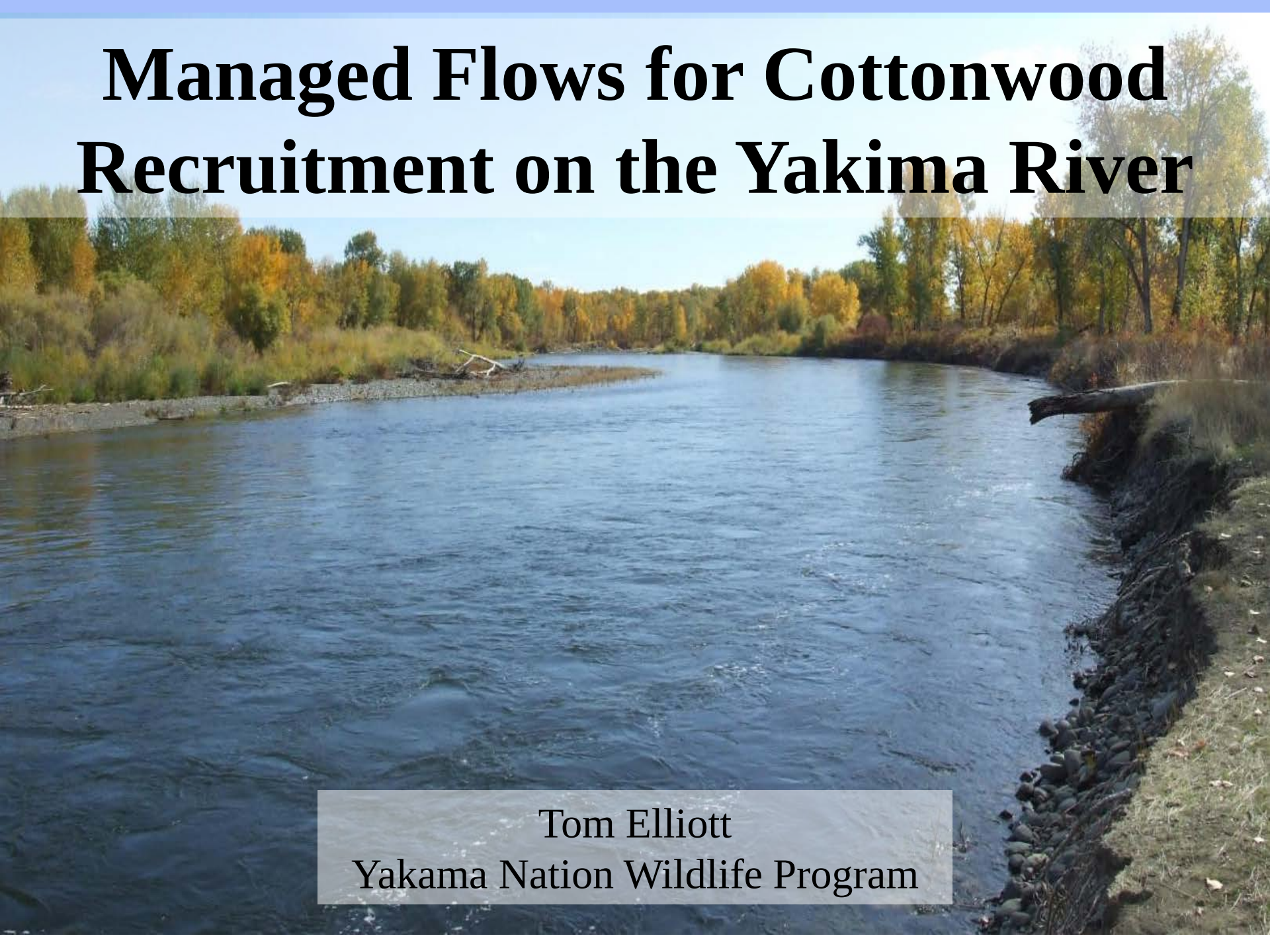
Managed Flows for Cottonwood Recruitment on the Yakima River



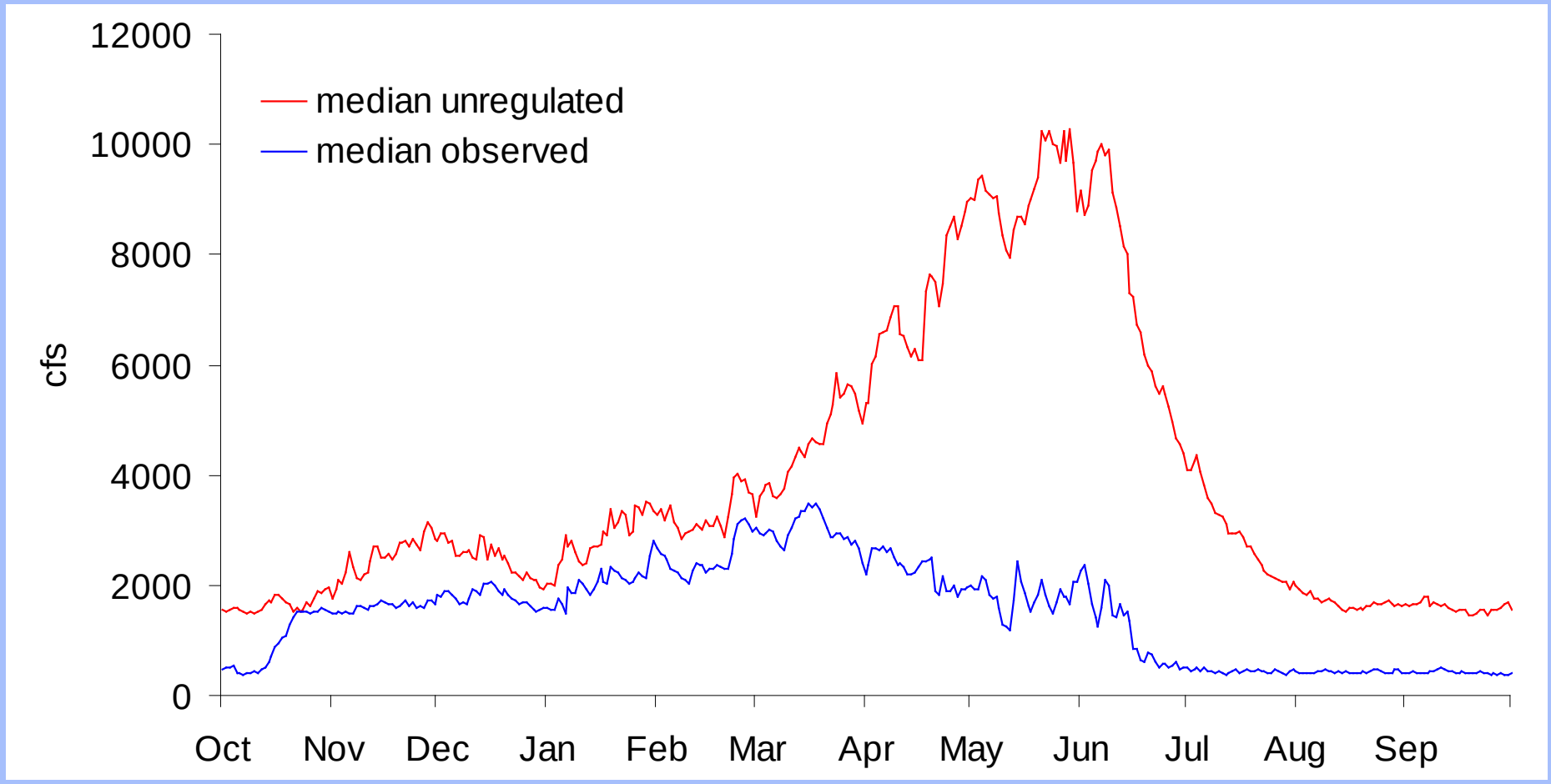
Tom Elliott
Yakama Nation Wildlife Program

Objectives

- Describe why recruitment flows are needed
- Introduce a flow scenario
- Propose an implementation process

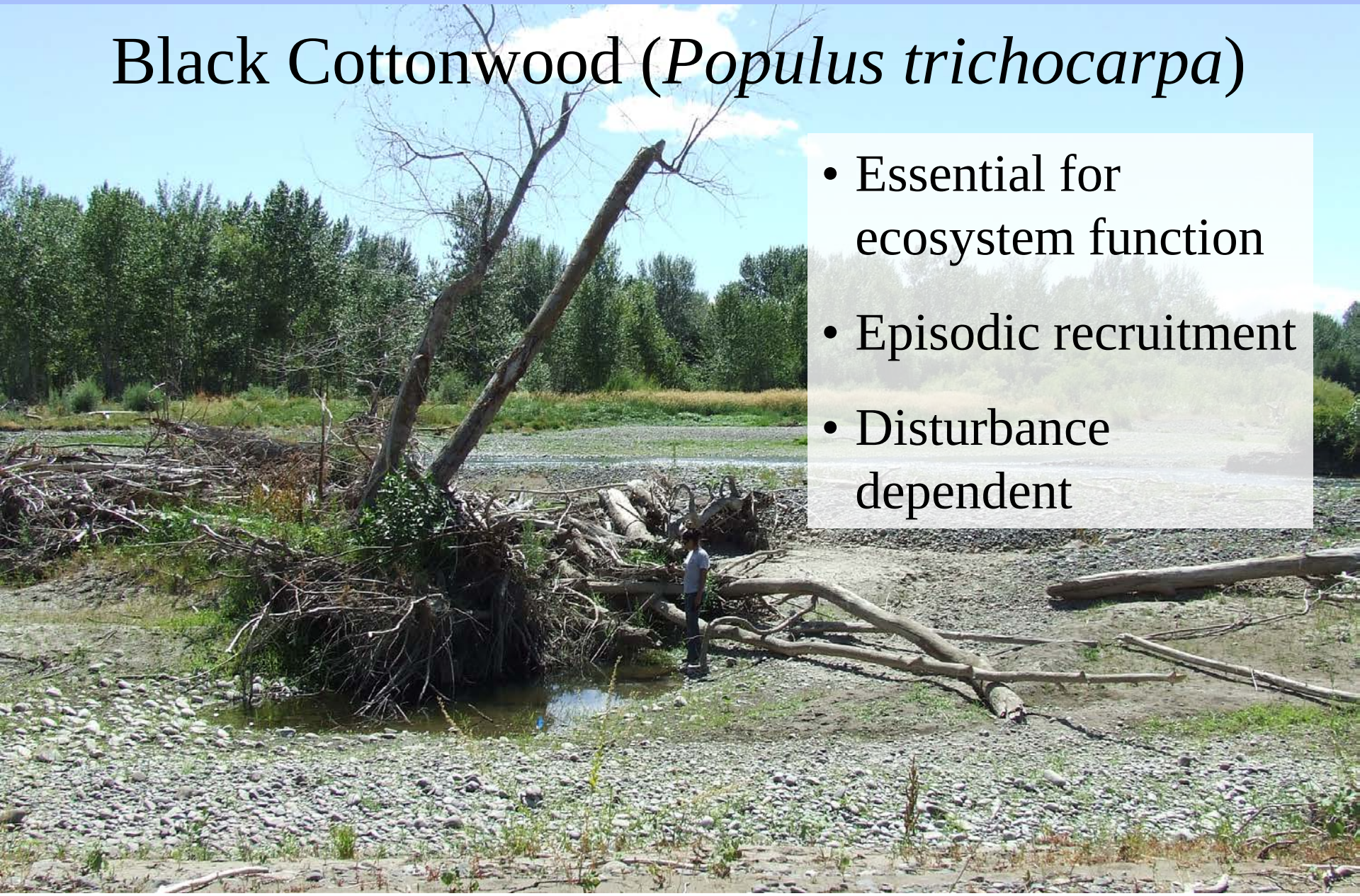

Yakima Basin and Wapato Reach
Cle Elum
Ellensburg
Yakima
Wapato
Toppenish
Yakama Reservation
Richland

Yakima River Flows



Yakima River at Parker, 1981 to 2005, Bureau of Reclamation Hydromet data and Riverware model

Black Cottonwood (*Populus trichocarpa*)



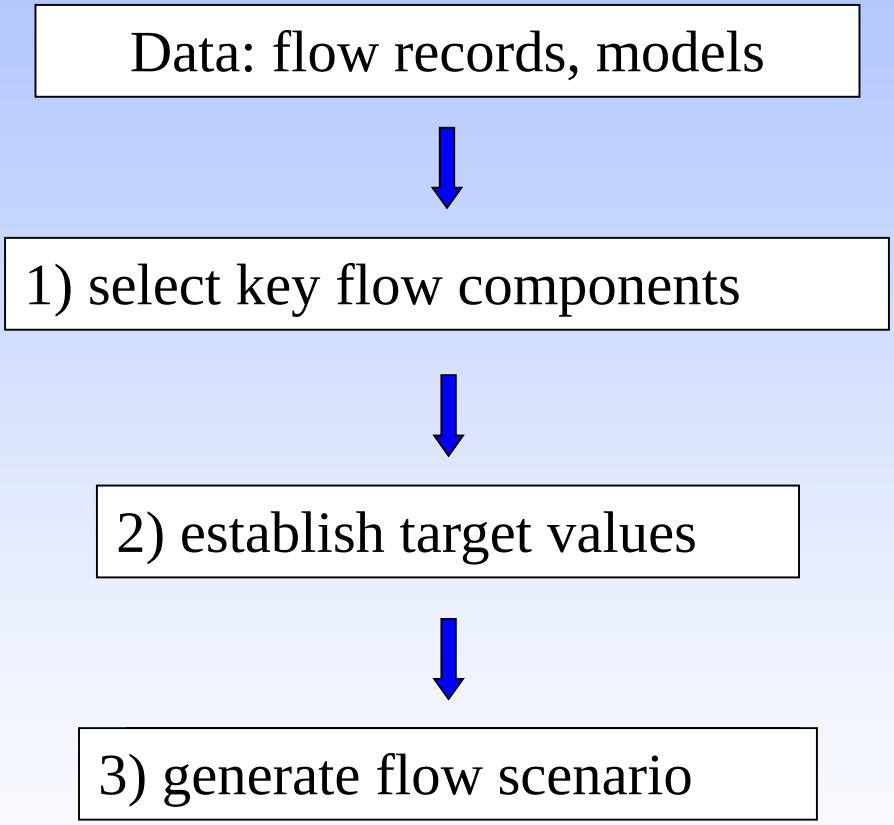
- Essential for ecosystem function
- Episodic recruitment
- Disturbance dependent

Cottonwood Status

- Few young trees and seedlings

(Braatne et al. 2007)

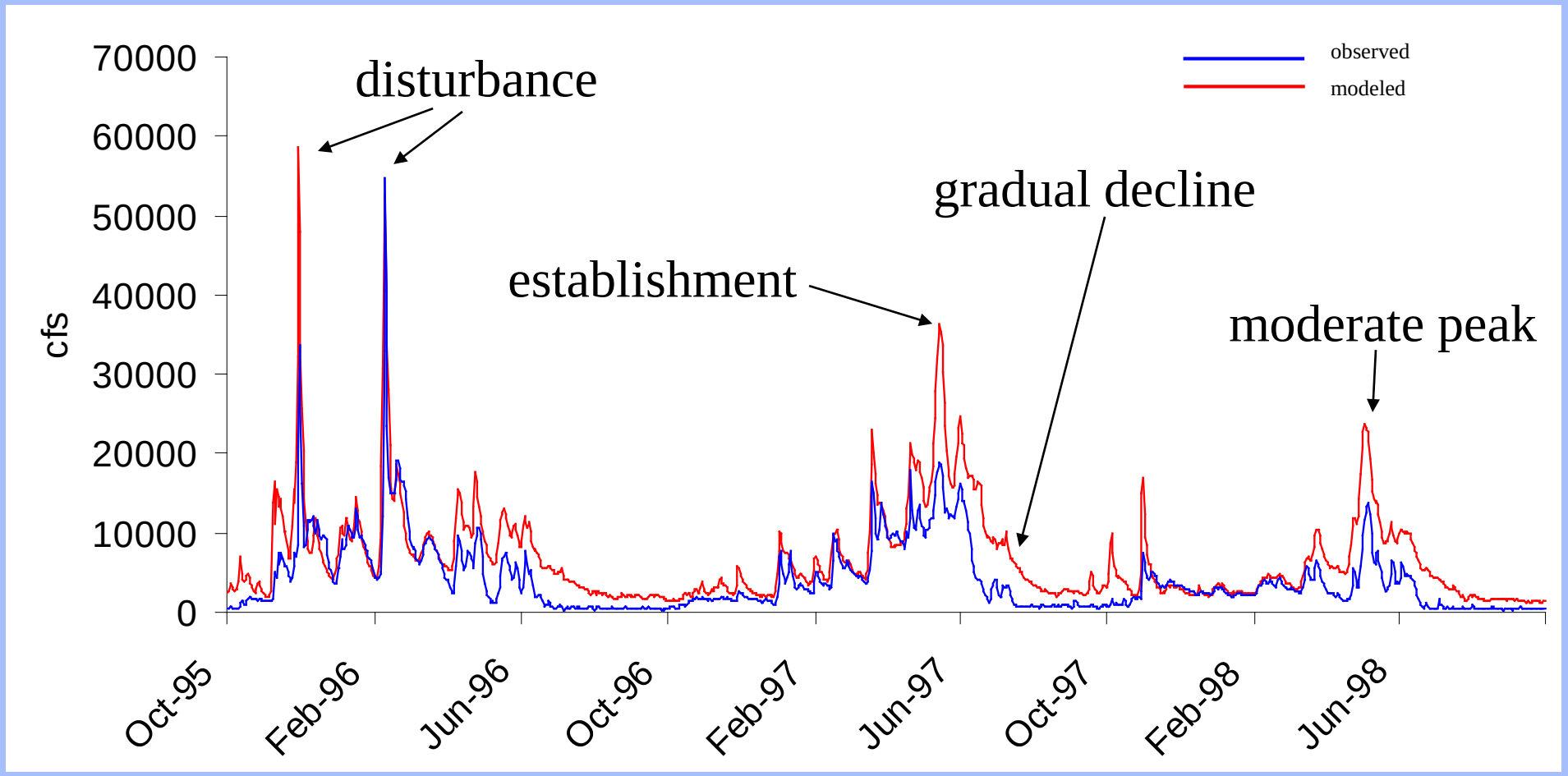
Methods


Data: flow records, models
1) select key flow components
2) establish target values
3) generate flow scenario

Flow Components

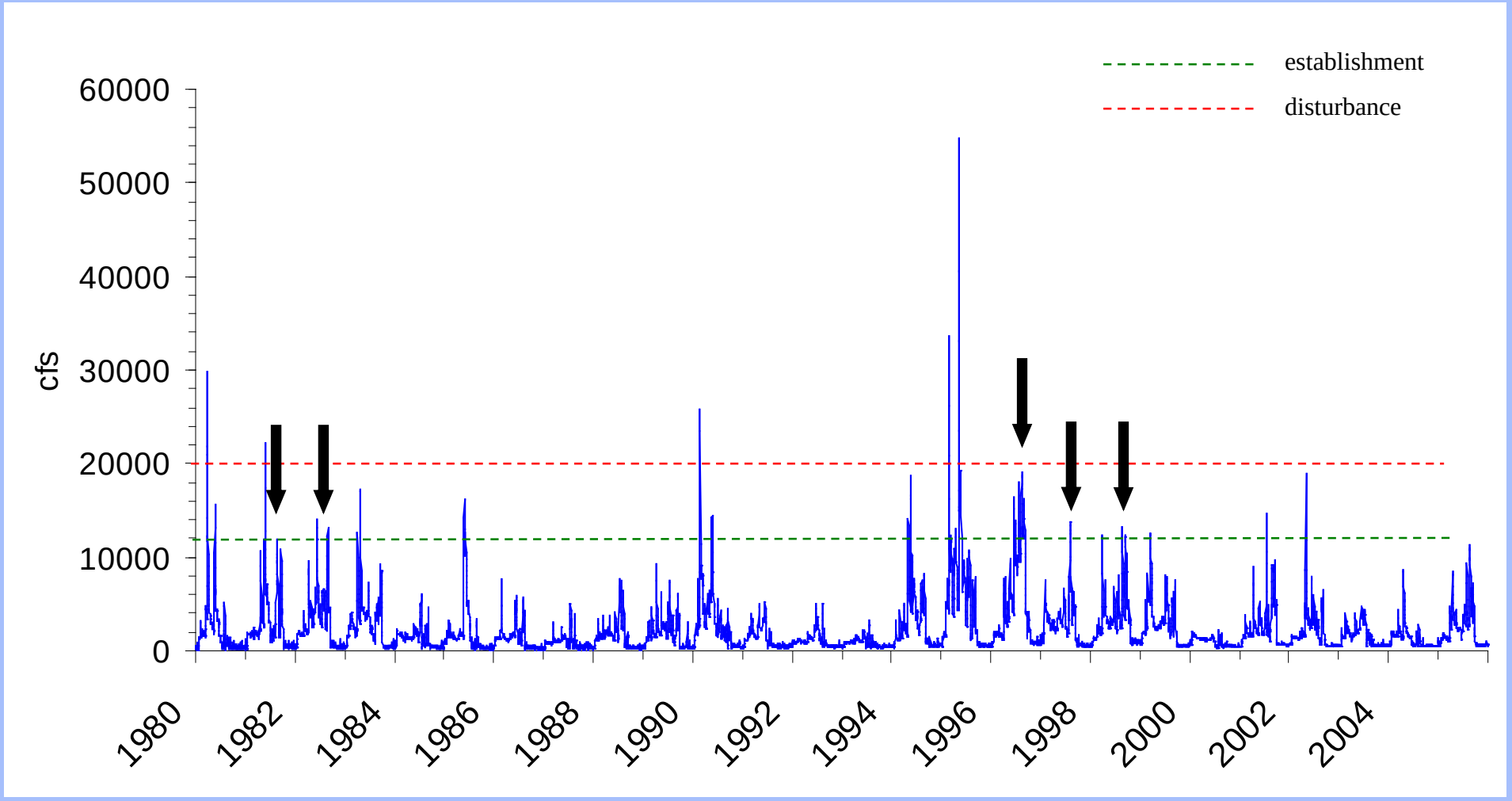
- **Disturbance**: creates bare substrate by scour, deposition
- **Establishment**: peak at ≈ 2 to 6.5 feet above base flow, gradual stage decline, occurs during seed release
- **Maintenance**: moderate fall, winter, and spring peak flows following establishment

Key Flow Components



Observed and modeled unregulated flow at Parker, 1996-1998

Disturbance & Establishment Flows

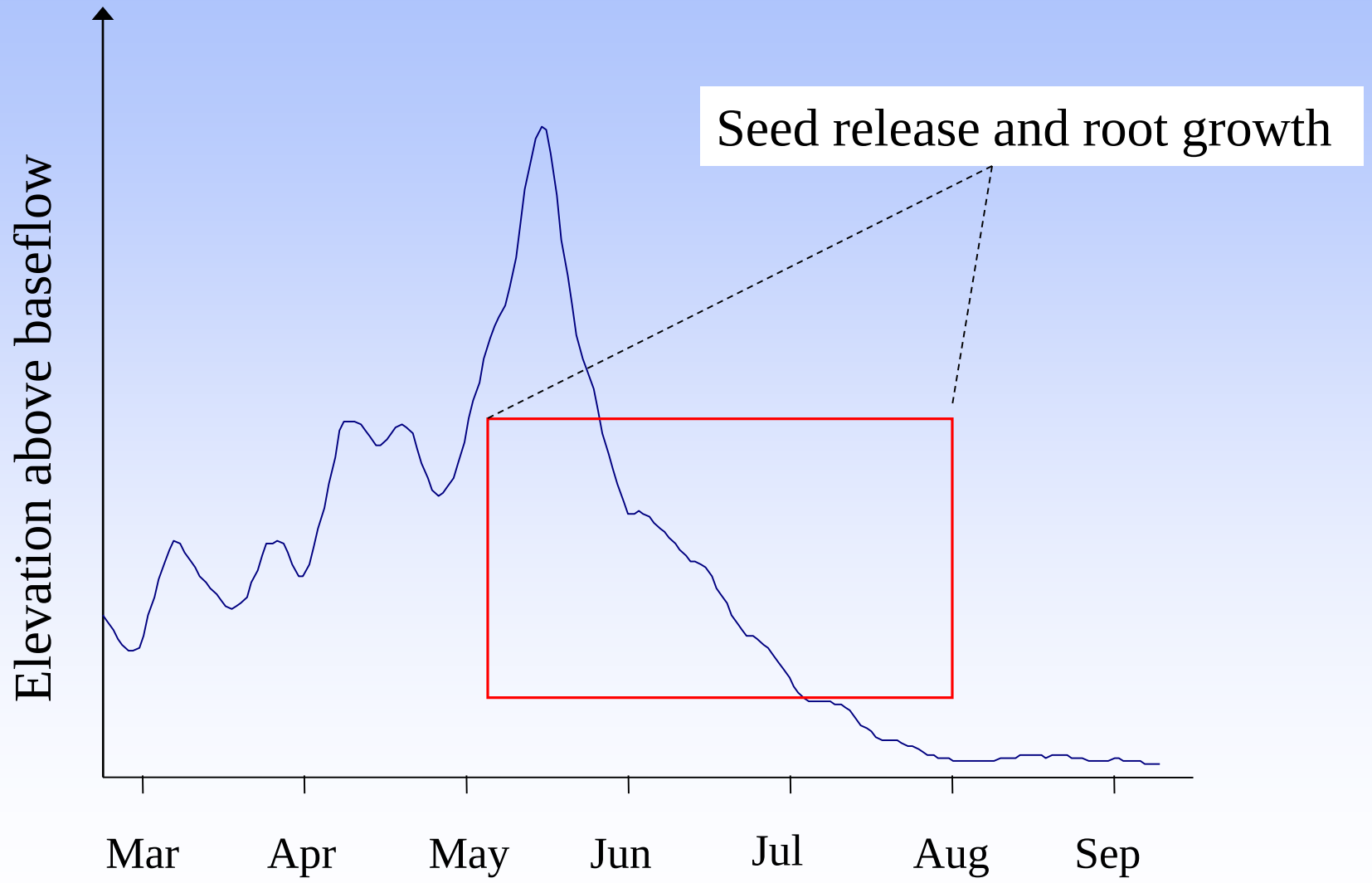


Yakima River at Parker, water years 1981 to 2005

Target Values

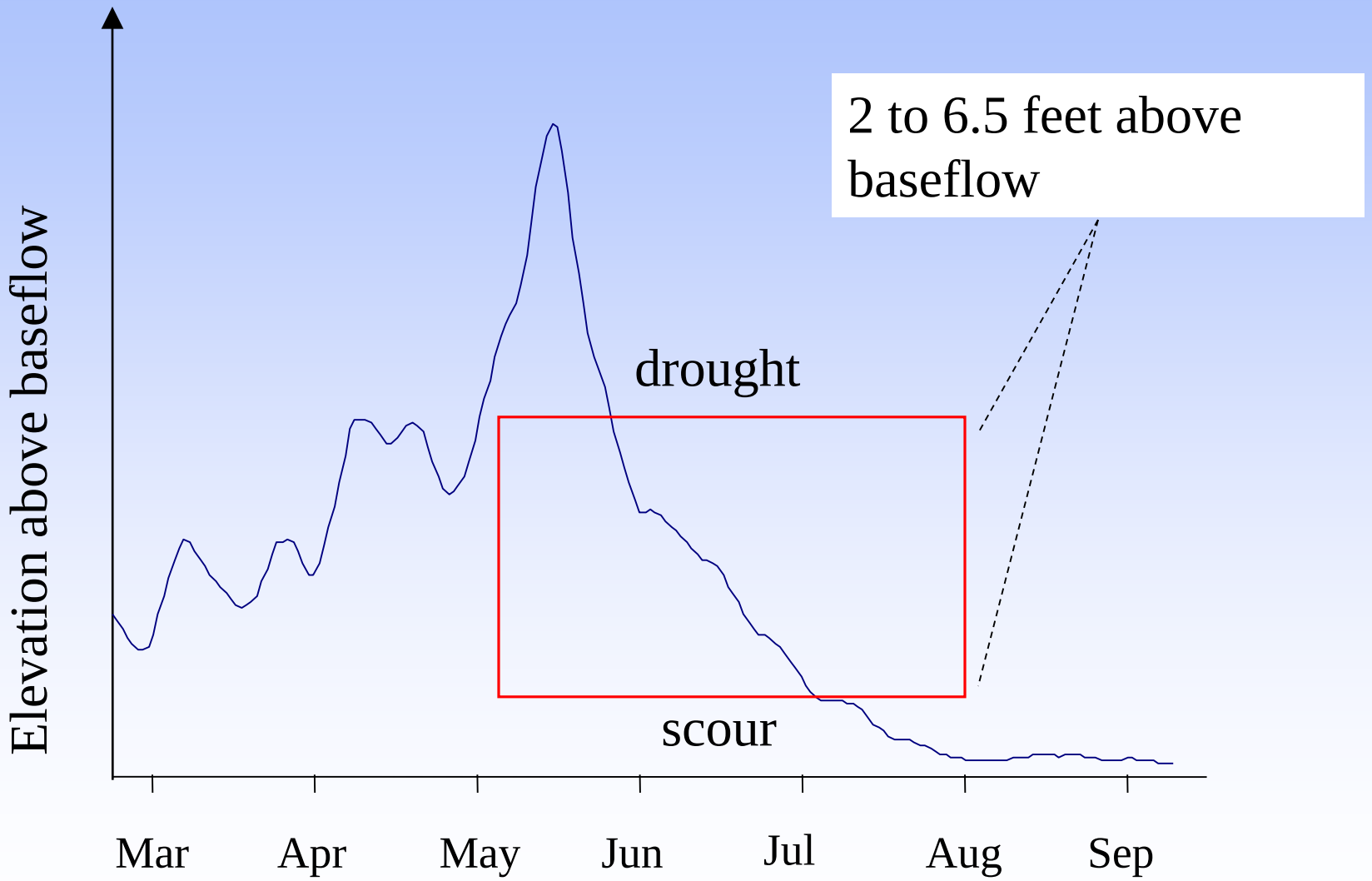
11,000 to 15,000 cfs

Recruitment Box Model



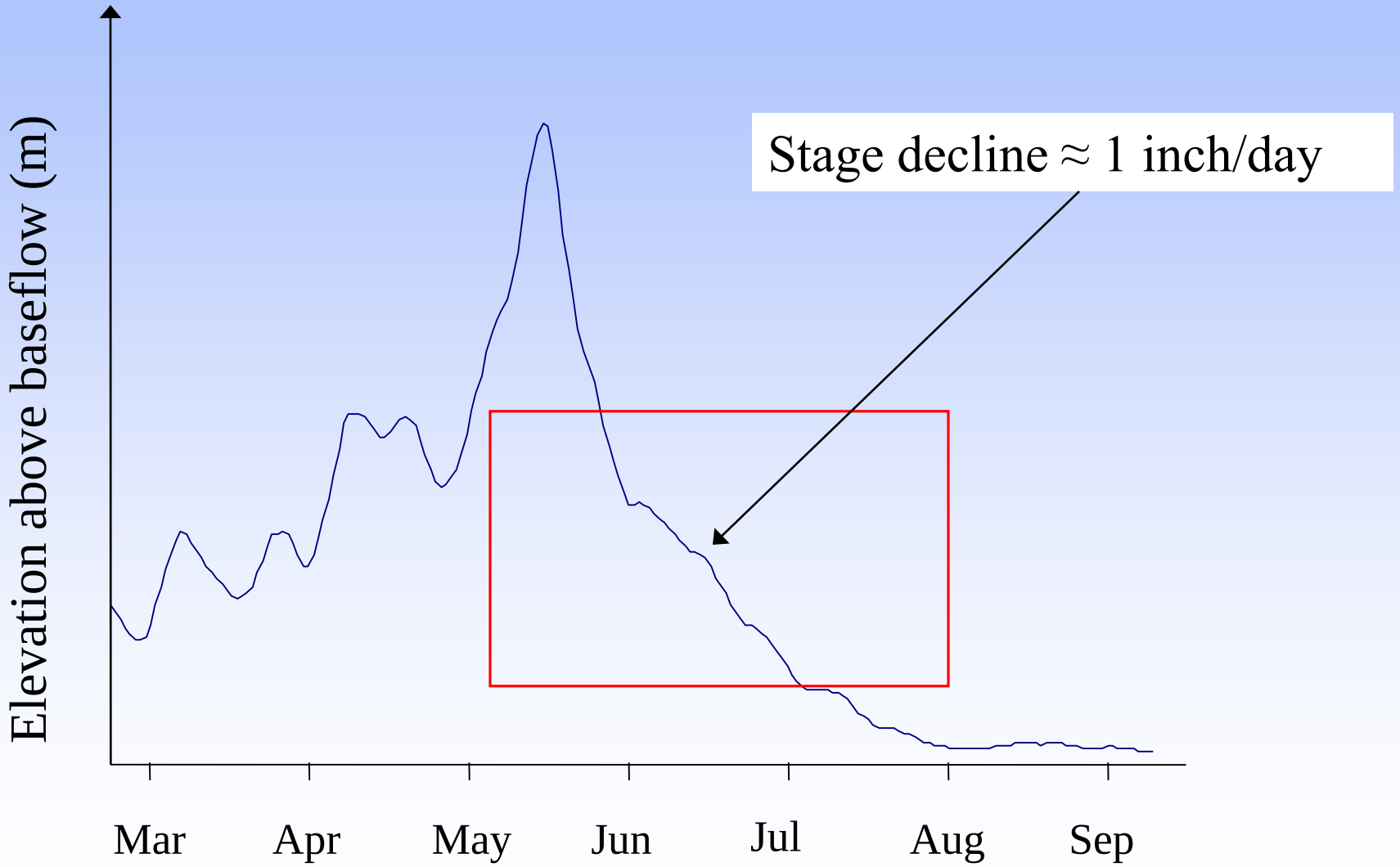
Adapted from Mahoney and Rood 1998

Recruitment Box Model



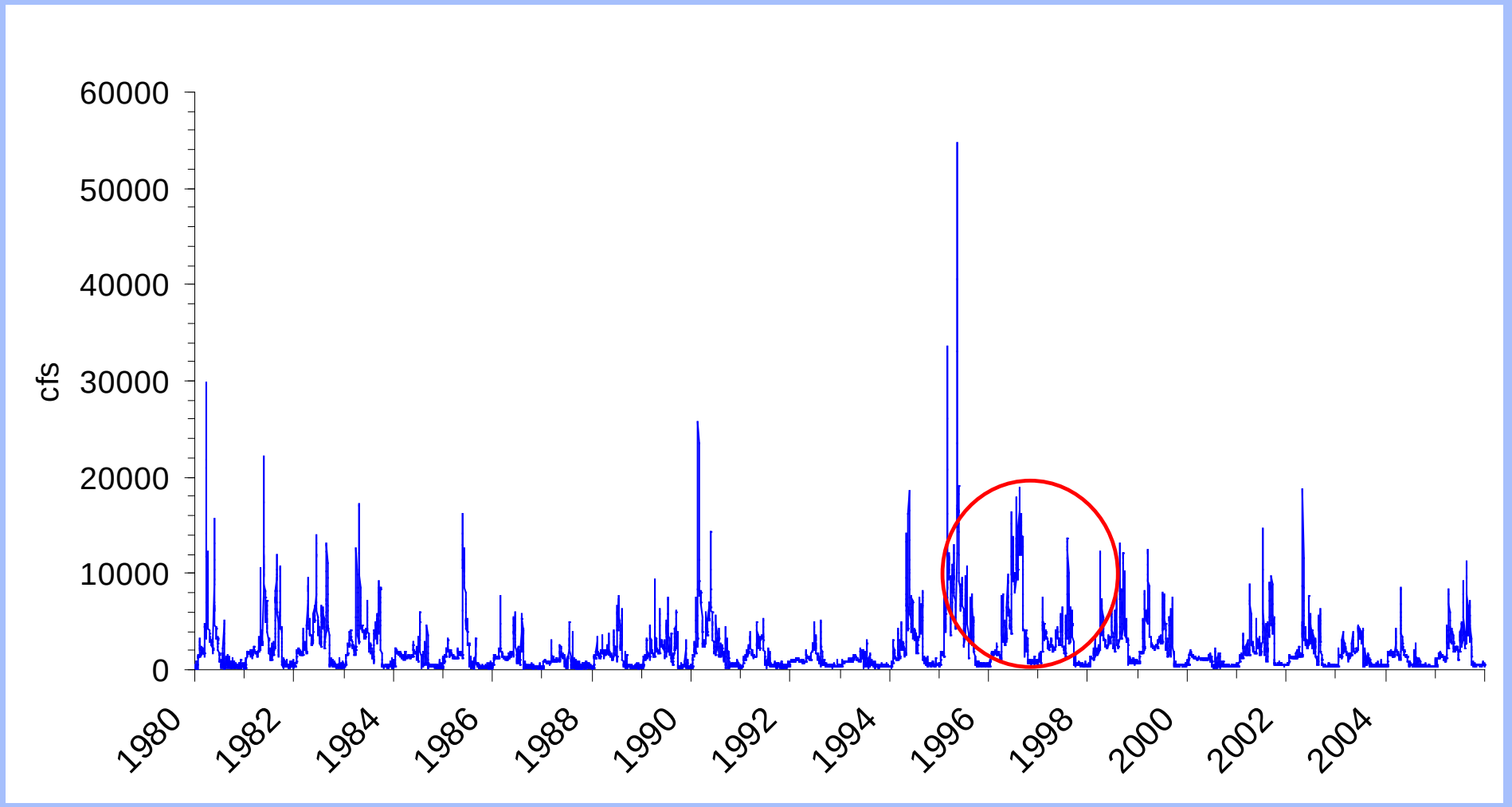
Adapted from Mahoney and Rood 1998

Recruitment Box Model



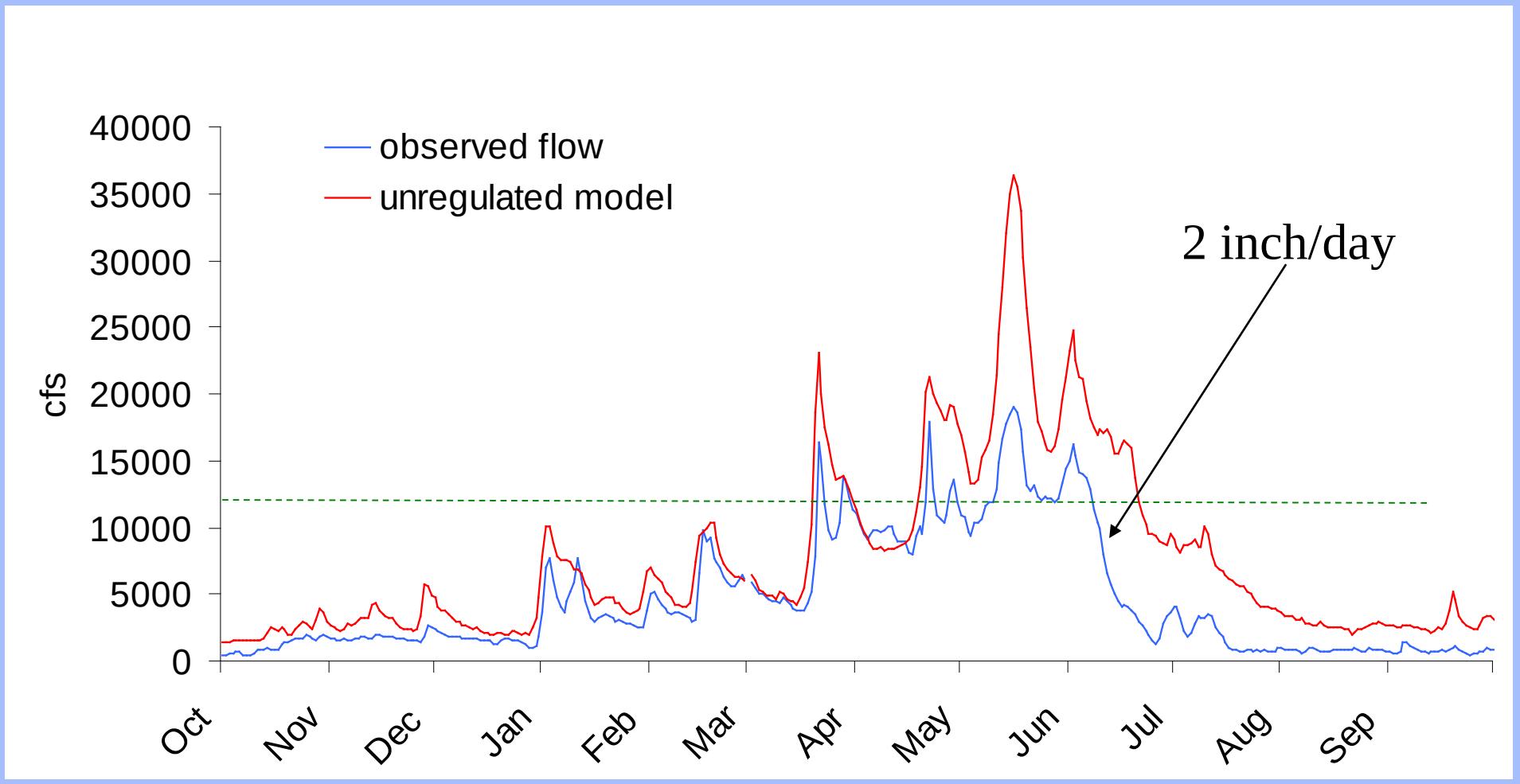
Adapted from Mahoney and Rood 1998

Spring of 1997



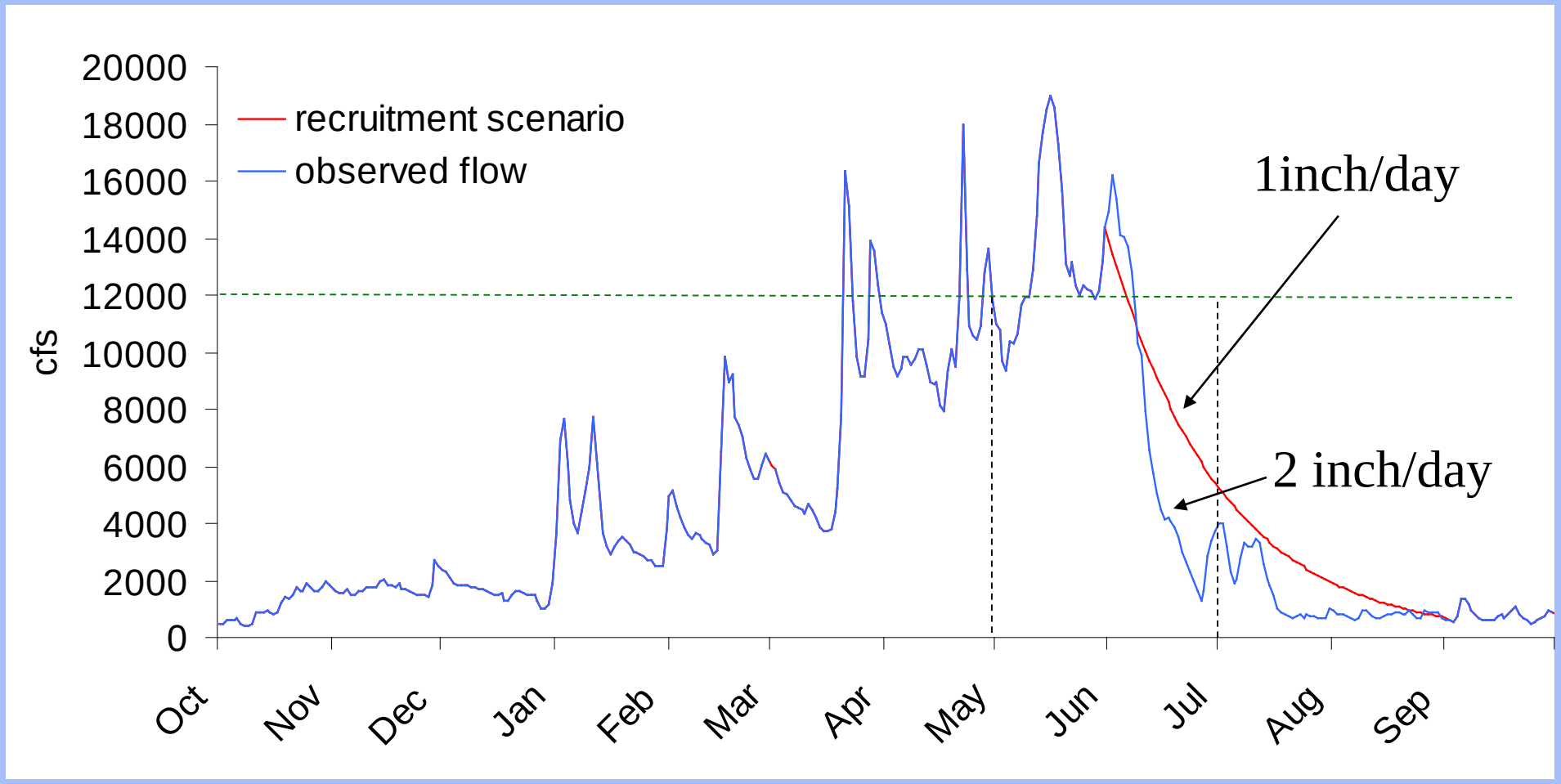
Yakima River at Parker, water years 1981 to 2005

Snowmelt Peak and Stage Decline



Yakima River at Parker, water year 1997

Cottonwood Establishment Flow Scenario



Yakima River at Parker, 1997

Implementation Approach

- Snow pack and storage thresholds trigger the process
- Progressive decision points March through June
- Modeling of impacts to water supply
- Decision point in late May or June

Keys for Implementation

- planned, opportunistic approach
- stakeholder consensus
- maintain momentum from ongoing projects
- adaptive management

Questions?

Acknowledgements

- Tracy Hames
- Katrina Strathmann
- Arlen Washines