

Forests and Wildlife

Page 1

History and Legislation

- Forest Reserve Act 1891 – allowed president to set aside timber-covered lands for the federal government to keep
- Gifford Pinchot: first head of U.S.D.A. Division of Forestry 1905-1910 (later became U.S. Forest Service)
- Multiple Use-Sustained Yield Act (1960)
- Wilderness Act (1964)
- National Environmental Policy Act (1969)
 - EIS
 - required to solicit and consider public comment
- National Forest Management Act (1976)
 - Dept. of Ag required to consider economic & environmental aspects

Page 2

Forests and Wildlife

- Forests occupy 1/3 of the total land area of the U.S.
 - 2/3 of forests classified as commercial timberland
- Factors affecting suitability of forest habitats
 - age
 - patch size
 - patch shape
 - composition (tree species)
 - internal structure (vertical complexity)
 - distribution of across landscape (connectivity and juxtaposition)
 - human access (roads)

Page 3

Forests, Wildlife, and Fungi

- Mycorrhizal fungi – integrate with plant roots, increasing water & nutrient uptake
 - greatly improve vigor & growth of trees
- Some mycorrhizal fungi produce hypogeous (underground) fruiting bodies (e.g., truffles)
- Spores are dispersed by foraging animals, especially flying squirrels, that dig up the truffles

Page 4

Plant Succession and Forest Wildlife

- Succession begins when plant community is disturbed.
 - e.g. fire, insect, disease, wind, timber harvest
 - coarse-scale vs. fine-scale disturbance
 - Shade-intolerant species give way to shade-tolerant
- “Climax” forest is not static
 - gap succession
- Each wildlife species is favored by certain seral or climax communities.

Forest management can partially replace natural processes

Page 5

Plant Succession and Shade Tolerance

- **Shade-intolerant:** larch (tamarack), aspen, white (paper) birch, persimmon
- **Intermediate:** White pine, oaks, hickories, red maple
- **Most shade-tolerant:** hemlock, beech, sugar maple, spruces

Page 6

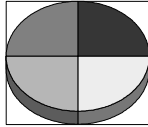
Forest Management for Wildlife

- **Silviculture**

- practice of manipulating forest vegetation to control forest growth and composition.

- **Rotation time**

- time from stand establishment to “financial maturity”



■ 1st Cut
□ 2nd Cut
▨ 3rd Cut
□ 4th Cut

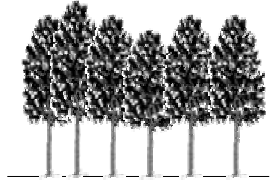
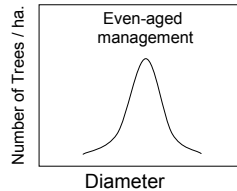
- **Cutting sequence**

- pattern of cutting across entire area

Page 7

Even-Aged Management

- **Even-aged management** - individual stands composed of trees of same age, usually the same size.



Page 10

Even-Aged Management

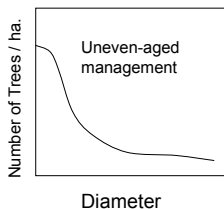
- **Clearcutting** - removal of all trees from an area.
 - Regrowth induced by seeding, planting, natural seeding
- **Shelterwood cutting** - removal of all trees except a few trees that provide shade & windbreak.
- **Seed tree cutting** - large trees left as source of seed.

Even-Aged Management

- **Benefits**
 - New growth of nutritious forage
 - Increases edge
 - Favors shade-intolerant plant species
 - Size of clear cut determines value to wildlife
- **Drawbacks**
 - Destroys cover for animals (temporary)
 - Erosion, especially on steep slopes
 - Increases fragmentation & edge (detrimental to interior species)

Page 11

Uneven-aged management



Page 12

Uneven-aged management

- **Management for continuous high forest cover**
 - single trees
 - Cut every 5-30yrs
 - individuals from all age classes removed
 - promotes shade tolerant species.
 - Group selection cut - miniature clear cut.
 - Used for less shade tolerant species.
- **Costs and benefits**
 - can produce a variety of micro-habitats for many species
 - favors regrowth of shade-intolerant species
 - higher rate of disturbance than clearcut

Page 13

Forests and Roads

- USFS currently manages about 380,000 miles of roads (circle the earth 15 times)
- 8 times the mileage of the interstate highway system
- uses
 - logging & mining
 - fire management
 - hunting, fishing, hiking, camping, mushrooming
 - recreation is now the largest use
- problems
 - erosion
 - some wildlife species (e.g., elk) avoid roads
 - expensive to maintain
- NFMA requires new roads to be revegetated within 10 years if possible

Page 13

Enhancing Habitat for Forest Wildlife

“...the needs of all animals cannot be met in the management plans for a single forest. Some management may be designed to enhance *species richness*, whereas other management may be direct toward one or a few *featured species*.”

Bolen & Robinson

Page 14

Enhancing Habitat for Forest Wildlife

- **Snags**
 - Provide cavities for nesting and denning animals
 - food source for insectivorous animals
 - perch site for birds
 - What makes a good snag. (Neitro et al. 1985)
 - hard
 - large diameter
 - tall
 - lots of bark left
 - Creating snags
 - blasting tops, injecting herbicide or fungi

Page 15

Enhancing Habitat for Forest Wildlife

- **Nest Boxes**
- **Dead logs as habitat**
 - store nutrients
 - help retain soil moisture and reduce erosion
 - Fungi
 - Ex: in Blue Mts., OR, 179 vertebrate spp. use logs as habitat

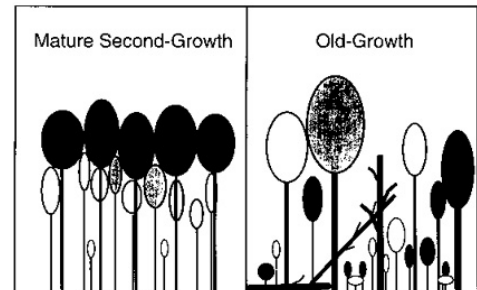
Page 16

Old-growth Forest

- **Characteristics:**
 - uneven aged, shade-tolerant species
 - very large, very old (≥ 180 years) trees are present
 - large snags & woody debris are plentiful
 - gap regeneration (1 to few trees die & fall, creating gap)
 - multi-layered canopy
 - low human visitation & disturbance

Page 17

Old-growth Forest



Page 18

Old-growth Forest

- Old-growth dependent wildlife:
 - Northern spotted owls
 - marbled murrelets
 - pine marten
 - Pacific giant salamander

Page 18

Things to Remember

- History & Legislation
- Forest-wildlife interactions & fungi
- Timber harvest management tries to mimic succession
- Pros & Cons of management schemes
 - even-aged management
 - uneven-aged
- Actions to enhance forest habitat
- Old-growth characteristics & wildlife

Page 23