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Assessment of Instream Habitat in the Oregon Coast Coho ESU

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Factors for Decline
NOAA (1998)

Habitat	Harvest	Disease & Predation	Regulatory Mechanisms	Other Natural or Human
Channel form	Marine	Disease	NW Forest Plan	Drought
Substrate	Recreational	Predation	Forest Practices	Floods
Roughness	Scientific		Dredge and Fill	Ocean Conditions
Estuaries			Water Quality	Artificial Propagation
Wetlands			Ag Practices	
Riparian Areas			Urban Growth	
Water Quality				
Streamflows				
Passage				
Habitat Elimination				

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Data Source

- ODFW random, spatially balanced habitat surveys
  - 1st through 3rd order streams within range of coho
  - 1998 – 2003 summer surveys
  - ~ 45 sites per Monitoring Area per year
  - Each site 500 – 1,000 meters long (usually 1,000)
  - Standard ODFW habitat survey protocols

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Survey Parameters Used In This Analysis

Decline Factor: **Substrate**

- **% Gravel in riffles**
- **% Fines in riffles**

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Survey Parameters Used In This Analysis

Decline Factor: **Channel Form**

- **% pools**
- **% deep pools**
- **% slack water pools**
- **% side channel**
- **Channel morphology index**

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Survey Parameters Used In This Analysis

Decline Factor: **Roughness**

- **Wood volume**
- **Wood pieces**
- **Wood key pieces**
- **% bedrock**

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What is the trend in instream habitat conditions?

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ESU Trend Analysis 1998-2003

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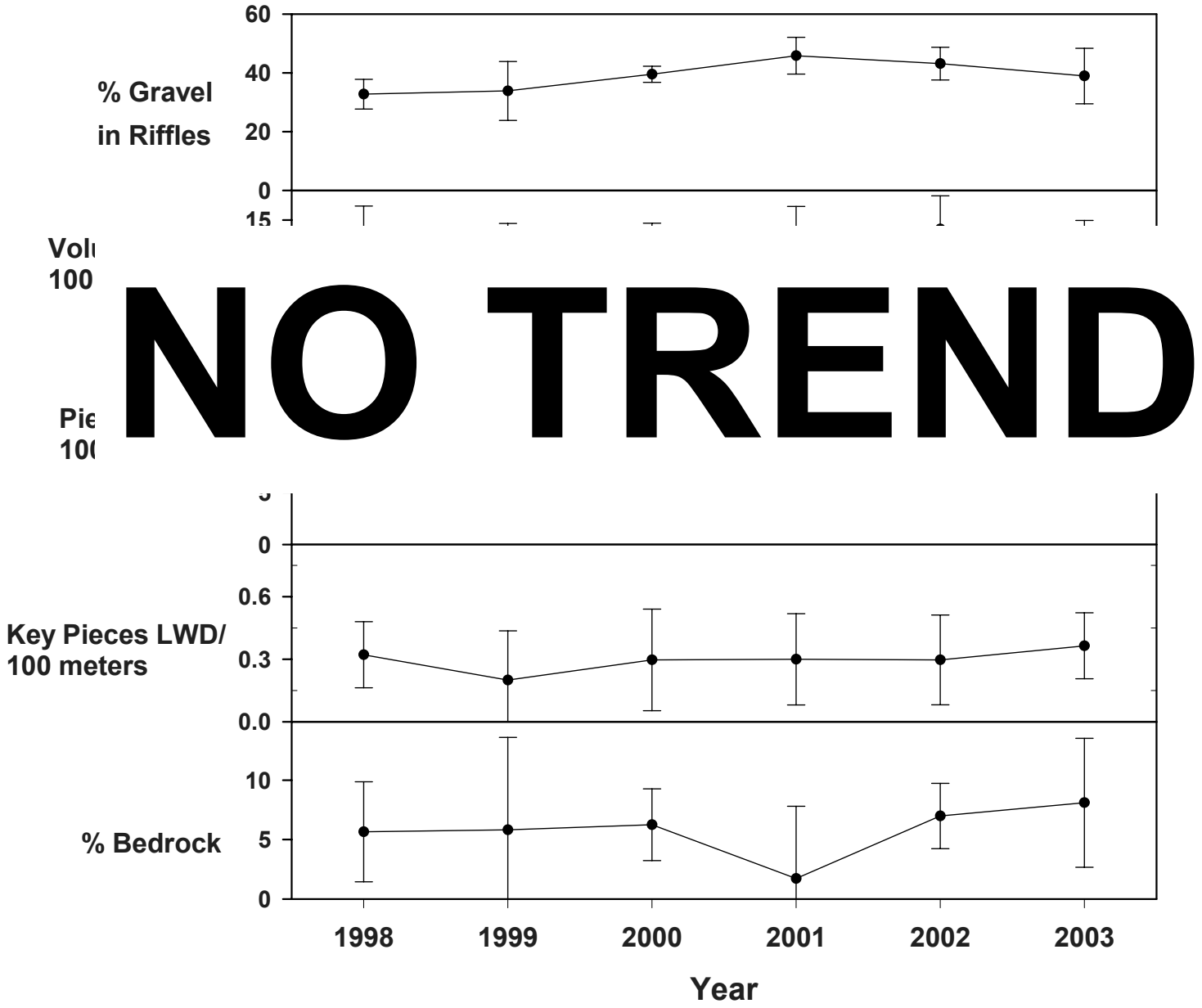

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ESU Trend Analysis 1998-2003

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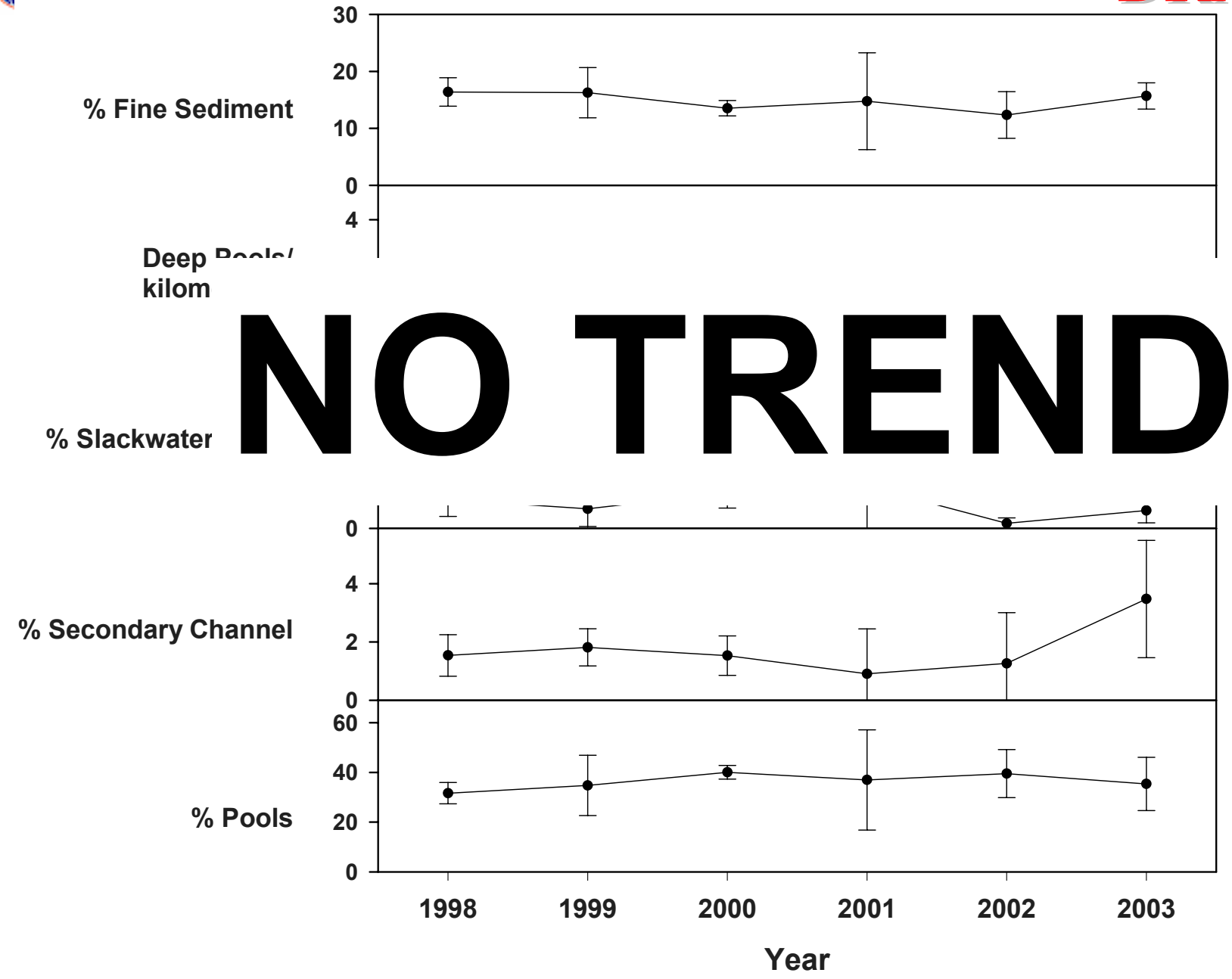

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What is the status of instream habitat conditions?

- Combined data from 1998 – 2003
- Compared to conditions at 124 reference sites
- As with water quality reference sites, physical habitat reference sites differ from random sample sites primarily by management intensity
- See handout for 1st quartile breakpoints for each habitat variable

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Status of Instream Physical Habitat In Oregon Coast Coho ESU

	Spawning Gravel	Instream Roughness				Fine Sediment	Channel Morphology				
Spatial Scale	% Gravel in riffles	Volume LWD	Pieces LWD	Key Pieces LWD	% Bedrock	% Fines in riffles	Deep pools	% SW pools	% Second. channel	% Pools	Channel Morph. Index
ESU (N=353)	Similar	Worse	Worse	Worse	Worse	Worse	Better	Better	Worse	Similar	Worse
North Coast (N=118)	Similar	Worse	Similar	Worse	Similar	Worse	Similar	Better	Similar	Similar	Similar
Mid-Coast (N=110)	Better	Worse	Worse	Worse	Worse	Similar	Similar	Similar	Similar	Better	Worse
Mid-South Coast (N=77)	Similar	Worse	Worse	Worse	Similar	Similar	Similar	Similar	Worse	Similar	Worse
Umpqua (N=62)	Worse	Worse	Worse	Worse	Worse	Similar	Similar	Similar	Worse	Similar	Worse

Significantly less large wood in random surveys compared to reference conditions

Color Key

- Better Than Reference Conditions
- Similar To Reference Conditions
- Worse Than Reference Conditions

Significantly more entrenched streams than reference conditions

May not be different from reference but reference may not be good – average of 3,200 beavers trapped each year (1998-2003)

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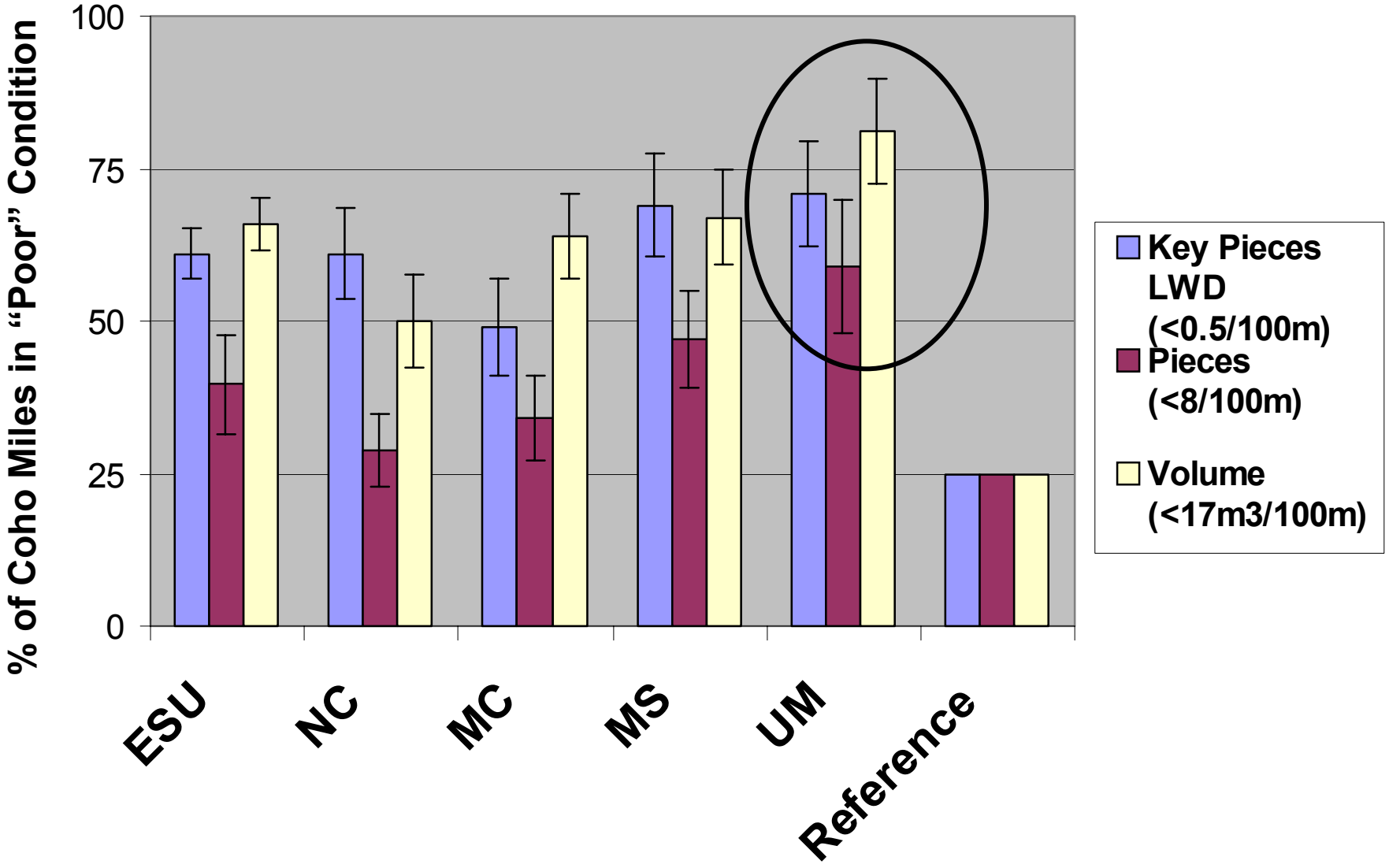
Percentage of ESU in "Poor" Category for Three Large Wood Measures



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What is the status of instream habitat condition by landuse?

- Landuse identified by GIS using a 200 foot buffer on each side of digital stream arcs

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Landuse Comparisons

	Spawning Gravel	Instream Roughness				Fine Sediment	Channel Morphology				
Landuse	% Gravel in riffles	Volume LWD	Pieces LWD	Key Pieces LWD	% Bedrock	% Fines in riffles	Deep pools	% SW pools	% Second. channel	% Pools	Channel Morph. Index
Agriculture (N=43)											
Pvt. Indust. Forest (N=111)											
Pvt. Non-Indust. Forest (N=42)											
Urban (N=15)											
Federal Forest (N=93)											
State Forest (N=45)											

Significantly less large wood on private lands compared to public lands

Color Key

- Better Than Reference Conditions
- Similar To Reference Conditions
- Worse Than Reference Conditions
- Inadequate Sample Size

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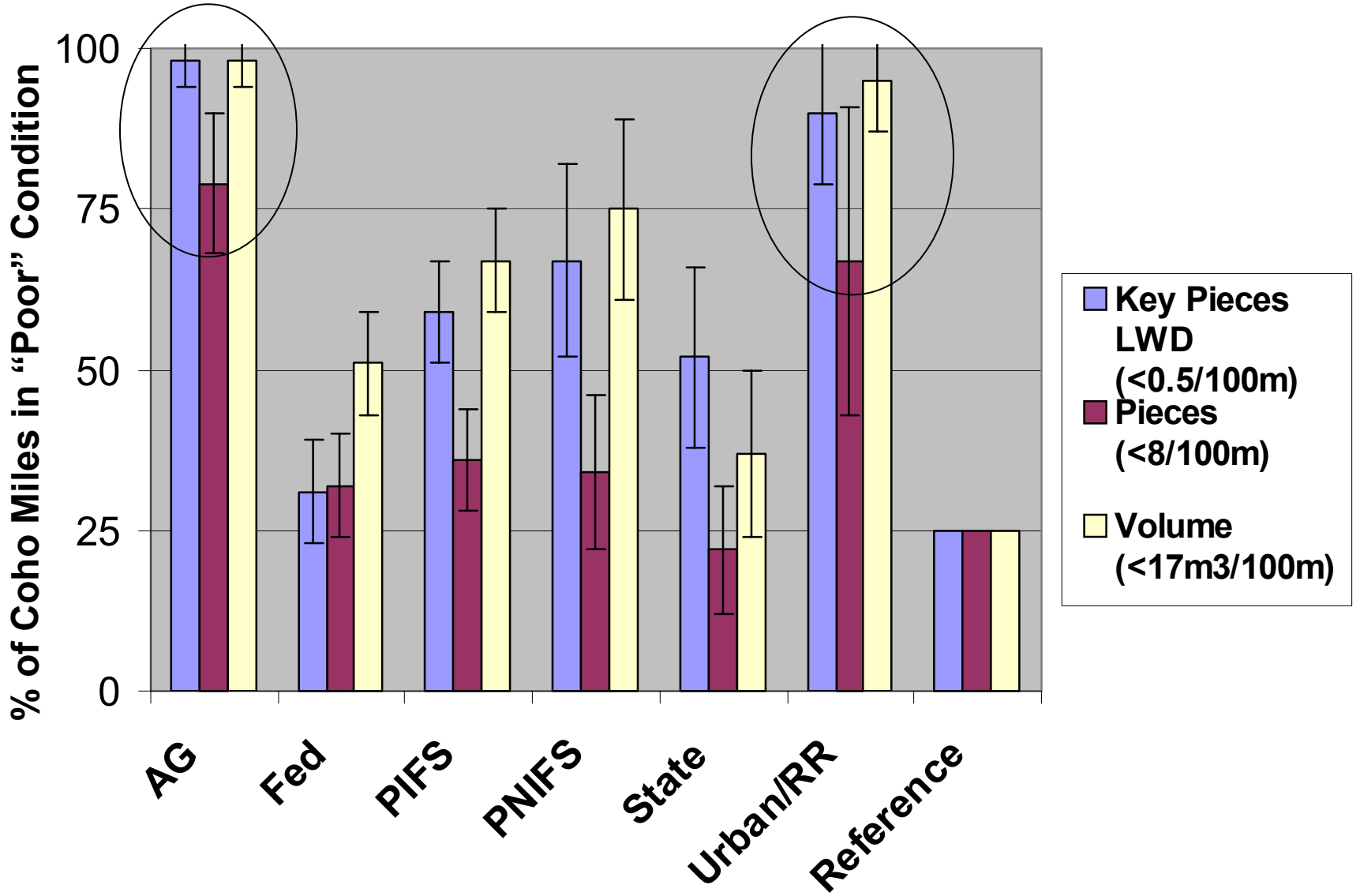
Percentage of Each Landuse in "Poor" Category for Three Large Wood Measures



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Instream Habitat Status and Trend Conclusions

- No detectable trend since 1998
- Significantly higher channel entrenchment
- Significantly less large wood
- Umpqua has less large wood than other areas
- Public lands have more large wood than private lands

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Instream Habitat Restoration Analysis

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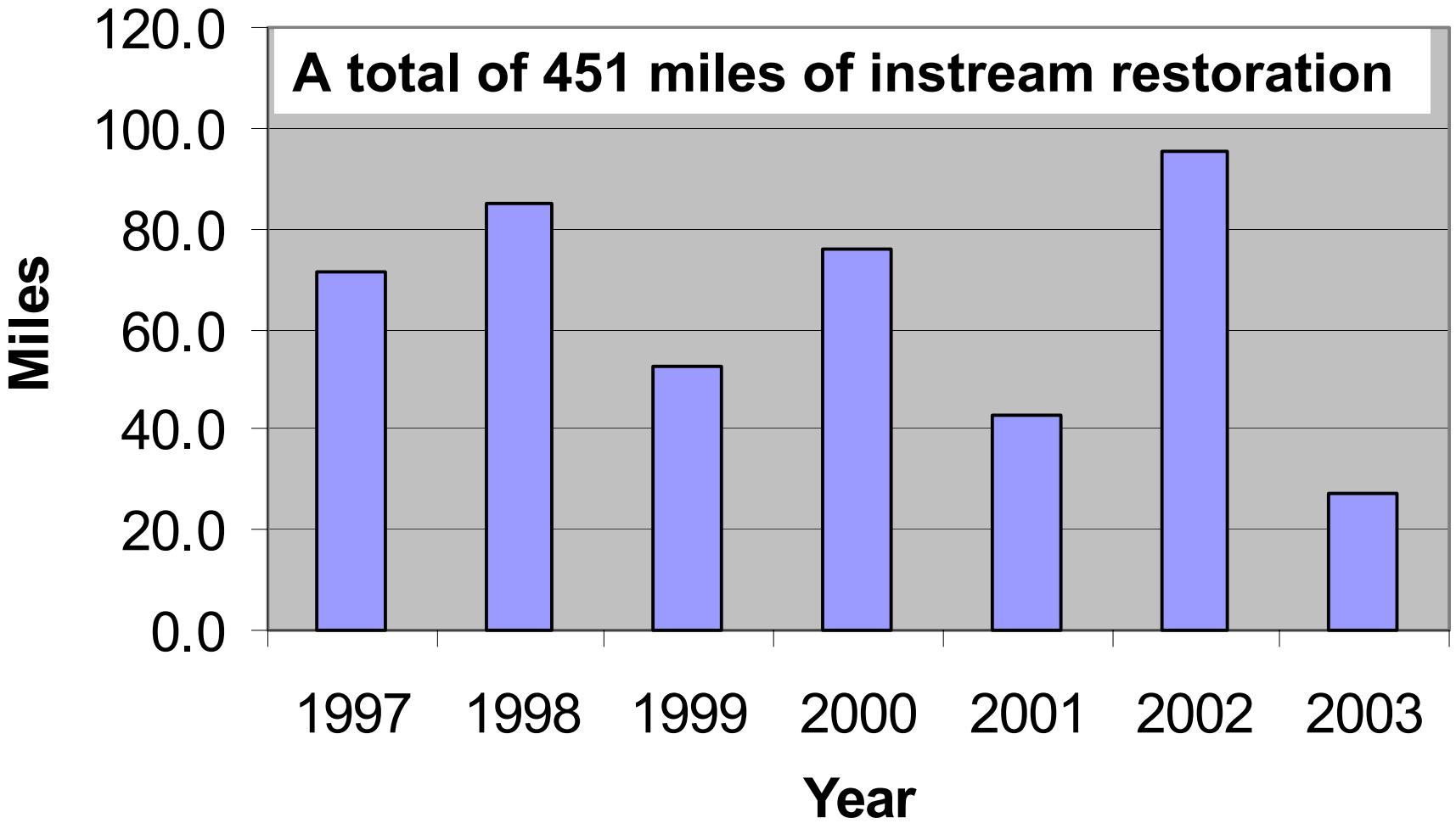
Miles of Instream Habitat Restoration Conducted Each Year

Source – OWEB & Federal Restoration Database



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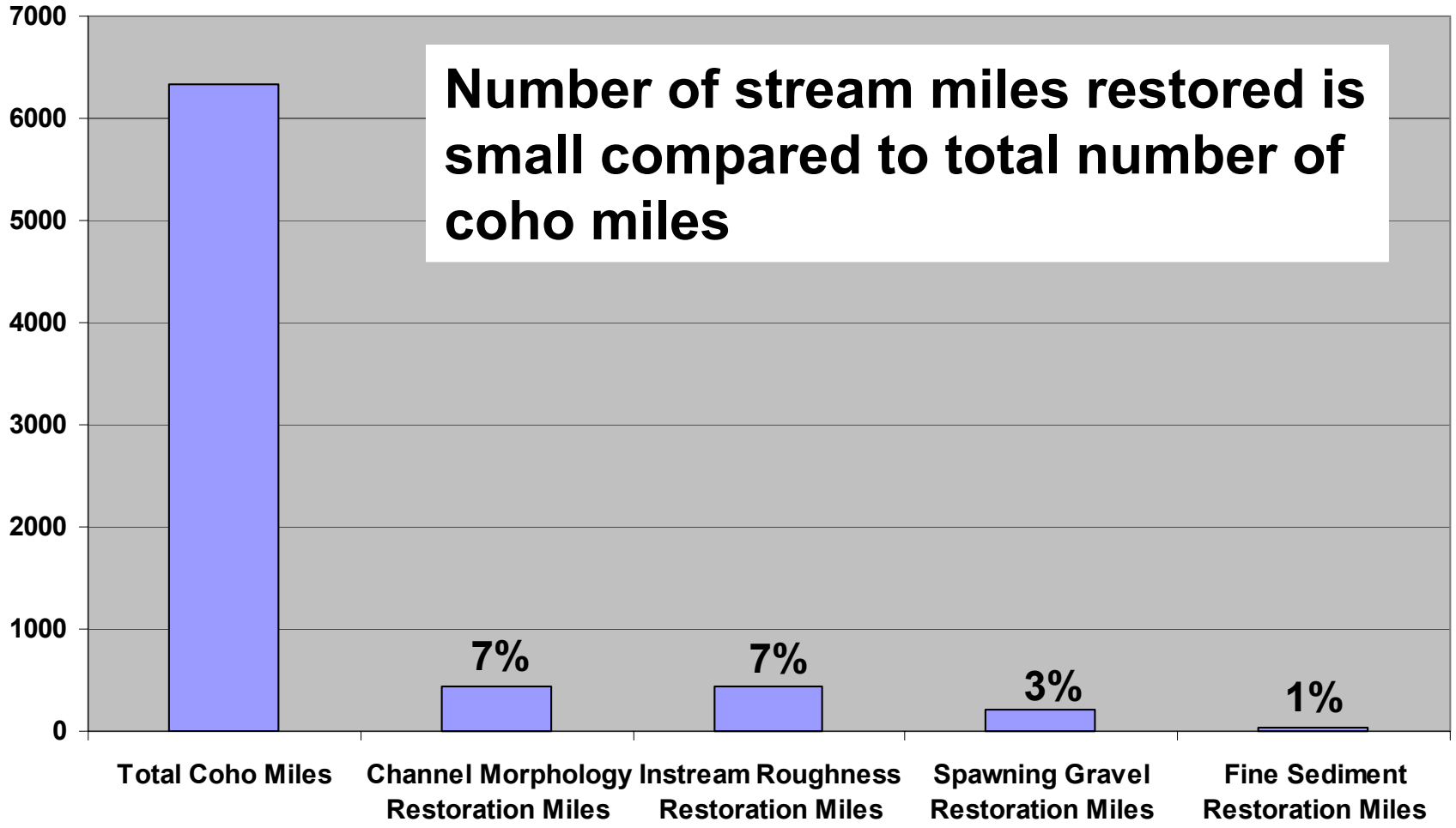
Total Coho Miles and Restoration Miles in the Oregon Coast Coho ESU, 1997 – 2003



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How effective is instream habitat restoration?

- Research has shown that increasing large wood in streams <u>can</u> increase the overwinter survival of juvenile coho salmon and <u>can</u> prevent localized extinctions during poor ocean conditions
- We can't determine the effectiveness of all instream restoration projects, <u>but</u> ODFW does conduct pre- and post-treatment habitat surveys at a subsample of restoration sites.

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Quality of Habitat Restoration Sites Monitored by ODFW

	Spawning Gravel	Instream Roughness				Fine Sediment	Channel Morphology				
Landuse	% Gravel in riffles	Volume LWD	Pieces LWD	Key Pieces LWD	% Bedrock	% Fines in riffles	Deep pools	% SW pools	% Second. channel	% Pools	Channel Morph. Index
Restoration Pre-Treatment (N=72)											
Restoration Post-Treatment (N=72)											

Color Key

- Better Than Reference Conditions
- Similar To Reference Conditions
- Worse Than Reference Conditions

Restoration projects are being successful in increasing large wood abundance in treated reaches to levels equal to or better than reference sites

It will take time for restoration projects to trap sediment and scour deep pools

Fine sediment problems may not be fixed if there are problems upstream

But they are not necessarily working in streams with channel morphology problems

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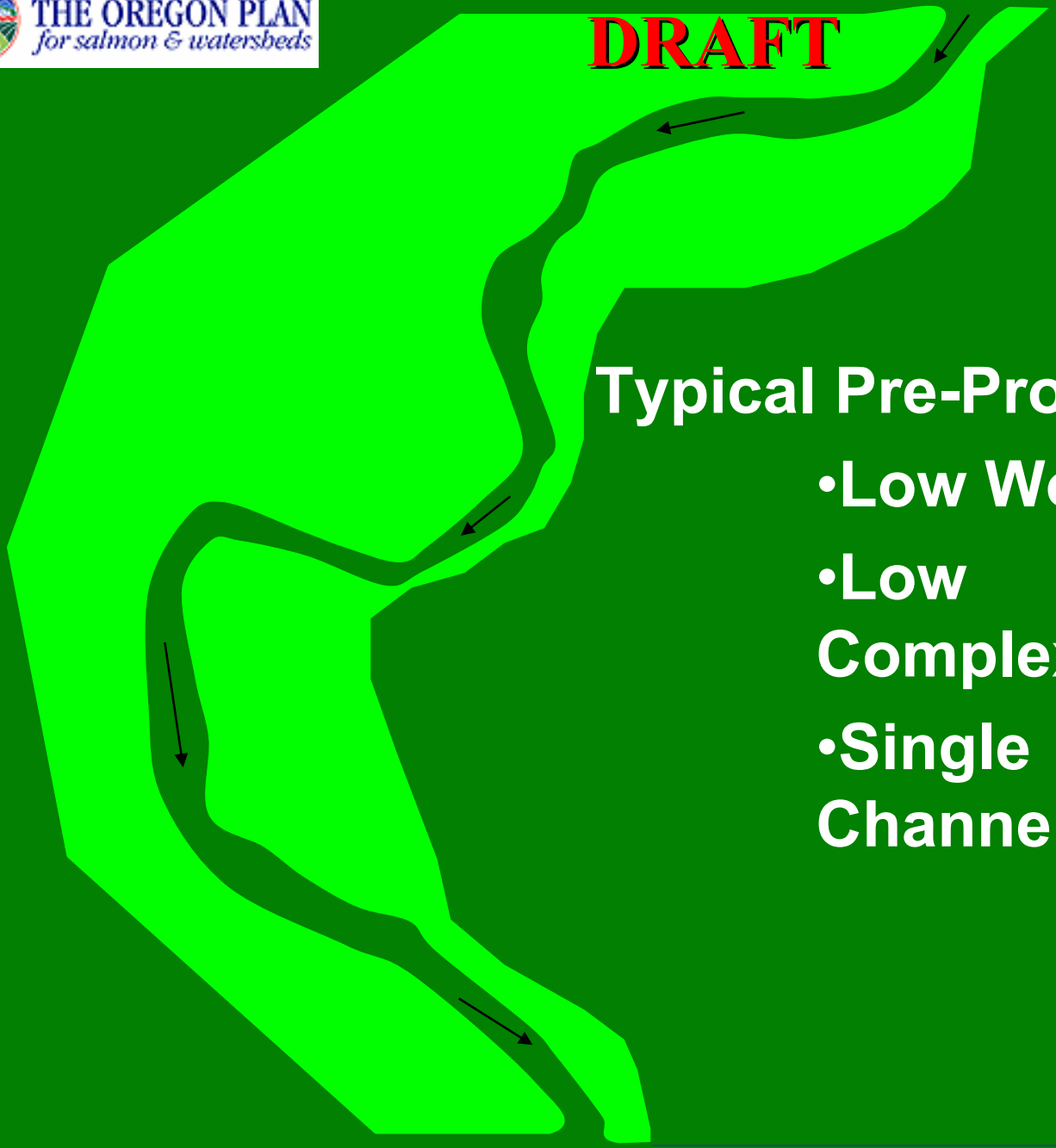

Typical Pre-Project Stream

- Low Wood
- Low Complexity
- Single Channel

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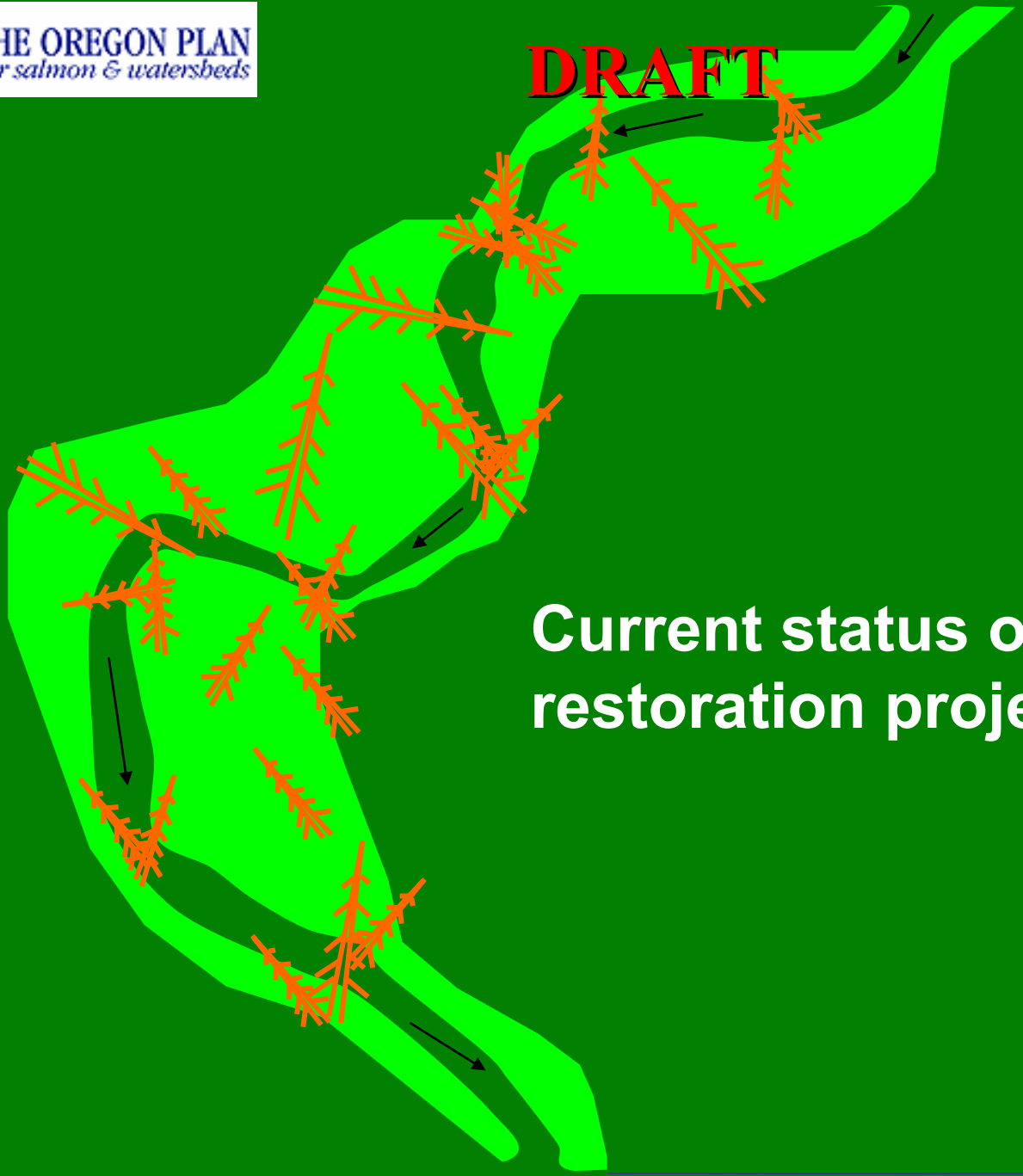

Current status of many restoration projects

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Desired Post-Project Stream

- Increased Wood
- High Complexity
- Multiple Channels

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Where should we focus future restoration efforts?

Low Intrinsic Potential

High gradient, constrained, or high mean annual flow

High Intrinsic Potential

Low gradient, unconstrained, and low to moderate mean annual flow

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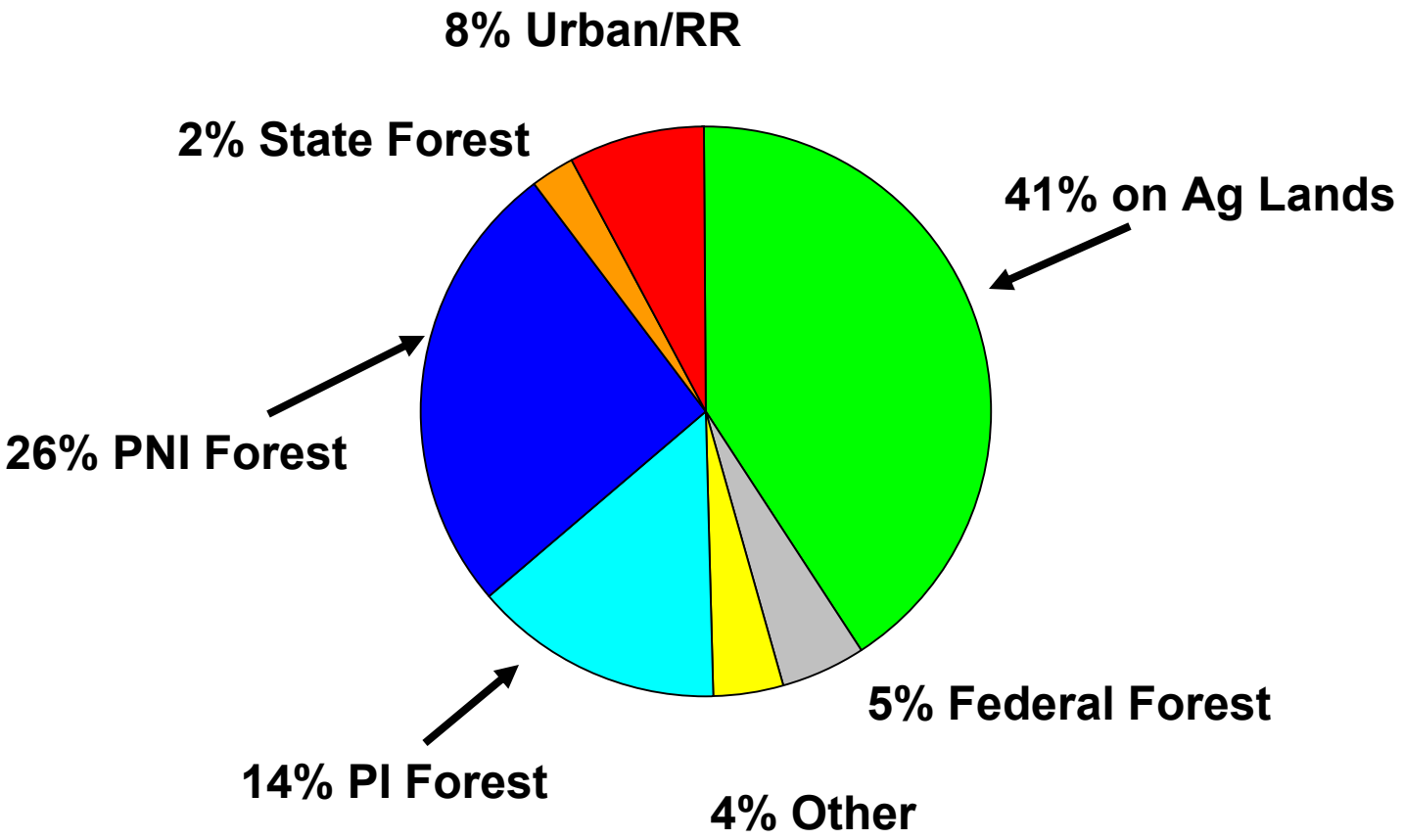
Occurrence of High Intrinsic Potential by Land Use



Intrinsic potential analysis from Coastal Landscape Assessment and Modeling Study (CLAMS)

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Instream Habitat Restoration Conclusions

- **Instream restoration projects are generally successful at improving large wood parameters to conditions found at reference sites**

- **Restoration projects are not addressing channel entrenchment problem**

- **Small proportion of overall coho miles treated makes restoration signal difficult to detect**

- **Many project are not currently creating "high" quality habitat because it takes time for wood placement to trap additional wood, trap substrate, and scour deep pools**

- **Biggest potential for habitat restoration making a difference to coho populations may be on agriculture lands**