

**SPECIES CONSIDERATIONS**

Wisconsin forests are composed of a wide variety of species. Some occur as pure stands, while others occur in association with each other in complex communities. Each species has a unique set of silvical characteristics which result in differing silvicultural requirements. As a result of these differences, each species presents a different aesthetic management challenge. In order to be more effective, the forest manager must carefully evaluate the specific biological requirements of each species. The favorable elements must be identified and used to greatest advantage, and alternative management strategies must be devised to overcome the less favorable elements. In terms of aesthetic management, these considerations fall into the following general categories: silvicultural system, life span, stocking level, and insect and disease considerations.

**SILVICULTURAL SYSTEM****A. All-age Selection System**

In general, species amenable to all-age selection type cutting can be managed with the least difficulty in aesthetically sensitive areas. The species making up the northern hardwood timber type are prime examples.

- Because of the mixture of species found in this type, a high degree of visual diversity occurs naturally.
- Since only selected trees are removed with each harvest, logging impact and slash accumulations are minimized.
- Regeneration occurs naturally through periodic harvest cuts, precluding the need for intensive follow-up treatments (cutting of residual trees, root raking, prescribed burning, etc.) to ensure adequate regeneration.
- The natural age diversity usually found in this type, combined with the minimal disturbance of selection-type cutting, means that large stands can be treated with little visual impact.

**B. Even-age Management System**

Species managed on an even-age basis present a greater challenge.

- The need to provide a high degree of sunlight to ensure regeneration necessitates a substantial (shelterwood) or complete (clearcut) removal of the overstory canopy.
- Additional measures necessary to ensure establishment and survival of regeneration (prescribed fire, scarification, root raking, etc.) may further compound the visual impact.
- The regeneration phase may be rather lengthy, especially where artificial regeneration is necessary. This makes the need for advance planning (sale shape, timing of adjacent cuts, and utilization) even more critical.
- The relatively large visual impact of even-age harvests makes it more difficult to deal with large stands. Efforts are required to reduce stand size and increase age diversity through manipulation of harvest dates.

When evaluating the impact of a given silvicultural system, thought must be given to not only the harvest method but also the entire series of activities necessary to regenerate the stand and return it to full production. For example, the clearcut of a given stand may be acceptable in a certain location if natural regeneration can be expected in a very short time. That same clearcut may not be acceptable if prescribed burning, furrowing, and hand planting are required, unless additional measures (reduction in sale size, more imaginative sale shape, etc.) are taken to reduce the overall impact.

Figures 80.1 and 80.2 compare the overall visual impacts of all-age and even-age systems.

**LIFE SPAN**

The average life spans of the various species encountered by forest managers fall into three general categories:

| <u>Short-lived</u> | <u>Medium-lived</u> | <u>Long-lived</u> |
|--------------------|---------------------|-------------------|
| Aspen              | Paper birch         | Sugar maple       |
| Jack pine          | Tamarack            | Oak               |
| Balsam fir         | Red maple           | Basswood          |
|                    | Hickory             | Elm               |
|                    |                     | Ash               |
|                    |                     | Hemlock           |
|                    |                     | Yellow birch      |
|                    |                     | Spruce            |
|                    |                     | Red pine          |
|                    |                     | White pine        |
|                    |                     | Cedar             |
|                    |                     | Beech             |

Age span, in terms of aesthetic management, has two important implications:

- The longer the age span, the less frequently it is necessary to regenerate the stand. More low intensity, intermediate selective cuts are possible. Fewer high intensity harvest cuts and less follow-up regeneration will be required.
- In general, when short-lived species reach their pathological rotation age ("break up"), it is on a stand basis. When aspen and jack pine, for example, near the end of their life span, entire stands lose vigor over a relatively short period of time. Prompt, oftentimes drastic, action is necessary to avoid substantial economic losses as well as lost regeneration opportunities. When long-lived species begin to "break up", however, it is generally on an individual tree basis. When dealing with overmature northern hardwood, hemlock hardwood, red pine, or white pine stands, for example, individual trees succumb over a fairly long period of time. This permits recovery of economic values and regeneration of the stand with much less intensive measures.

Insect and disease problems in short-lived and long-lived species follow a similar pattern. When short-lived species are attacked (e.g., hypoxylon canker, jack pine budworm, forest tent caterpillar, etc.), the entire stand is usually affected. When longer-lived species are attacked (e.g., Dutch elm disease, root rot -- *Armillaria mellea*, bark beetles, etc.), usually only low-vigor trees within the stand are affected. Even a heavy Dutch elm disease infestation in a northern hardwood stand, for example, can usually be handled without excessive visual impact.

These life span considerations make advance planning with short-lived species, in particular, absolutely essential. Only through maximum flexibility in sale timing and design can problems be avoided. If problem situations are not identified early, this flexibility is lost.

**STOCKING LEVEL**

In some cases, departures from normally recommended basal area stocking levels may be desirable for aesthetic purposes. Examples include:

- Reducing basal area
  - Increases visual penetration and reduces "tunnel effect".
  - Provides an opportunity to underplant or enhance understory development.
  - Increases diameter growth -- enhances "big tree" appearance.
- Increasing basal area

- Reduces frequency of entry.
- Promotes natural "forest primeval" appearance.
- Increases screening value and decreases visual penetration.

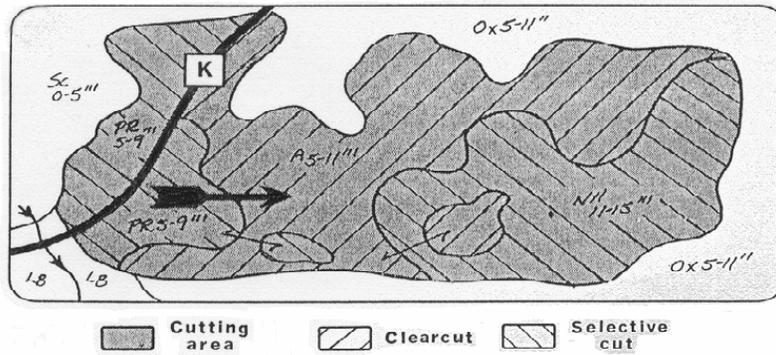
The flexibility of a given species in terms of stocking levels varies. Some species (red pine, white pine, aspen, northern hardwoods, oak) can be maintained at levels above or below normally recommended standards without substantial losses in quality or increased mortality. Other species (jack pine, white birch, hemlock, balsam fir, spruce) must be kept very near recommended levels; otherwise insect and disease susceptibility is substantially increased.

### **INSECT AND DISEASE CONSIDERATIONS**

In evaluating any given species for aesthetic management adaptability, insect and disease constraints must be considered. In some cases, a deviation from normal management practices, even if it is silviculturally sound, may not be feasible due to potential insect or disease problems. The forest entomologist should be consulted to avoid unforeseen problems which might result from departures from normal management practices. Some of the departures that result in insect or disease problems include:

- Underplanting in red pine sawlog stands -- Sirococcis strobilinus.
- Holding overmature clumps in balsam fir and jack pine stands for screening purposes -- budworm.
- Retention of large, well-formed elm when marking road sides -- Dutch elm disease.
- Holding basal areas excessively high in red pine stands -- bark beetles.
- Excessive basal area reductions in jack pine, hemlock, white birch -- logging shock.
- Retention of scattered red pine sentinels in newly established red pine plantations -- Sirococcis strobilinus.
- Retention of scattered oak in new pine plantations -- root rot.

**Figure 80.1** Impact of cutting method on apparent sale size -- selective cut.

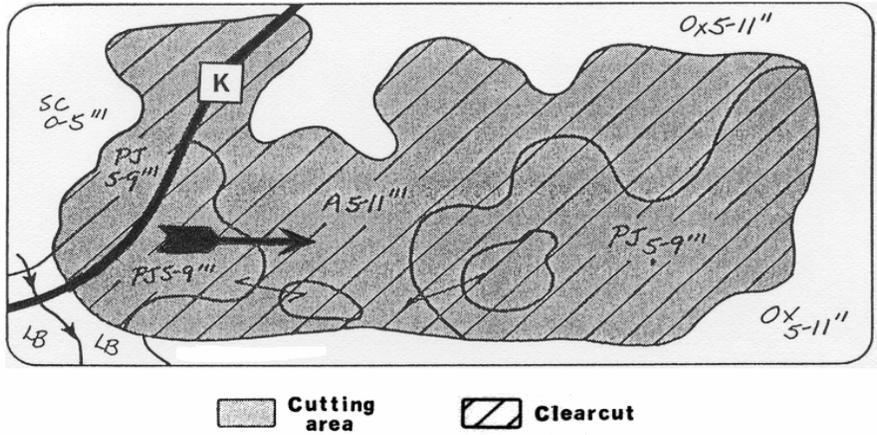


View of sale area looking in the direction indicated.

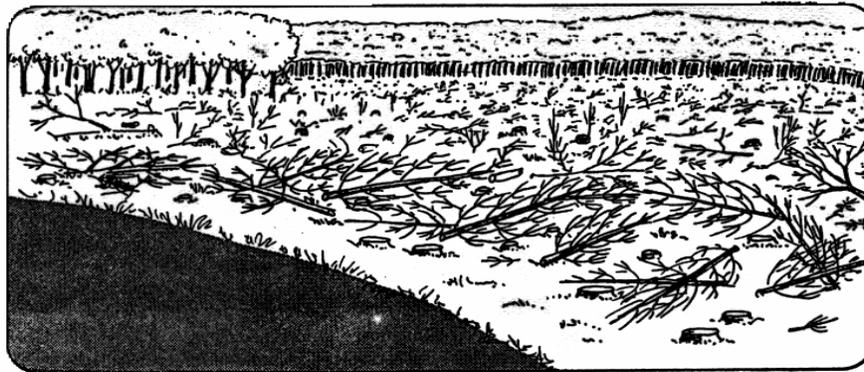


The silvicultural system needed to ensure adequate regeneration has a major impact on overall visual impact. The timber sales outlined in Figures 80.1 and 80.2 are identical in acreage, but the selective cutting system called for in the red pine and northern hardwoods stands in Figure 80.1 will greatly reduce the visual impact of the overall timber sale.

**Figure 80.2** Impact of cutting method on apparent sale size -- clearcut.



View of sale area looking in the direction indicated.



The entire sale area in Figure 80.2 must be clearcut to ensure adequate regeneration. In addition, the jack pine stand along the road will require intensive site preparation and planting efforts over a fairly long period before regeneration becomes evident. The combined effects of both these silvicultural requirements may make the overall visual impact of this sale unacceptable unless additional sale design measures are taken.