

Managing at the Stand Scale: Wildlife

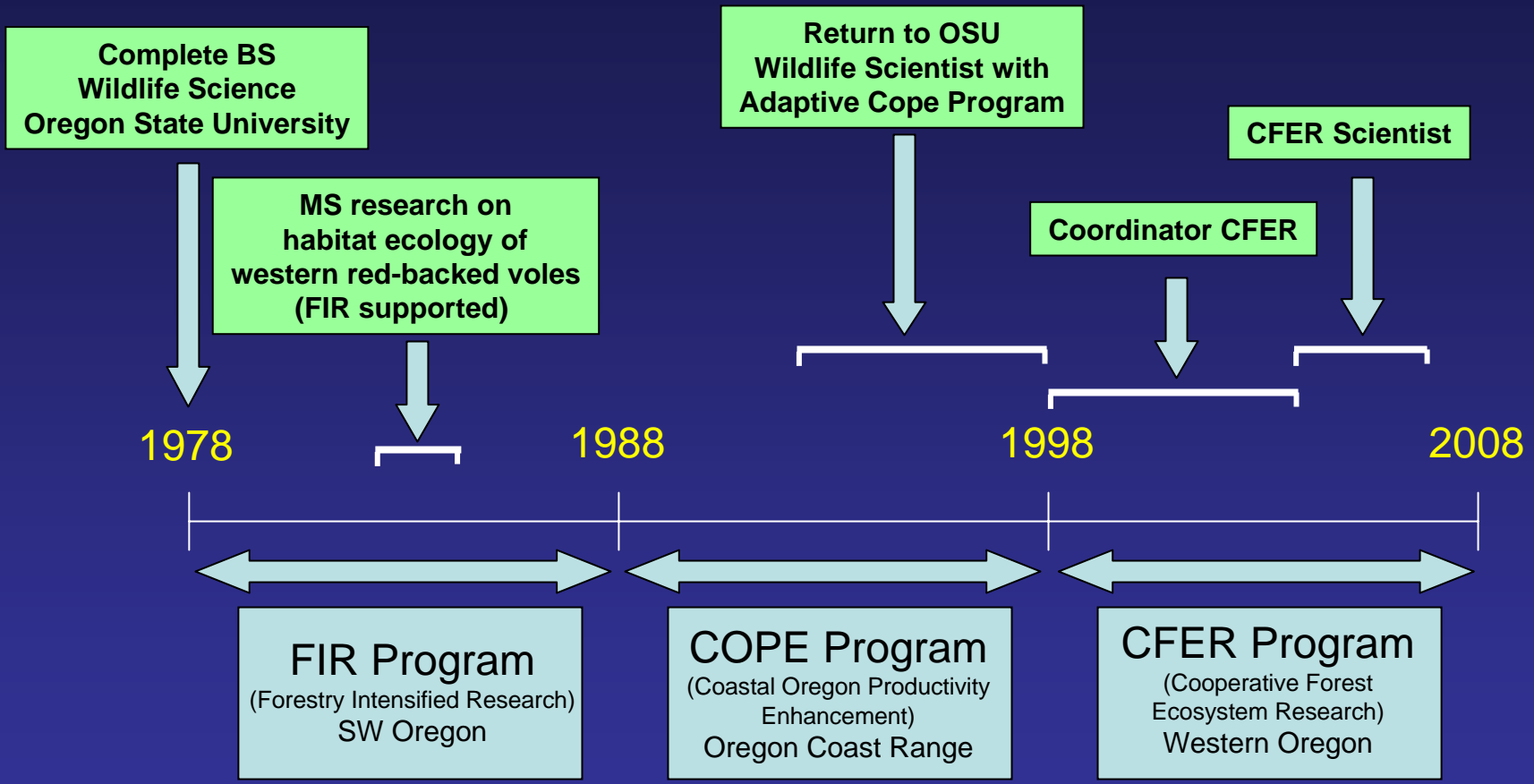
John P. Hayes



CFER wildlife studies related to stand structure

- Monitoring Avian Response to Density Management (Edge/Weikel; 2000)
- Bird Response to Thinning (Hayes/Weikel; 2001)
- Small Mammal Response to Thinning (Hayes/Larson; 2001)
- Trophic Relations among Birds, Arthropods, and Shrubs (Starkey/Hagar 2003)
- Influence of Silviculture and Downed Wood on Small Mammals (Hayes/Waldien; 2005)
- Response of Small Mammals to Fuels Management (Edge/Manning; 2002)
- Validation of Songbird Habitat Models (Edge/Wilson; 2001)
- Influences of Post-fire Salvage Logging on Wildlife Populations (Hayes/Manning 2007)
- Response of Birds to Fire Mosaics (Hayes/Cannon 2008)

My Professional Career



Cooperative Forestry Research
in Western Oregon

Key questions

What critical elements of forest stands influence habitat quality for wildlife?

How does forest management influence wildlife populations directly and indirectly through influences on those habitat characteristics?

How do species of conservation concern respond to forest management at the stand scale?

Foci adopted
in CFER
to uncover
relationships

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graph TD; A([Foci adopted in CFER to uncover relationships]) --> B[Population response to management]; A --> C[Individual use of habitat elements]; B --> D[Mechanistic relationships underlying responses]; C --> D;
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Population response
to management

Individual use of habitat
elements

Mechanistic relationships
underlying responses

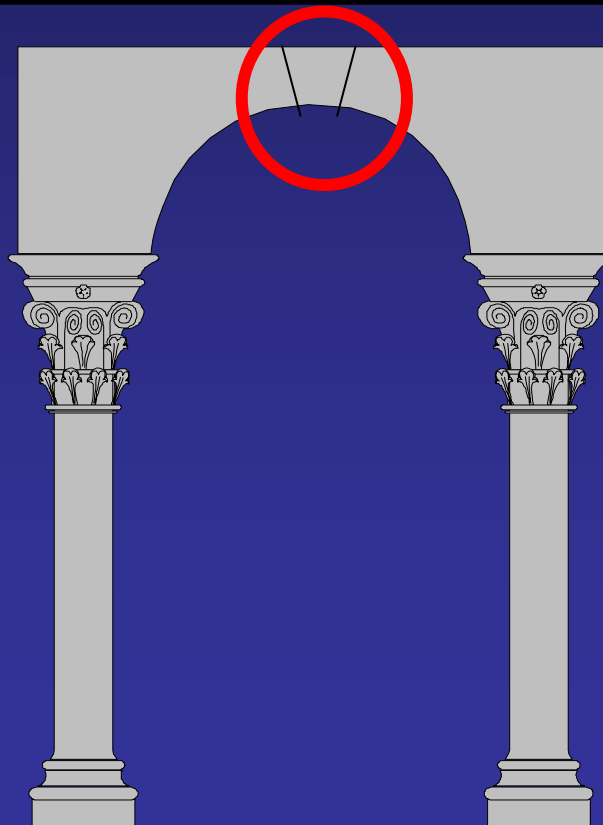
What understanding about wildlife and stand structure has been significantly strengthened by CFER?

Understanding of the importance of particular habitat structural elements for wildlife.

Keystone structure

"A distinct spatial structure providing resources, shelter, or 'goods and services' **crucial** for other species"

Individual use
of habitat elements



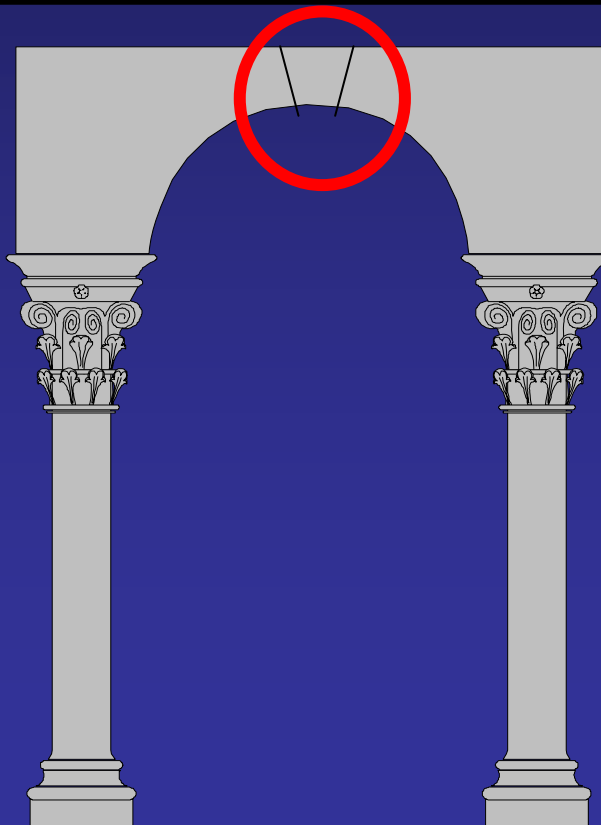
Tews et al. 2004.
J. Biogeography 31:79-92.

Keystone structure

"A distinct spatial structure providing resources, shelter, or 'goods and services' **crucial** for other species"

Keystone structures
studied in CFER

Snags
Shrubs
Down wood



Tews et al. 2004.
J. Biogeography 31:79-92.

Snags



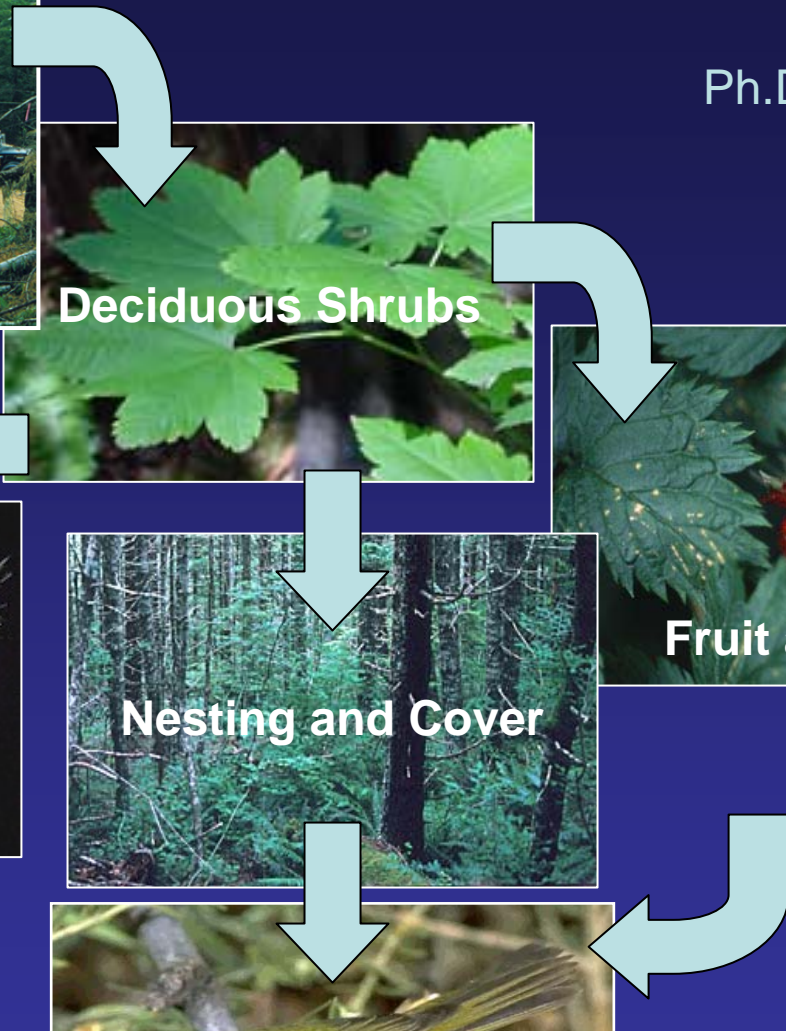
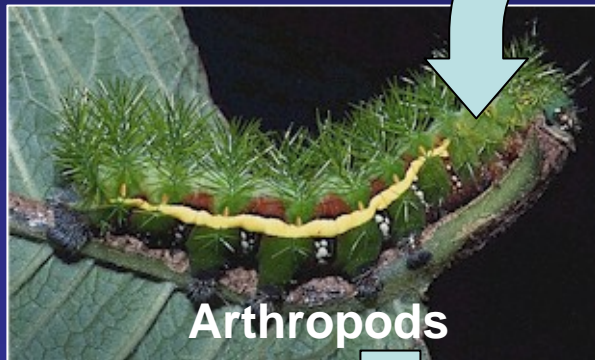
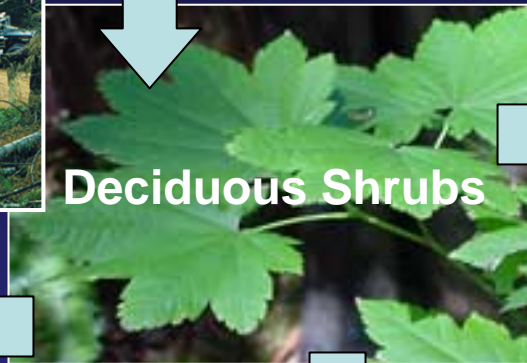
CFER research has documented the importance of snags in the nesting, roosting, and foraging ecology of several species of wildlife.

Key findings include the importance of retaining some snags away from riparian buffers for some species and patterns of use of snags in post-fire forests.



Shrubs

Hagar
Ph.D. Dissertation
2004



Down wood



CFER research has documented significant influences of down wood on the behavioral ecology of species and individual survival.

However, fundamental questions concerning quantitative relationships of downed wood and wildlife population response remain.

What understanding about wildlife and stand structure has been significantly strengthened by CFER?

Understanding of the importance of particular habitat structural elements for wildlife.

Active management of forests for complex forest structure generally maintains or supports habitat for many species of wildlife in the short- and long-term.

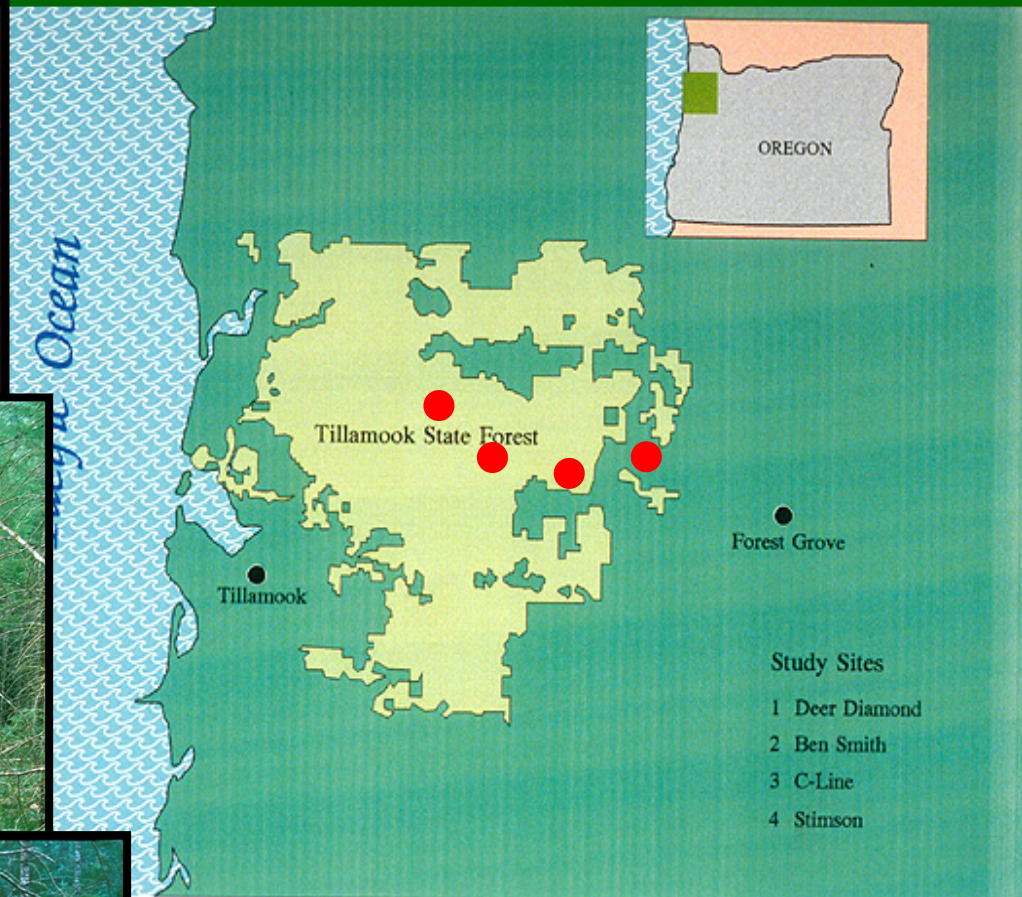
Control stand



Moderate thin



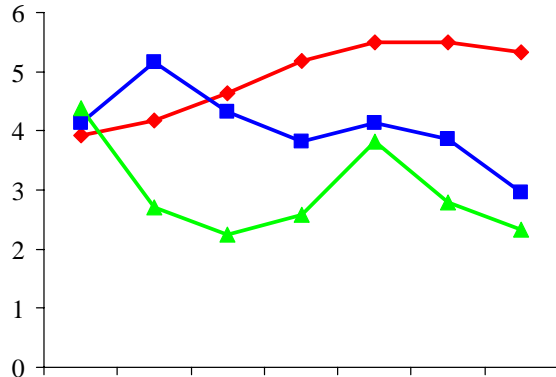
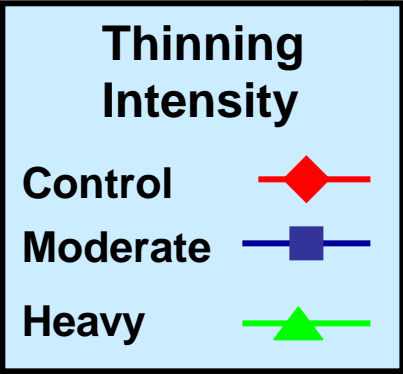
Heavy thin



The Tillamook Thinning Study

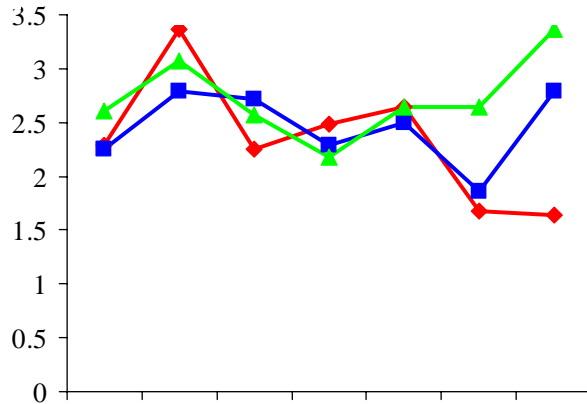
Response of birds to thinning

Number of detections per visit



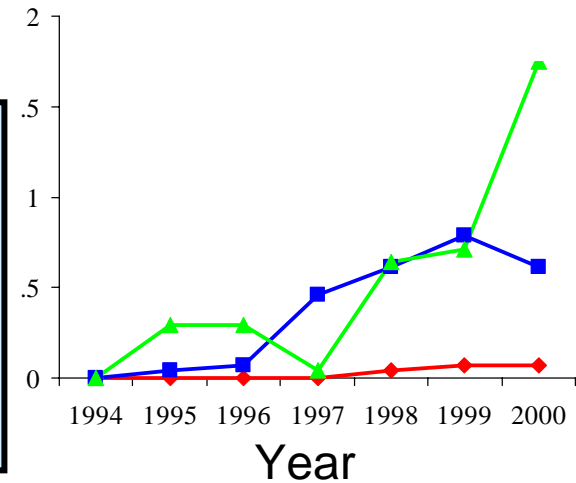
Pacific-slope flycatcher

Decreased
(9 species)



Wilson's warbler

No change
(5 species)



Hammond's flycatcher

Increased
(8 species)

Bottom line from studies of responses of birds, bats, small mammals, amphibians, and flying squirrels to thinning...

Some species increase,
Some species stay the same,
Some species decrease,
Some species use thinned sites that don't use unthinned sites,
No species (that we know of) are extirpated by thinning.

My conclusion: Forests subjected to active management for complex conditions can likely maintain or support habitat for many species of wildlife in the short- and long-term.

Key questions

What critical elements of forest stands influence habitat quality for wildlife?

How does forest management influence wildlife populations directly and indirectly through influences on those habitat characteristics?

How do species of conservation concern respond to forest management at the stand scale?

The Hayes Quality of Understanding Assessment

Conceptual understanding



Mechanistic foundation for understanding



Applicability of results to management



What critical elements of forest stands influence habitat quality for wildlife?

Conceptual understanding



Mechanistic foundation for understanding



Applicability of results to management



How does forest management influence wildlife populations directly and indirectly through influences on those habitat characteristics?

Conceptual understanding



Mechanistic foundation for understanding



Applicability of results to management



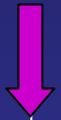
How do species of conservation concern respond to forest management at the stand scale?

Conceptual understanding

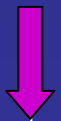
Stump species

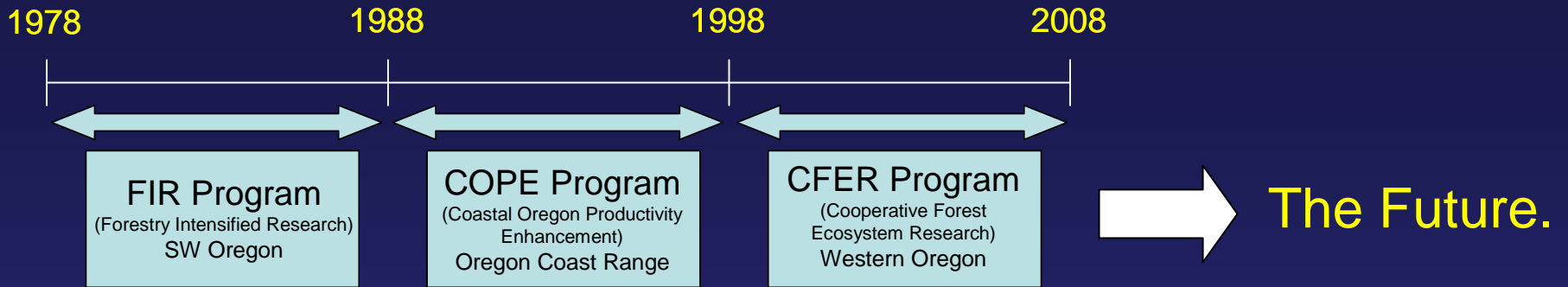


Mechanistic foundation for understanding

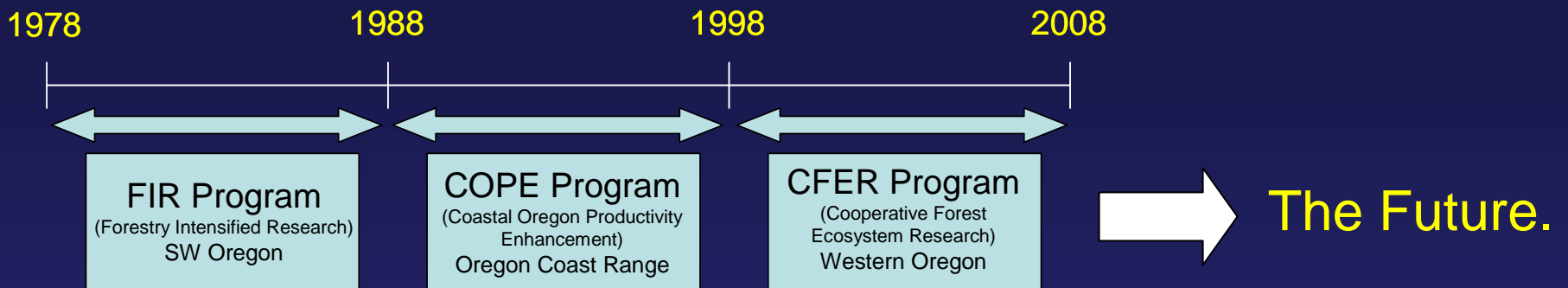


Applicability of results to management





What is next for studies of stand structure and wildlife?
(the humble opinion of a person who will be doing
none of the work himself)



What is next for studies of stand structure and wildlife?
(the humble opinion of a person who will be doing
none of the work himself)

Stronger connection to demographics and population viability.

Studies directly linking observed patterns to underlying causal factors, mechanisms, and the behavioral ecology of species.



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