4	3480.1	-20.3
Mushroom	Vegetation	920.2	2345.9	3266.1	2506.9	-759.2
Pine	Vegetation	10.6	2606.7	2617.3	2574.5	-42.8
Insects	Invertebrate	0.0	1751.7	1751.7	1662	-89.7
Douglas-fir	Vegetation	91.6	1654.4	1745.9	1745.8	-0.1
Moths	Invertebrate	1607.0	60.8	1667.8	1687.6	19.8
Spruce	Vegetation	375.0	489.2	864.2	577.4	-286.8
Pine	Vegetation	0.0	851.4	851.4	2574.5	1723.1
Flies	Invertebrate	7.4	251.5	258.9	227.4	-31.5
Beetles	Invertebrate	7.0	250.2	257.2	250.6	-6.6
Cedar	Vegetation	152.6	0.0	152.6	152.6	0.0
Ceanothus	Vegetation	152.6	0.0	152.6	152.6	0.0
Snowberry	Vegetation	152.6	0.0	152.6	152.6	0.0
Rose	Vegetation	152.6	0.0	152.6	152.6	0.0
Birds - small	Vertebrate	124.1	27.4	151.5	108.4	-43.1
Wasps	Invertebrate	0.1	145.5	145.6	131.1	-14.5
Lichen	Vegetation	122.3	0.0	122.3	73.2	-49.1
Juniper	Vegetation	91.6	29.7	121.2	113.5	-7.7
Aspen	Vegetation	91.6	29.7	121.2	111.7	-9.5
Bees	Invertebrate	0.0	120.2	120.2	84.7	-35.5
Tree bark	Vegetation	110.1	7.3	117.4	98.6	-18.8
Dogwood	Vegetation	91.6	21.4	112.9	111.4	-1.5
Elderberry	Vegetation	91.6	14.5	106.0	111.4	5.4
Sap	Vegetation	105.8	0.0	105.8	69.1	-36.7
Moss	Vegetation	102.9	0.0	102.9	84	-18.9
Fern	Vegetation	102.9	0.0	102.9	84	-18.9
Butterflies	Invertebrate	95.3	4.0	99.3	95.8	-3.5
Bugs	Invertebrate	0.0	96.9	96.9	75.5	-21.4
Sagebrush	Vegetation	94.8	0.0	94.8	93.7	-1.1
Saskatoon	Vegetation	91.6	2.7	94.3	99.3	5.0

Berry	Vegetation	0.0	92.4	92.4	59.3	-33.1
Beech	Vegetation	0.0	92.4	92.4	59.3	-33.1
Oak	Vegetation	91.6	0.0	91.6	91.6	0.0
Spiders	Invertebrate	0.0	79.7	79.7	99.1	19.4
Willow	Vegetation	38.8	36.8	75.6	74.2	-1.4
Vole	Vertebrate	0.0	60.1	60.1	65.4	5.3
Grasshoppers	Invertebrate	0.0	54.8	54.8	104.6	49.8
Ants	Invertebrate	0.0	54.1	54.1	91.2	37.1
Carrion	Vertebrate	5.2	45.3	50.4	54	3.6
Blueberry	Vegetation	7.3	34.3	41.6	43.4	1.8
Bark beetles	Invertebrate	40.2	0.1	40.3	18.4	-21.9
Snails	Invertebrate	0.0	39.4	39.4	39.3	-0.1
Sowbugs	Invertebrate	0.0	39.3	39.3	39.2	-0.1
Slugs	Invertebrate	0.0	39.1	39.1	39.1	0.0
Salamander	Vertebrate	0.0	39.1	39.1	39.1	0.0
Mosquitoes	Invertebrate	0.0	36.5	36.5	49.4	12.9
Mouse	Vertebrate	0.0	36.1	36.1	44.5	8.4
Cherry	Vegetation	0.0	31.0	31.0	31.1	0.1
Russian olive	Vegetation	0.0	30.9	30.9	21.4	-9.5
Trees	Vegetation	25.7	1.7	27.4	159.6	132.2
Carpenter ants	Vegetation	0.0	22.9	22.9	15.1	-7.8
Lemming	Vertebrate	0.0	20.9	20.9	32.4	11.5
Whitebark pine	Vegetation	0.0	20.2	20.2	13.3	-6.9
Caddisflies	Invertebrate	5.1	14.3	19.4	15.8	-3.6
Birch	Vegetation	9.9	9.2	19.0	17.4	-1.6
Knotweed	Vegetation	0.0	18.6	18.6	32.8	14.2
Aphids	Invertebrate	0.0	18.1	18.1	12.6	-5.5
Pigweed	Vegetation	0.0	17.3	17.3	65.5	48.2
Ticks	Invertebrate	0.0	16.4	16.4	10.9	-5.5
Ragweed	Vegetation	0.0	16.4	16.4	30.6	14.2
Sorrel	Vegetation	0.0	15.7	15.7	29.9	14.2
Corn	Vegetation	0.0	15.1	15.1	15.1	0.0
Grain	Vegetation	0.0	15.1	15.1	15.1	0.0
Craneflies	Invertebrate	0.0	15.0	15.0	12	-3.0
Lacewings	Invertebrate	0.0	14.4	14.4	9.5	-4.9
Spruce budworm	Invertebrate	11.0	0.0	11.0	7.4	-3.6
Blackberry	Vegetation	0.0	10.2	10.2	17.1	6.9
Dragonflies	Invertebrate	8.3	0.7	9.0	28	19.0
Scale insects	Invertebrate	0.0	8.2	8.2	6.8	-1.4
Worms	Invertebrate	0.0	8.1	8.1	8.1	0.0
Pondweed	Vegetation	0.0	7.5	7.5	7.5	0.0
Gopher	Vertebrate	0.0	7.4	7.4	4.9	-2.5
Shrew	Vertebrate	0.0	7.4	7.4	5.3	-2.1

Earwigs	Invertebrate	0.0	7.4	7.4	4.9	-2.5
Soapberry	Vegetation	0.0	7.3	7.3	41.3	34.0
Amphipods	Invertebrate	0.0	7.1	7.1	7.1	0.0
Squirrel	Vertebrate	0.0	6.2	6.2	4	-2.2
Water lily	Vegetation	0.0	5.5	5.5	5.5	0.0
Rush	Vegetation	2.4	3.0	5.4	5.4	0.0
Stinkbugs	Invertebrate	0.0	5.3	5.3	3.4	-1.9
Horsetail	Vegetation	4.8	0.0	4.8	4.8	0.0
Cattail	Vegetation	4.5	0.0	4.5	4.5	0.0
Deer	Vertebrate	0.0	4.4	4.4	6.7	2.3
Arrowhead	Vegetation	0.3	4.1	4.3	5.7	1.4
Cranberry	Vegetation	0.0	3.9	3.9	3.9	0.0
Weevils	Invertebrate	0.0	3.6	3.6	2.3	-1.3
Laurel	Vegetation	0.0	3.6	3.6	3.6	0.0
Rabbit	Vertebrate	0.0	3.4	3.4	4.1	0.7
Currant	Vegetation	0.0	3.3	3.3	2.2	-1.1
Fireweed	Vegetation	3.3	0.0	3.3	2.2	-1.1
Lily	Vegetation	3.3	0.0	3.3	2.2	-1.1
Mint	Vegetation	0.0	3.3	3.3	2.2	-1.1
Paintbrush	Vegetation	3.3	0.0	3.3	2.2	-1.1
Frog	Vertebrate	0.0	3.1	3.1	2.1	-1.0
Hemlock	Vegetation	0.0	3.0	3.0	2.9	-0.1
Ponderosa pine	Vegetation	0.0	3.0	3.0	2.9	-0.1
Goldenrod	Vegetation	0.0	2.9	2.9	2.9	0.0
Mammals - small	Vertebrate	0.0	2.7	2.7	6.2	3.5
Porcupine	Vertebrate	0.0	2.7	2.7	2.4	-0.3
Beetles - wood boring	Invertebrate	0.0	2.6	2.6	1.7	-0.9
Leafhoppers	Invertebrate	0.0	2.3	2.3	21	18.7
Ivy	Vegetation	0.0	2.3	2.3	2.3	0.0
Raspberry	Vegetation	0.0	2.2	2.2	4	1.8
Smartweed	Vegetation	0.0	2.1	2.1	2.1	0.0
Mountain ash	Vegetation	0.0	2.0	2.0	2	0.0
Alder	Vegetation	0.0	2.0	2.0	3	1.0
Fish	Vertebrate	0.9	1.1	1.9	1.9	0.0
Mayflies	Invertebrate	0.0	1.6	1.6	9.9	8.3
Mistletoe	Vegetation	0.0	1.6	1.6	1.6	0.0
Beaver	Vertebrate	0.0	1.5	1.5	1.9	0.4
Lamb's quarters	Vegetation	0.0	1.4	1.4	1.4	0.0
Wild rye	Vegetation	0.0	1.4	1.4	1.4	0.0
Leeches	Invertebrate	0.0	1.2	1.2	1.2	0.0
Thrush	Vertebrate	0.9	0.3	1.2	1.1	-0.1
Termites	Invertebrate	0.0	1.1	1.1	6.2	5.1
Loon	Vertebrate	0.9	0.0	0.9	0.9	0.0

Sparrow	Vertebrate	0.9	0.0	0.9	0.9	0.0
Frogs	Vertebrate	0.9	0.0	0.9	0.9	0.0
Tamarack	Vegetation	0.0	0.8	0.8	0.6	-0.2
Grouse	Vertebrate	0.3	0.4	0.7	0.5	-0.2
Damselflies	Invertebrate	0.0	0.7	0.7	24.1	23.4
Duckweed	Vegetation	0.0	0.6	0.6	0.6	0.0
Poison ivy	Vegetation	0.0	0.6	0.6	0.5	-0.1
Cottonwood	Vegetation	0.0	0.6	0.6	0.4	-0.2
Elk	Vertebrate	0.0	0.6	0.6	1.4	0.8
Clover	Vegetation	0.6	0.0	0.6	3.3	2.7
Weasel	Vertebrate	0.0	0.5	0.5	0.3	-0.2
Cicadas	Invertebrate	0.0	0.5	0.5	2	1.5
Millepedes	Invertebrate	0.0	0.5	0.5	0.5	0.0
Moose	Vertebrate	0.0	0.5	0.5	1.4	0.9
Gnats	Invertebrate	0.0	0.4	0.4	0.3	-0.1
Midges	Invertebrate	0.4	0.0	0.4	0.3	-0.1
Dandelion	Vegetation	0.0	0.4	0.4	0.4	0.0
Mammals - large	Vertebrate	0.0	0.4	0.4	0.4	0.0
Jay	Vertebrate	0.0	0.3	0.3	0.2	-0.1
Hawk	Vertebrate	0.0	0.3	0.3	0.2	-0.1
Spruce beetles	Invertebrate	0.0	0.3	0.3	0.2	-0.1
Needleminers	Invertebrate	0.0	0.3	0.3	0.2	-0.1
Caribou	Vertebrate	0.0	0.3	0.3	1.1	0.8
Waterlily	Vegetation	0.3	0.0	0.3	1.7	1.4
Sheep	Vertebrate	0.0	0.3	0.3	0.3	0.0
Woodpecker	Vertebrate	0.0	0.2	0.2	0.1	-0.1
Rosehip	Vegetation	0.0	0.2	0.2	0.3	0.1
Mountain goat	Vertebrate	0.0	0.2	0.2	0.4	0.2
Waterfowl	Vertebrate	0.1	0.0	0.1	0.1	0.0
Maple	Vegetation	0.0	0.1	0.1	0.1	0.0
Strawberry	Vegetation	0.0	0.1	0.1	0.2	0.1
Burdock	Vegetation	0.0	0.1	0.1	0.1	0.0
Weed	Vegetation	0.0	0.1	0.1	143	142.9
Bison	Vertebrate	0.0	0.1	0.1	0.4	0.3
Muskrat	Vertebrate	0.0	0.1	0.1	0.1	0.0
Algae	Vegetation	0.0	0.0	0.0	0	0.0
Stoneflies	Invertebrate	0.0	0.0	0.0	0	0.0
Blackbird	Vertebrate	0.0	0.0	0.0	0	0.0
Dove	Vertebrate	0.0	0.0	0.0	0	0.0
Chipmunk	Vertebrate	0.0	0.0	0.0	0	0.0
Snake	Vertebrate	0.0	0.0	0.0	0	0.0
Ground squirrel	Vertebrate	0.0	0.0	0.0	0	0.0
Cicada	Invertebrate	0.0	0.0	0.0	0	0.0

Crickets	Invertebrate	0.0	0.0	0.0	0.9	0.9
Fir	Vegetation	0.0	0.0	0.0	0	0.0
Musk-ox	Vertebrate	0.0	0.0	0.0	0.2	0.2