This presentation/lecture for the most part is self-explanatory. The presentation is from a webinar conducted a few years ago. I will emphasize a few of the pertinent points, but the slides give most of the information. A few of the slides at the end are photos of prominent invasive species, just to give examples. If you are interested in more detail about these species, reference the publication at the following link: [https://www.srs.fs.fed.us/pubs/gtr/gtr_srs131.pdf](https://www.srs.fs.fed.us/pubs/gtr/gtr_srs131.pdf) You do not need to know these individual invasive plants for the exam.

The PPT has 6 slides per page rather than 3 slides per page

**Page 1**

Definitions of a healthy forest, both ecologically and socially. These aspects are inter-related. Most all forests have been influenced by humans either physically or by environmental change (climate variability).

No one is against healthy forests, but some actions or mgmt. scenarios to maintain or improve healthy forests may be judged otherwise

**Page 2-6**

Indicators of forest health

- Capacity for renewal ---- regeneration
- Resiliency (which includes resistance)
- Meet current desires and uses, both present and future

Generally, we are not trying to return to a vegetation state from 50 to 100 years ago because the environment at that time cannot be duplicated. However, the objective is for the process to return the same ecosystem function

Review factors that influence resiliency from the slides

Common present conditions of stands often lead to unhealthy forests

- Aging/declining trees
- Non-native invasive spread and accumulation
- Overstocked stands
- Off-site species
- Excessive midstory
- Excessive fuels
- High-graded and disturbed forests
Through managing the basics — sunlight, density, and matching species to sites, the following activities promote healthy forests and amend unhealthy conditions

- Thinning
- Diversity of species
- Logging damage
- Regenerate mature stands
- Control invasives

Slides are presented to emphasize management activities to promote more healthy conditions. You have seen many of these slides before.

**Pages 7-9**

Invasive Species impact Biodiversity, Ecosystem Function, Economies (scale), Aesthetics, and Human Health

Two well-known invasive pests — Chestnut Blight — airborne fungus
Dutch Elm Disease — Fungus spread by boring beetles

Statistics about Invasives — What causes “harm” is open to interpretation and scale

Common forest pests or invasives in Tennessee or in adjacent states that could impact Tennessee

How do Invasives Get Here? Examples
Intentional — autumn olive fruits for wildlife, kudzu for erosion control, ornamentals for visuals such as mimosa or paulownia. Tennessee has the 3rd largest nursery industry in the US. Nursery industries are always looking for or breeding new plants with visual appeal that people will buy to enhance their landscapes

Indirect Introductions — Packing material, seed mixes, crop contaminants, etc

Typically found in disturbed areas — roadsides, ditches, rights-of-way, fields, pastures, cutover forests, etc. where bare mineral soil is exposed to windblown seed

**Rate of spread slides (Page 9) — populations and reproduction builds for a period of time (lag phase) before invasion takes place, then population explodes and spreads. Control of invasives take place BEFORE the populations explode where control becomes more futile and expensive —**

**Pages 10-12**

What can be done to deter colonization and spread of invasives

- Be able to identify
• Anticipate invasive response to management activities and disturbances
• Control escaped populations of invasives
• Do not plant or use seed of invasives

Series of photographs of invasive plants common to or adjacent to Tennessee

Pages 12-14
Impact of silvicultural operations on invasives

Most operations are disturbance events that may be beneficial to invasives. Thus, must monitor and control invasive populations when they are small before populations spread and get out-of-control.

Forest mgmt. activities that can be sites for invasion of invasives ---- harvests, roads and skid trails, site prep, prescribed burning, intermediate operations (thinning), tree planting

Invasive plant programs usually include: Prevention, detection and monitoring, control and containment, and research/education

Control methods are similar to site prep techniques to control vegetation with the same advantages and disadvantages ------ manual, mechanical, chemical (herbicide), biological, burning

CONTROL INVASIVES when populations are small

TAKE HOME MESSAGES

1. Prevention through management activities. Should be part of the prescription
2. Maintain a diversity of species ----- do not put all your eggs in one basket such that if something impacts one species, other unimpacted species will still be present
3. Maintain vigorous trees so that forests do not become too old or become too dense. Promote regeneration and thinning practices where appropriate
4. Control invasives

Summary ----- would like to have or maintain all successional stages in the forest ---- early, mid-, and late to promote forest health ------ provides diversity as well as vigorous trees in all stages of succession. Would also wish to have some overmature stages (very susceptible to natural disturbances) to provide these vegetative/habitat conditions, but difficult to maintain.

Active management usually will promote vigorous trees and healthy forests. Do not allow stands to become overstocked (tree stress) or excessively old (not vigorous). Relate tree populations to human populations in this manner.