

A man with grey hair, wearing a light-colored short-sleeved shirt and a green lanyard, is shown in profile, looking intently at a tree branch he is holding with both hands. The background is a dense forest of green trees. The text is overlaid on the right side of the image.

# **SILVAH-OAK: Ensuring Adoption by Engaging Users in the Full Cycle of Forest Research**

The USDA Forest Service NE Station  
The PA DCNR Bureau of Forestry  
The Pennsylvania State University

# Case Study Conceptual Framework

- “Users, partners and interested *people are engaged* throughout the entire research and development cycle:
  - identifying information, research and delivery needs;
  - setting research and delivery priorities;
  - planning program delivery;
  - disseminating and supporting the use of FS R&D products.”

USFS R&D Program Delivery Logic Model, 12/04

# Case Study Ecological Framework

- Long-standing difficulty regenerating oak on mesic sites (Lorimer 1993, Crow 1988)
- About half of PA forests are mixed oak type (Alerich 1993)
- Intensive data on advance regeneration collected in PA by FIA in late 80's showed:
  - About 10% of forests had enough advance regen to sustain overstory spp. comp at high deer densities
  - About 27% of forests had enough for low deer densities

# PA DCNR (key partner) asked research for help



- Already using a USFS R&D product for management of northern & Allegheny hardwoods
- Could we develop a similar tool for mixed oaks?
- Simultaneously launched studies in operational mixed oak regeneration cuts on state forest lands

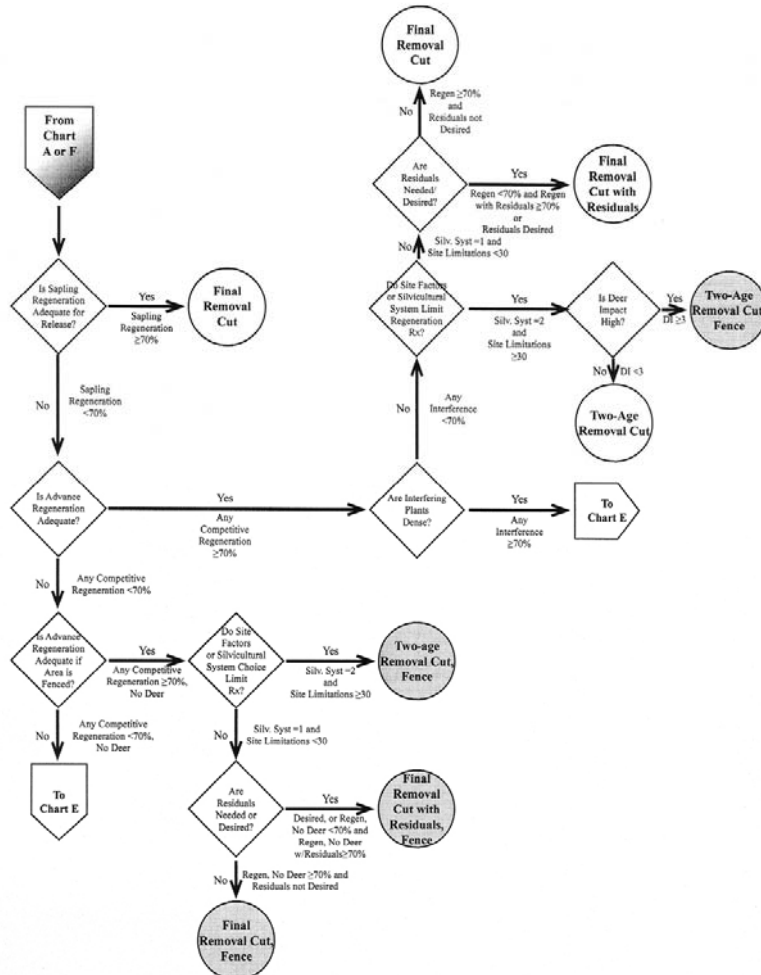
# The SILVAH Framework



- Inventory existing overstory **and understory** conditions
- Analyze data systematically
- Prescribe treatment to reduce challenges and increase assets

# The SILVAH Approach to Rx

Chart D. All Forest Types – Releasing Desirable Regeneration



- Systematically assess stocking of overstory, understory, and interference
- When regeneration called for, Select Rx to reduce interference and/or enhance advance regen

# The SILVAH Approach

- Decisions that are:
  - Objective
  - Consistent
    - Across foresters
    - Across stands
  - Measurable and remeasurable
- A basis—not a substitute—for professional judgment



# User Involvement Process – *Develop a similar tool for mixed oaks*

1. DCNR, USFS, PSU  
and others work  
together (January  
2000)

- What is known?
- Structure what is known  
in SILVAH format
- What are knowledge  
gaps?
- Design and fund  
research to close  
knowledge gaps



# What is Known?

- Oak Regeneration research conducted in other regions:
  - Ivan Sanders' work in Missouri, Ohio, KY
  - David Loftis' work in NC
  - Gottschalk, Miller, and Smith in WV
  - Brose, VanLear and others in VA
- Focused on predicting the probability of success for oak seedlings based on their pre-harvest characteristics

# What is Known (II)?

- Gary Miller's restatement of the oak regeneration problem:



**“Disturbance event (harvest) occurs when probability of successful regeneration is low”**

# What is Known (II)?



- Pat Brose's previous work suggested that root collar diameter was a better predictor of oak seedling growth and survival than height

# Structure to SILVAH framework

- Modify SILVAH to accommodate three classes of oak seedlings:



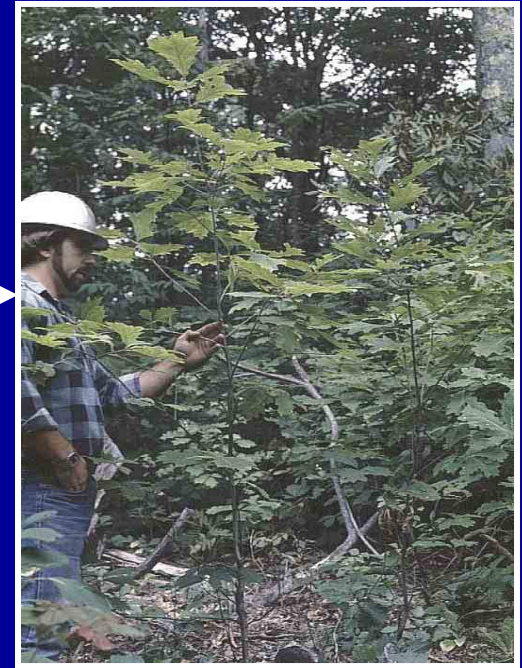
**New**

**< 0.25" RCD and  
< 6" HT**



**Established**

**0.25 – 0.75" RCD  
and 6 – 36" HT**



**Competitive**

**> 0.75" RCD and  
> 36" HT**

# Identify Knowledge Gaps

- Are dominance probabilities developed elsewhere applicable in PA forests?
- Which silvicultural treatments move seedlings most rapidly through these stages?
- What treatments work for reducing barriers to growth and survival of oak seedlings (ferns, mountain laurel, other tree species, deer, acid rain)?

# Design (and fund) studies to fill knowledge gaps

- Gottschalk – Dominance probability study in Pennsylvania
- Miller and Kochenderfer – Studies of fencing and low shade removal in WV & PA
- Brose – Role of fire in oak regeneration, Development of appropriate fuels models for eastern mixed oak forests, Methods of reducing mountain laurel
- Brose & Long – Does lime addition affect oak seedling survival and growth with and without protection from deer?

# User Involvement Process – *Develop a similar tool for mixed oaks*

## 2. Beta-testing of “SILVAH-OAK”

- USFS R&D, PSU offer training to 90+ PA DCNR foresters in **proposed SILVAH-OAK** inventory, analysis, and prescription (June 2000)
- One forester per district gathers with researchers to provide feedback (Fall 2000)



# Adaptations to Increase Use

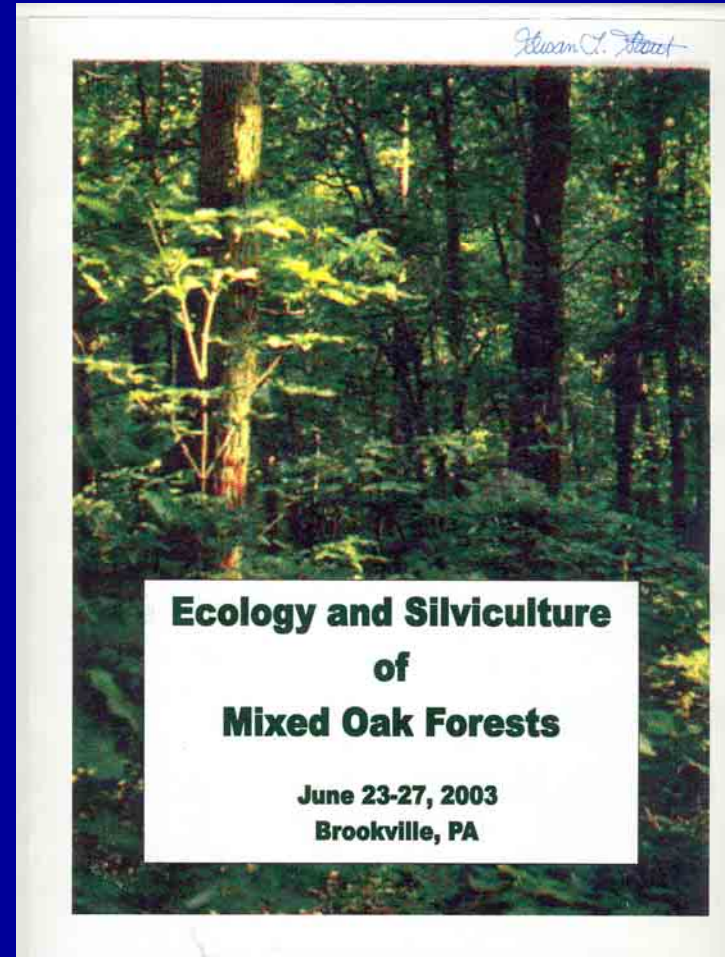
- Don't need to assess root collar diameter on every seedling on every plot
- Prescriptions need to vary by site class & physiographic region





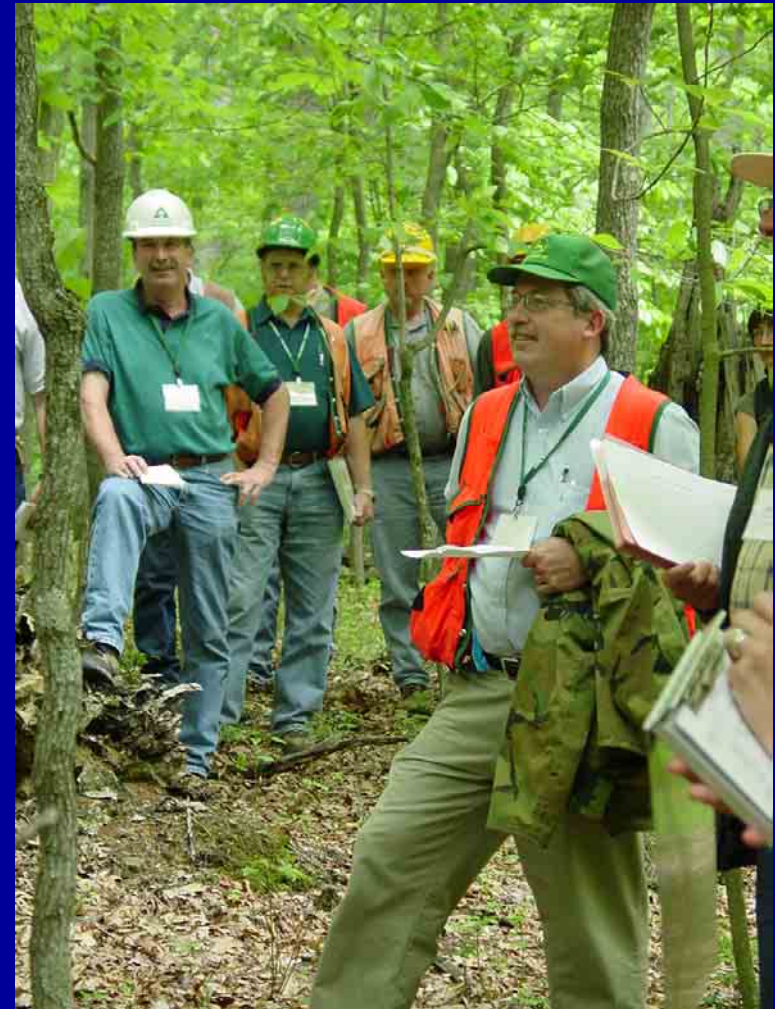
# User Involvement Process – *Develop a similar tool for mixed oaks*

4. DCNR adopts SILVAH-OAK as SOP in mixed oak forests on State Forest land
5. Scientists and managers design and beta-test a weeklong training session to promote adoption of SILVAH-OAK beyond DCNR in PA



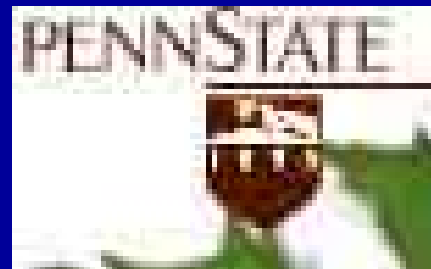
# User Involvement Process – *Develop a similar tool for mixed oaks*

6. Invited to offer SILVAH-OAK training in WV (Summer 2004)
7. New partner – The Nature Conservancy – invites SILVAH team to increase work in OH, add invasive plants



# Meanwhile, in parallel

- Penn State research team is developing models of oak regeneration in ridge and valley province based on operational treatments
- Adopt their results when feasible
- Long term goal is “convergence”



# In the future....

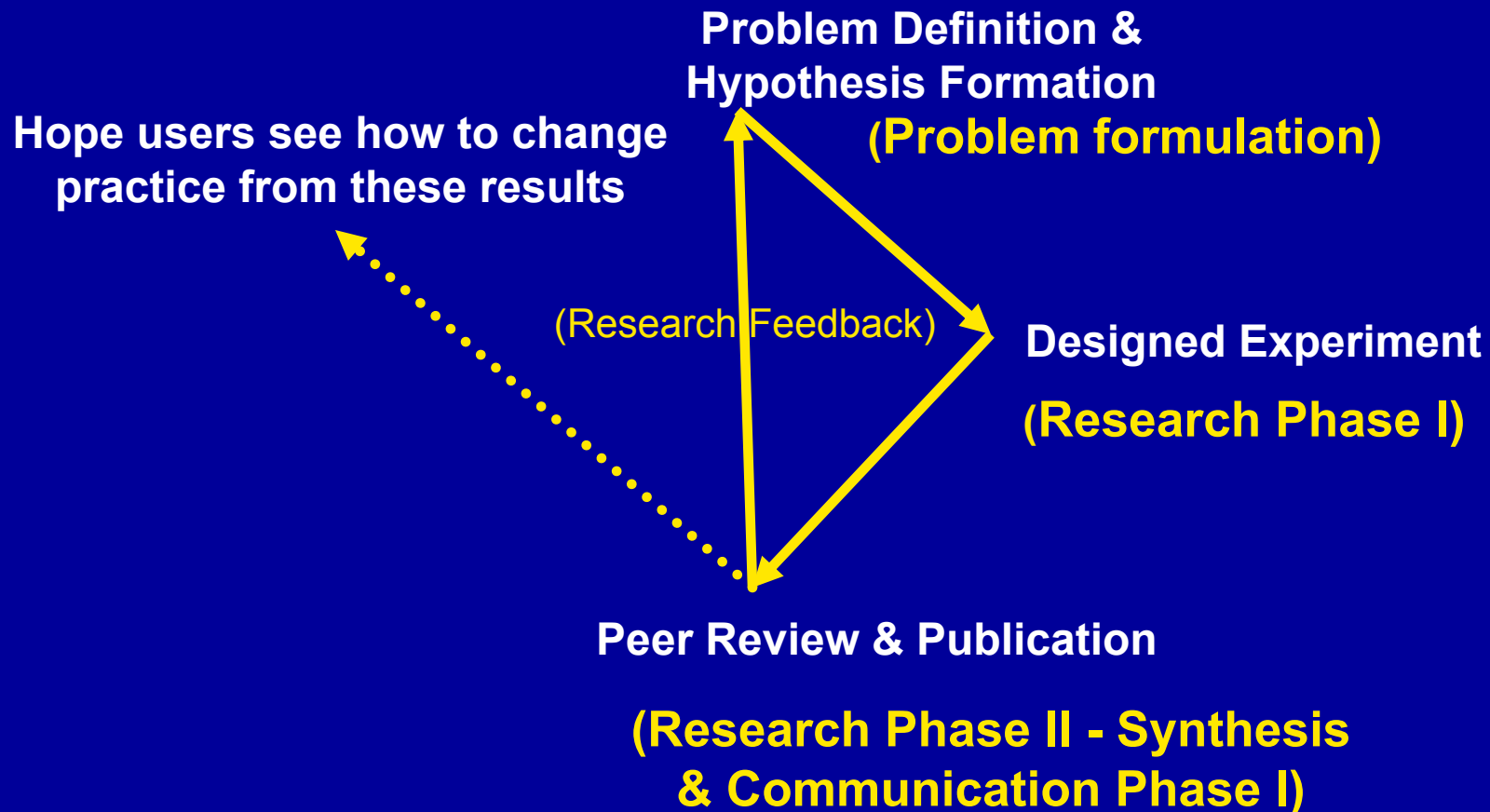
- Integrate research results
- “Converge” with Penn State results
- Publish GTR on use of SILVAH-OAK
- Monitor results of adoption on the ground



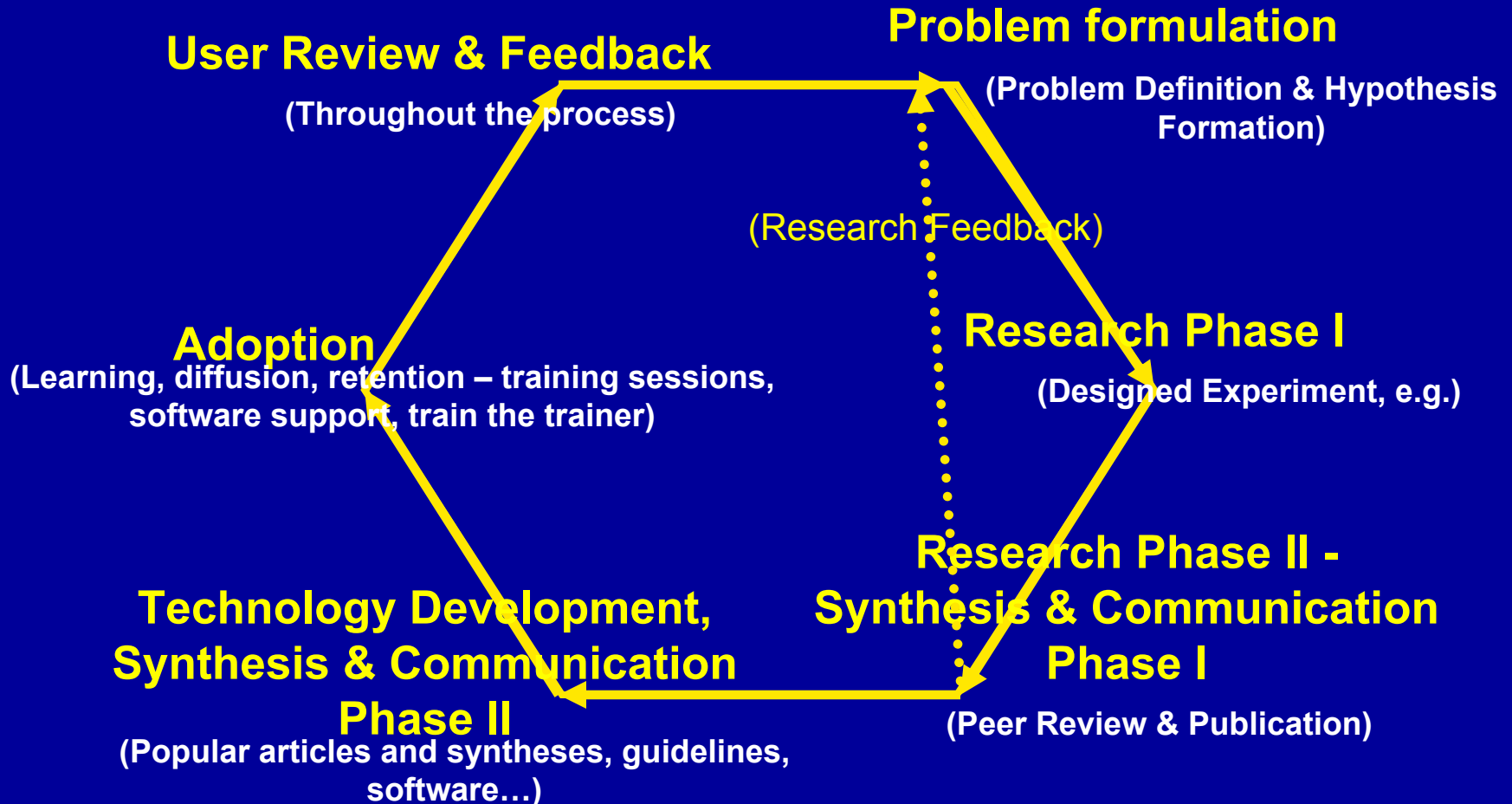


**Lessons learned:**

# Traditional Science Model



# User Involvement Model



# Each group learns new behaviors

- Users learn patience to wait through scientific process – rigidity of site selection is one of most difficult communication challenges
- Scientists learn that their best answer is often useful even before the experiment is fully finished
- Scientists learn to recognize real-world constraints for managers – time and \$\$\$

# Lessons Learned

- Success breeds success – partner appreciation for SILVAH drove partnership on SILVAH-OAK



# Lessons Learned

- Partnership between management and research based on mutual respect improves management **AND** research

