Workshop
Upper Elk River TMDL and Waste Discharge Requirement Update

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Item 1
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CALIFORNIA Water Boards

Workshop Overview

- Regional Water Board staff
- Large Forestland Owners:
  - HRC, GDRC, and BLM
- Residents
- Resource Agencies and Other Interested Stakeholders
- Regional Water Board-led discussion

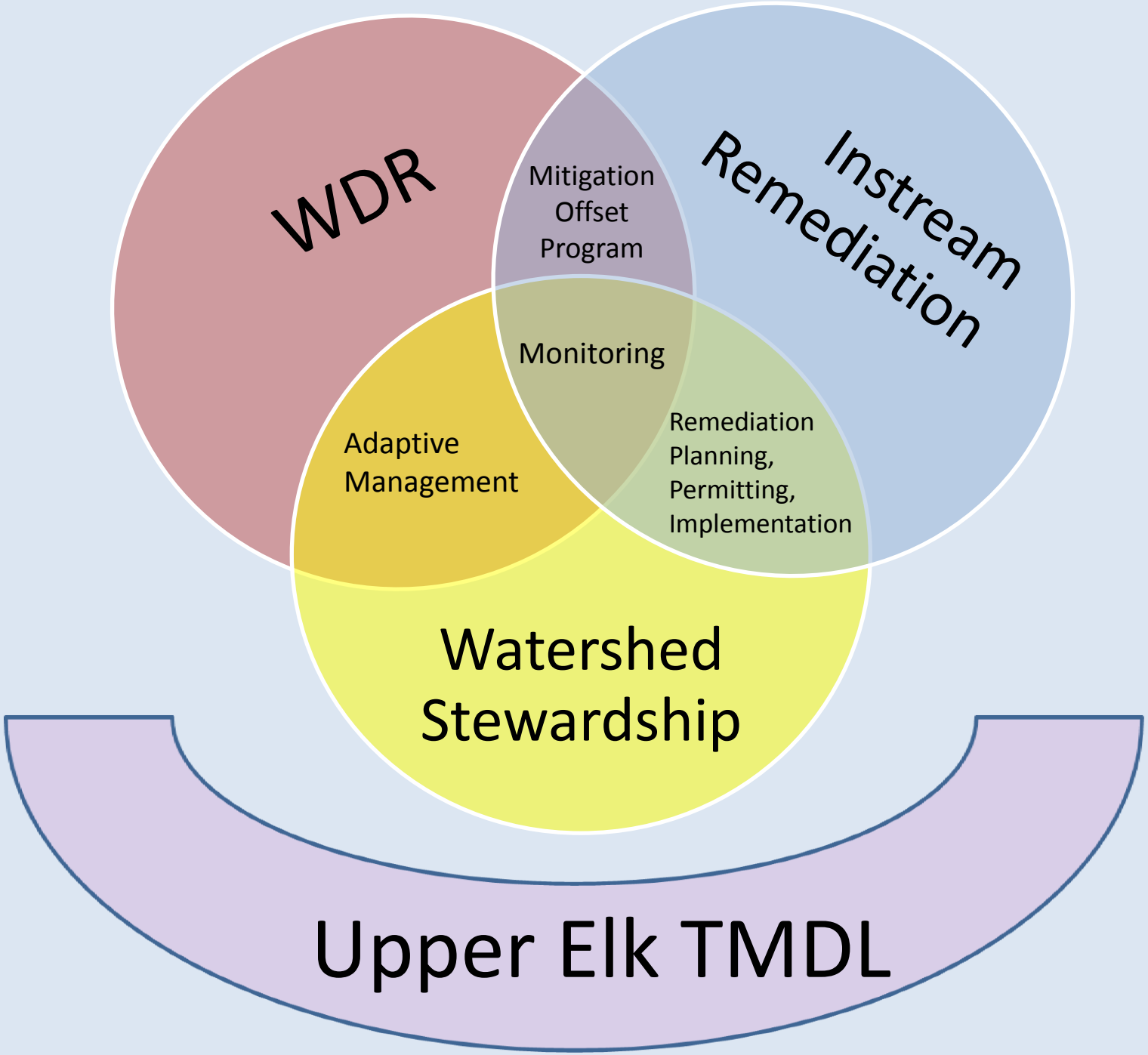
Workshop Goal

To engage the Regional Water Board, responsible parties, and other stakeholders in a discussion regarding several key policy issues so as:

1. To help inform the completion of the Total Maximum Daily Load (TMDL) and revised Waste Discharge Requirement (WDR) for the Upper Elk River watershed
2. Assure a program capable of returning the system to a trajectory of recovery

Presentation Outline

- Describe key policy controls
- Identify range of control options
- Describe our current regulatory program
- Describe the controls contained in draft TMDL
  - Highlight stakeholder comments on the supporting science and potential revisions to the report
- Describe staff's proposed TMDL program of implementation: revised WDR and Watershed Stewardship framework
- Highlight some legal considerations


WDR
Instream Remediation
Mitigation Offset Program
Monitoring
Adaptive Management
Remediation Planning, Permitting, Implementation
Watershed Stewardship
Upper Elk TMDL

Policy Controls

1. Instream Sediment Remediation
2. Sediment Source Control
   a. Rate of Harvest Limitations
   b. Protection of Sensitive Areas

Balancing the controls to optimize risk management goals

Instream Sediment Remediation

- Assimilative capacity for excess sediment consumed by instream stored sediment
- Remediation necessary to:
  - return system to a trajectory of recovery
  - eliminate nuisance conditions
  - achieve TMDL
- Complex and expensive activity requiring substantial public and private investment
- Elk River Recovery Assessment underway this summer; Remediation at least 5 years off

Instream Sediment Remediation

Current range of options to fund this work

- Require private contributions
  - Cleanup and Abatement Order
- Compel private contributions
  - Progressive rate of harvest limitation
  - Mitigation offset program
- Invite voluntary contributions

Sediment Source Control

- Little-to-no assimilative capacity for additional sediment discharges
- Elk River specific management plans in effect; aggradation continues
- Sediment source control only tool available to manage risk to residents prior to instream sediment remediation
- Protection of sensitive areas includes: headwater catchments, steep slopes, unstable geology and riparian areas
- Rate of harvest addresses: peak flows, harvest-related landsliding, and cumulative effects

Protection of Sensitive Areas

Current Range of Options

- Forest Practice Rules
- Habitat Conservation Plans
- Elk River specific management plans
  - HRC Watershed Analysis
  - GDRC South Fork Elk Management Plan
- TMDL targets
- Discharge prohibition in sensitive areas

Rate of Harvest

Current range of options
(based on clearcut equivalent acres as an annual rate of harvest)

- no limit
- 3.9% - GDRC existing cap
- 1.9% - HRC existing cap
- 1.5% - draft TMDL target
- 0 % - Palco harvest ban

Balancing the controls to optimize risk management goals

- In the short term:
  - Raise funds to initiate instream sediment remediation as soon as possible
  - Decrease sediment loading as soon as possible to reverse aggradation and reduce risk to downstream residents
- In the long term:
  - Restore beneficial uses
  - Abate nuisance
  - Return the system to a trajectory of recovery
  - Cultivate long-lasting watershed stewardship

Timberlands in Upper Elk River Existing Discharge Control Program

Humboldt Redwood Company (HRC)

~ 22,200 acres

Green Diamond Resource Co (GDRC)

~ 1,900 acres

Non-industrial Timberlands (NTMP)

~ 201 acres

Bureau of Land Management (BLM)

~3,700 acres

Humboldt Redwood Company Existing WDRs and CAOs

- Water Supply

  R1-1998-0100 Water Supplies North Fork Residents

- CAOs

  R1-2004-0028 (South Fork and Mainstem)

  R1-2006-0055 (North Fork)

- Watershed-wide WDRs

  R1-2006-0039 (WDR and Monitoring and Reporting Program)

  R1-2008-0071 HRC “Tier 2” MRP

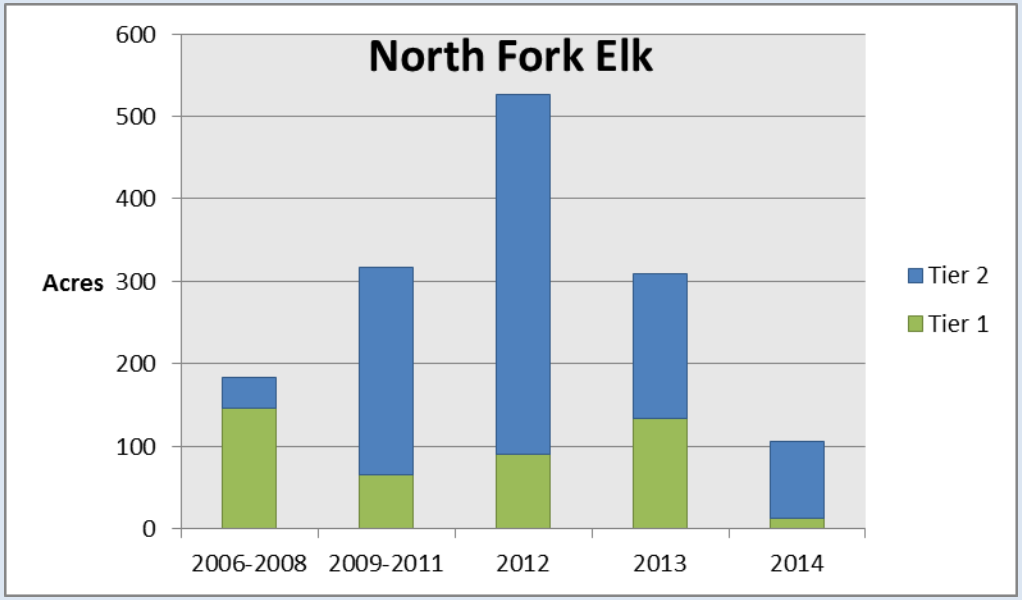
HRC WDR
Annual Rate of Harvest (ROH) Limits

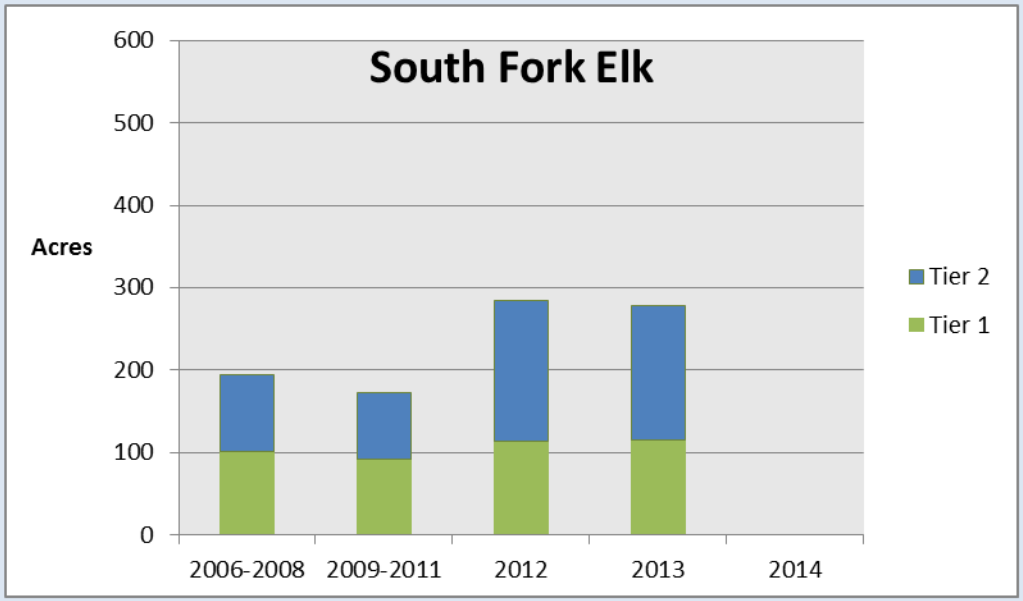
- ROH based on landslide reduction and peak flow models:

	Landslide Low/High Hazard acres (percent ownership)	Peak Flow cce acres (percent ownership)
NF Elk	266/21 (1.9/0.15%)	264 (1.9%)
SF Elk	114 total (1.7%)	No Limit

- Allows additional "Tier 2" harvesting
- No discharge from harvest related landslides

HRC Annual Harvest 2006-2014





Green Diamond Resource Company Existing WDR

- Roads (R1-2010-0044)
- Forest management (R1-2012-0087)
- Monitoring and reporting (R1-2012-0088)
- South Fork Elk River Management Plan:
  - 75 acres annual ROH
  - Riparian protection
  - Geological protection
  - Harvesting, Yarding, and Hauling
  - Road management
  - Seasonal Restrictions

Sediment Control and Monitoring

- Erosion Control Plans (ECPs)
- Road upgrading and decommissioning
- Storm/earthquake triggered landslide inspections
- Annual Tier 2 harvest landslide inspection
- Annual work plans and summary reports
- Water quality monitoring

Non-Industrial Timberlands General NTMP WDR

- Four NTMPs in Upper Elk River
- ~200 total acres
- General NTMP WDR R1-2013-0005
  - ECPs and annual inspections
  - Uneven-aged management
  - Sustained Yield

What’s Next?

Sediment Cleanup CAOs
R1-2004-0028 South Fork and Mainstem Elk
R1-2006-0055 North Fork Elk

Objectives:

- Provide mechanism to treat sediment sites based on watershed needs
- Complete inventories of threated discharges at hillslope sediment sites
- Provide a monitoring and reporting program to assess implementation and effectiveness

CAO Components

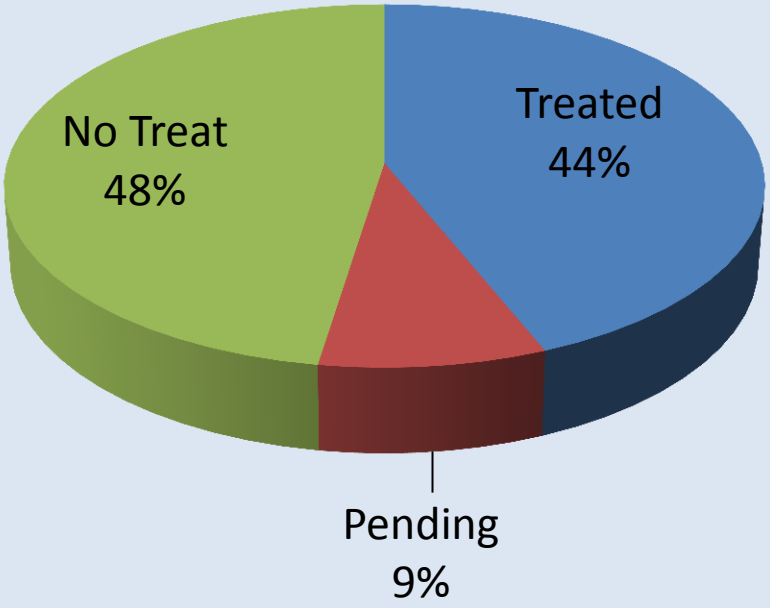
- Inventory of all Sediment Sites throughout the watersheds
  - Sediment Reduction Plan and Prioritization
  - Master Treatment Schedule for Controllable Sediment Discharge Sites
  - Annual Implementation Work Plans
- Monitoring and Reporting
  - Implementation audit; Wet Weather Inspections and Discharge Notifications; Void Erosion Estimates
  - Monthly Status Reports; and Annual Summary and Monitoring Reports

Status of Elk River Site Treatments 2006-2013

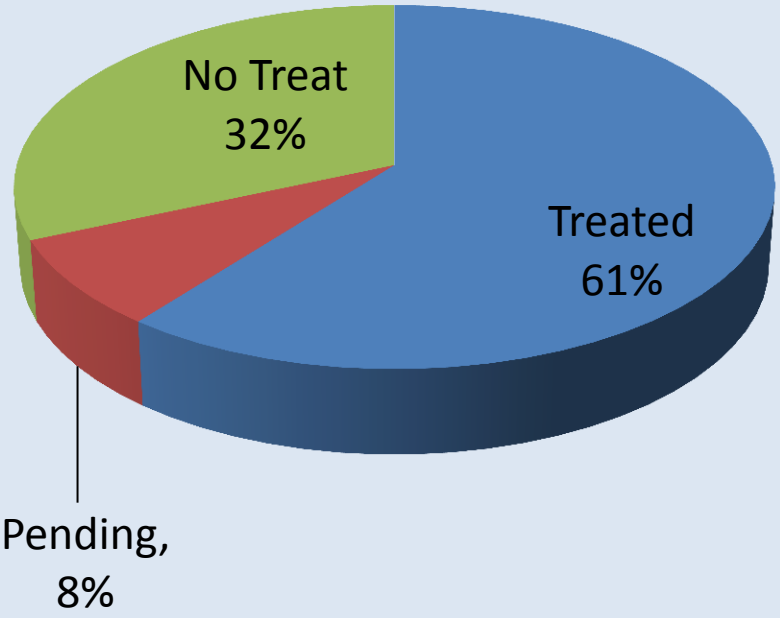
Watershed	South Fork & Mainstem Elk		North Fork Elk	
	# Sites % of Total	Volume (yd^3) % of Total	# Sites % of Total	Volume (yd^3) % of Total
Total	951 sites	132,400	1619	426,900
Treated 2006-2013	394 sites 41%	80,200 61%	733 sites 45%	258,200 61%
Pending Phase II	118 sites 12%	22,000 17%	103 sites 6%	22,500 5%
No Treat	439 sites 46%	30,200 22%	782 sites 48%	146,200 34%

Status of Elk River Site Treatments 2006-2013

Elk River Total Number Sites

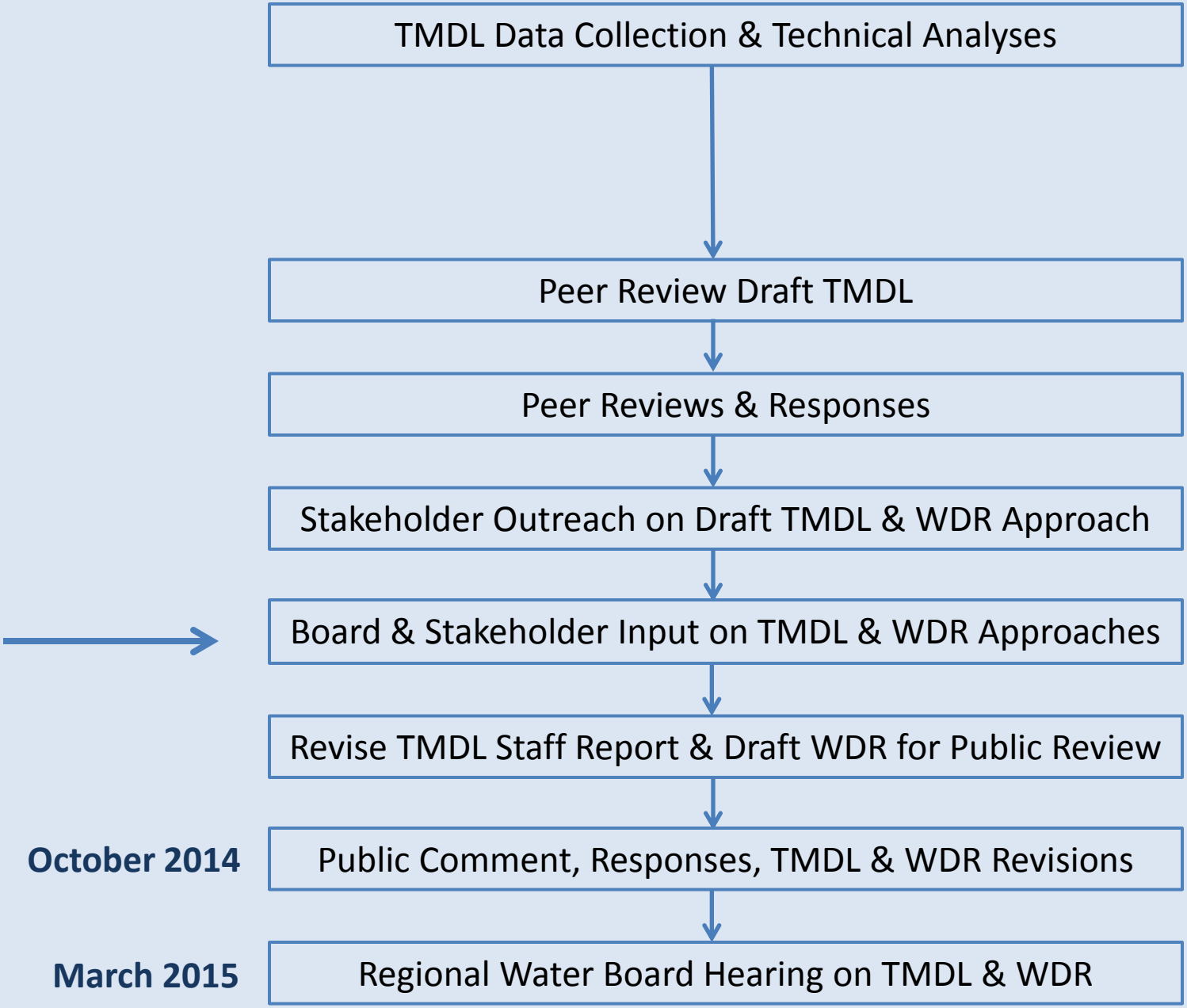


Elk River Combined Volumes



Accomplishments & Lessons Learned

- Prioritization of site treatment based on watershed needs
- Over all, relatively few sites have had major problems
  - Tom Gulch
  - Lake Creek “Big Digs”
  - Often sites need more wood placement to decrease off-site sediment discharges


TMDL Data Collection & Technical Analyses
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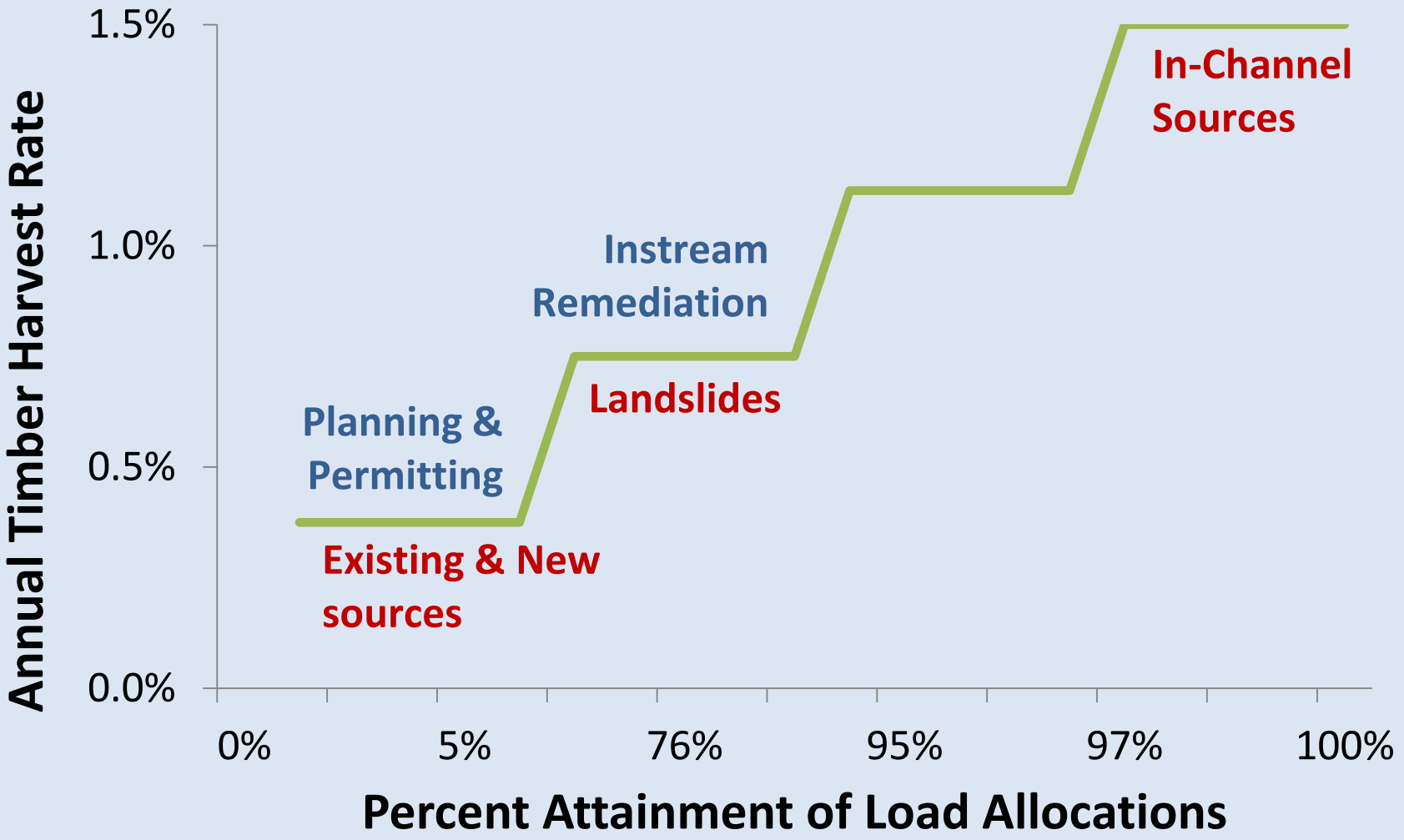
Peer Reviews & Responses
Stakeholder Outreach on Draft TMDL & WDR Approach
Board & Stakeholder Input on TMDL & WDR Approaches
Revise TMDL Staff Report & Draft WDR for Public Review
October 2014
Public Comment, Responses, TMDL & WDR Revisions
March 2015
Regional Water Board Hearing on TMDL & WDR

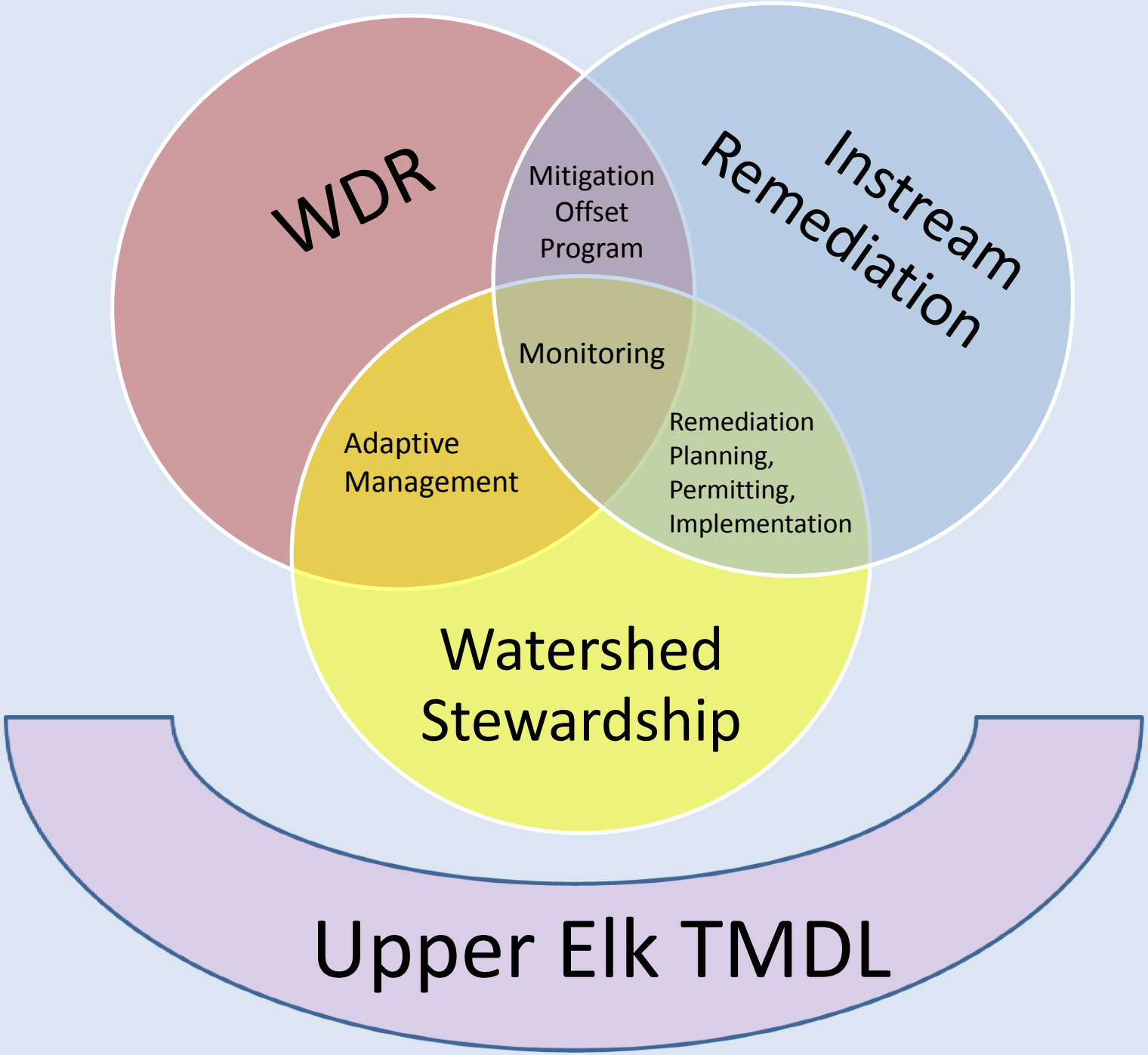
Comments on Peer Review Draft TMDL
➢ Refinements in Approaches

- Management/natural loading attributions
  - New “managed background”
  - ➢ Allocations & targets attainable?
- Variability
  - In natural loading estimates
  - Due to: weather, available data collection and analyses
  - ➢ Better disclose uncertainty; ensure trackable endpoints
- Long-term vs TMDL analysis period loading estimates
  - ➢ Better acknowledgement of processes; clarify TMDL time frame
- Cautionary Approach
  - Efficacy of current management measures
  - ➢ Monitoring & adaptive management framework

Peer Review Draft TMDL – 20 year Conceptual Policy Curve

Attempt to Balance Rate of Harvest, Investment in Instream Remediation, Time & Cautionary Approach

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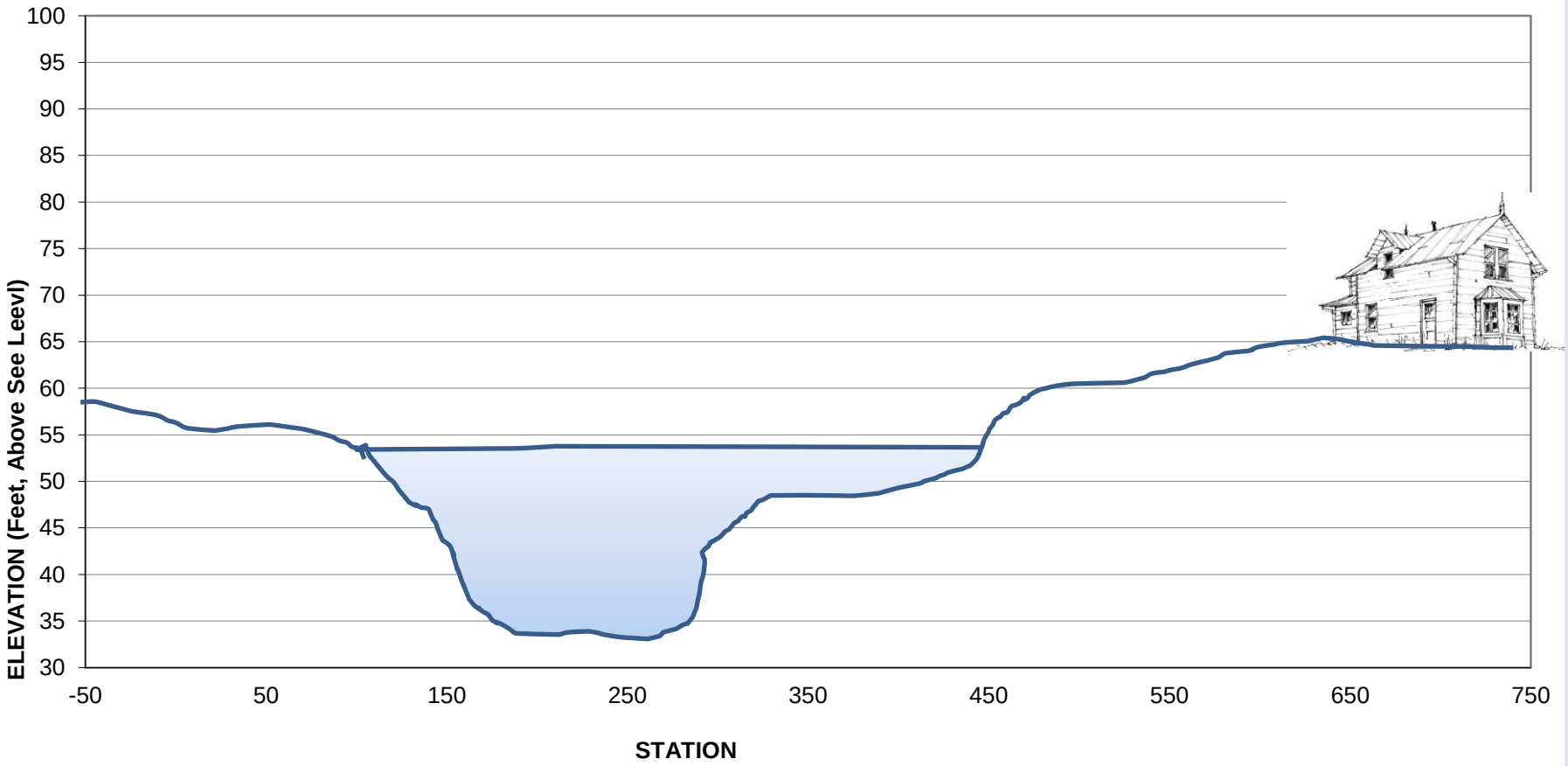
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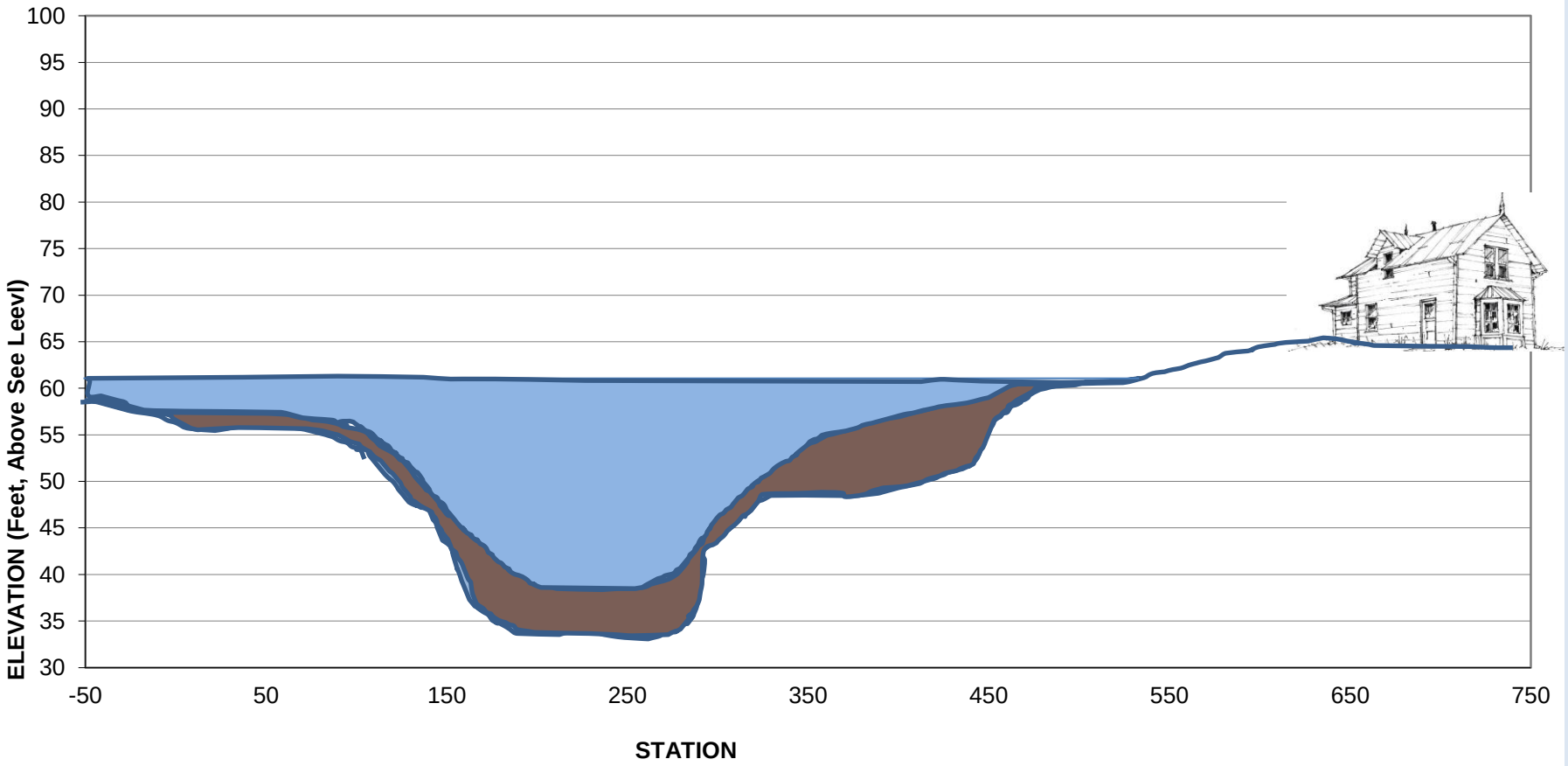
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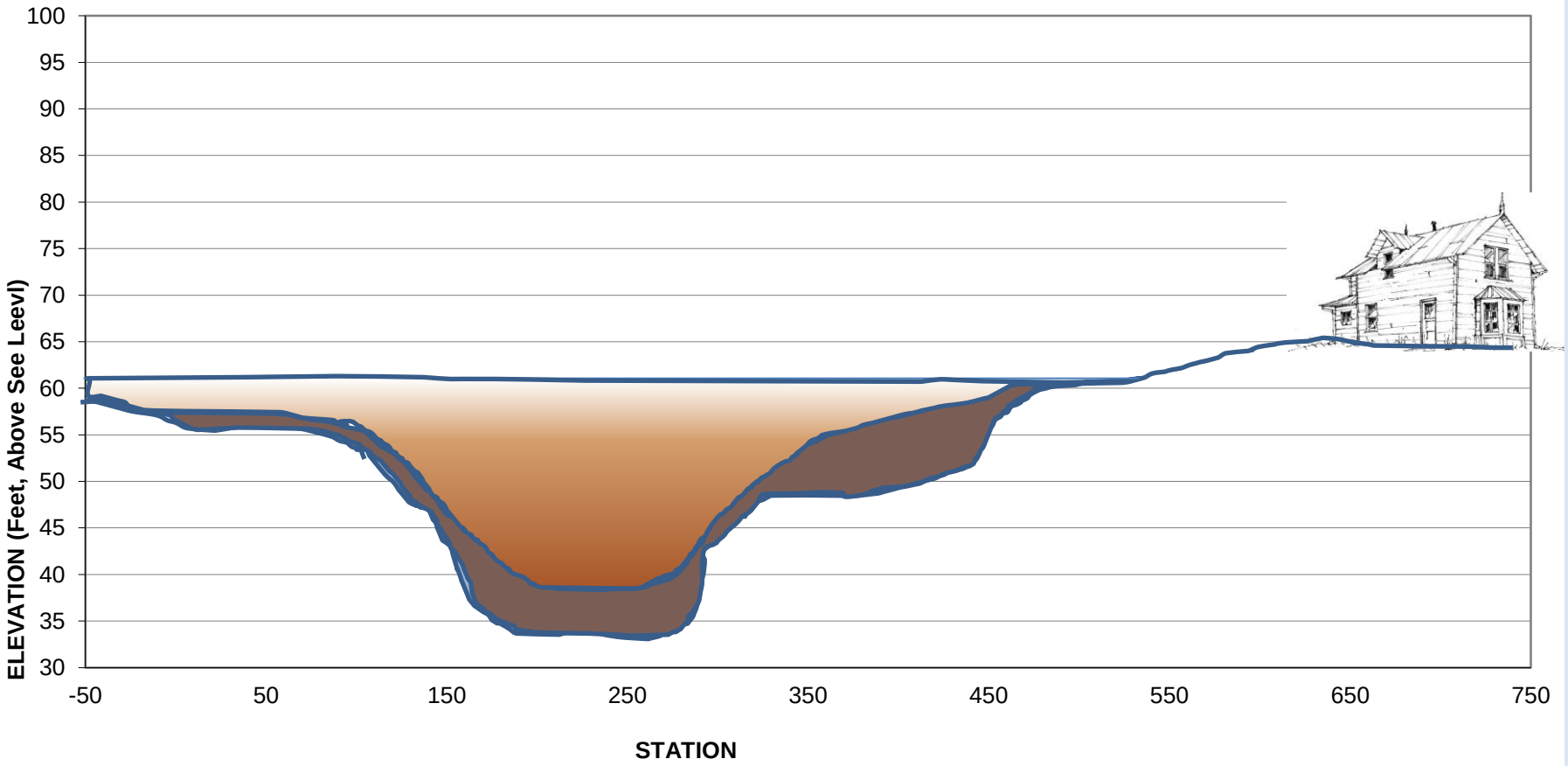
Input-Output = Change in Storage



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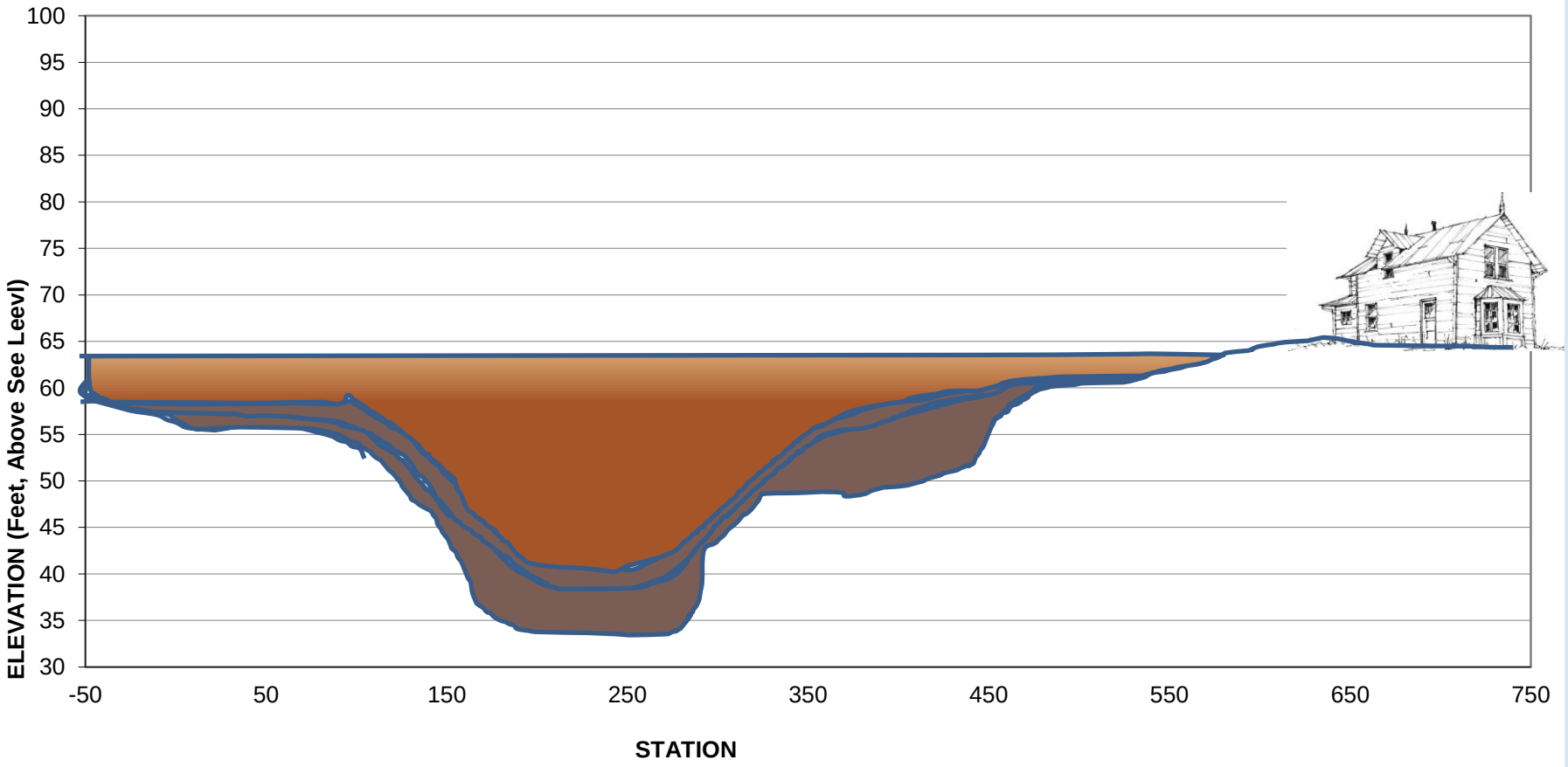

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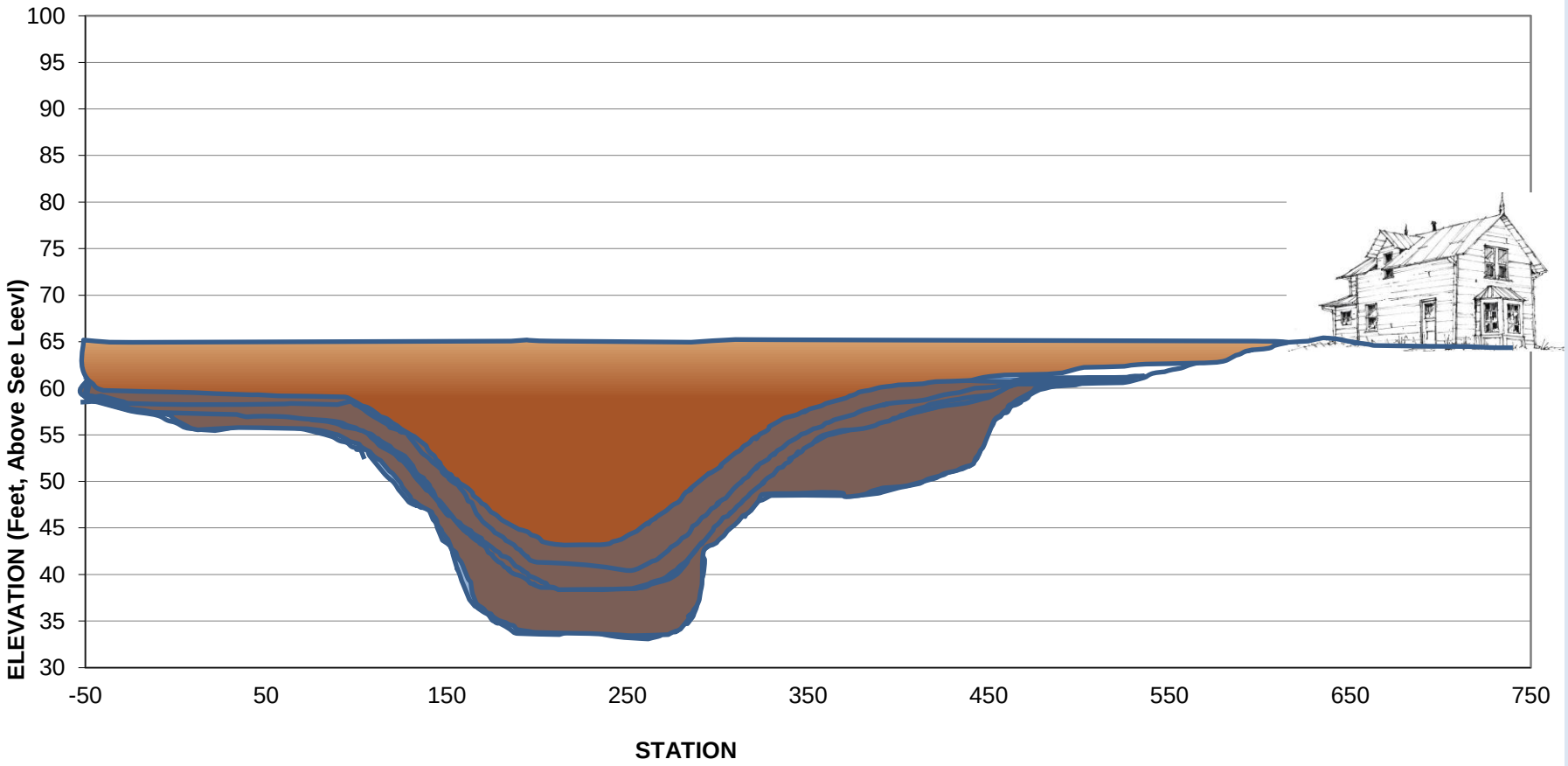

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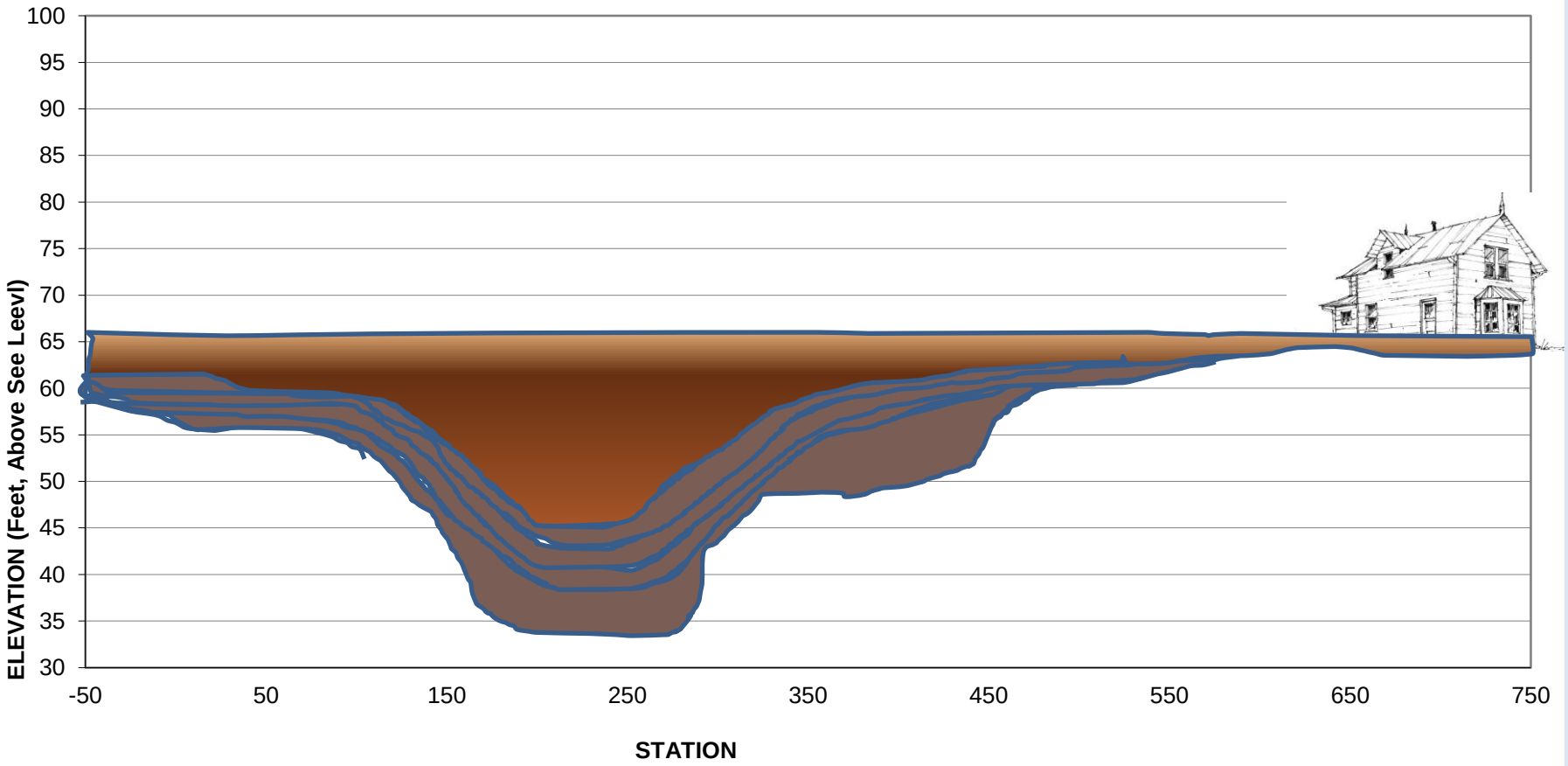


Remediation of Instream Deposits

- Peer Review Draft TMDL
  - Addressed instream deposits via load allocation
  - ➢ Potential revision to TMDL to identify instream deposits as consuming assimilative capacity
  - Reasonable assurance via compelling private investment
  - ➢ Watershed Stewardship & Sediment Mitigation Offset Program

Elk River Recovery Assessment:
Instream Remediation Feasibility Study

- Improve understanding of depositional reach
- Identify feasible remediation actions
- Develop an implementation framework
- Design & implement pilot projects
- Contract with CalTrout executed on April 29, 2014
  - Contract funding from State Board Cleanup and Abatement Account
  - Project cost shares from HRC, Ca Coastal Conservancy, Redwood Community Action Agency

Water Quality Monitoring

- Means of tracking changes in sediment loading
  - Most viable to discern percent reductions in sediment parameters rather than attainment of fixed end point
- Means to discern trends and account for variability due to weather
  - Multivariate regression of sediment parameters
- Existing Upper Elk water quality monitoring network
  - HRC, GDRC, & Salmon Forever; Recovery Assessment
  - Storm-based regressions
  - Appropriate to build upon existing monitoring under Stewardship framework to track progress on TMDL

Sediment Source Control

Rate of Harvest and Protection of Sensitive Areas

- Sensitive Areas – disturbance in areas with greatest potential to deliver sediment
  - Landslide hazard areas
  - Riparian areas
- Peak flows in headwater catchments – hydromodification due to timber harvest
- Rate of Harvest (ROH) – cumulative disturbance associated with timber harvest operations landscape-wide

Protection of Sensitive Areas
Landslide Hazard Areas

- Areas of elevated potential for landslide delivery
  - Landslides drove instream deposition in late 1990's
  - TMDL analyses initially focused on improving available tools including LiDAR, landslide inventories, slope stability modeling, field observation
  - Existing WDRs to control harvest-related landslides
  - ➢ Continue to expand and improve tools to inform management responses to sensitive areas
  - ➢ Continue to track landslides to inform trends and adaptive management
  - ➢ Improve identification and response to deep seated features and their activity levels

Protection of Sensitive Areas
Riparian Areas

- In-channel sources (bank erosion, streamside landslides)
  - Largest source of sediment
  - Anticipated as hardest to control – 20 year allocation
  - ➢ Support riparian area processes in Class I, Class II and Class III watercourses:

    Slope stability, channel stability, sediment stabilization

Protection of Sensitive Areas

Peak Flows in Class II and III Watercourses

- Peak flows inform existing rate of harvest limits in Elk and Freshwater by CalFire (2002) and Regional Water Board (2006)
- Draft target addresses link between harvesting and in-channel sources; designed to meet load allocation
- Based upon:
  - Peak flow increases due to canopy removal (Lewis, et al. 2001)
  - Increased loading from in-channel sediment sources due to peak flows (Reid, et al. 2010; Cafferata and Reid, 2013)
  - Greatest peakflow influence is localized and at scale of low order watercourses (Grant, et al. 2008)

Rate of Harvest
Landscape-wide application

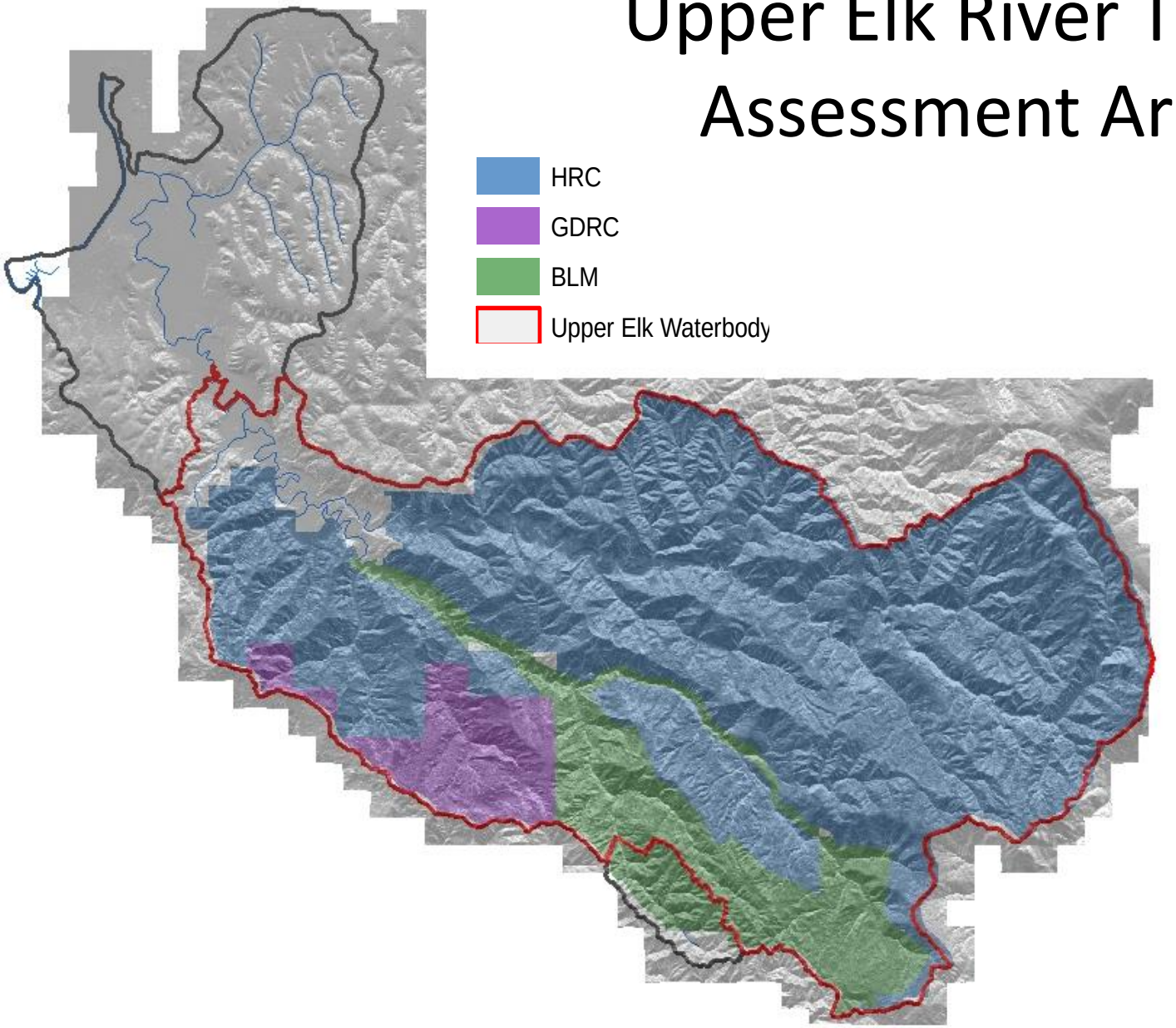
- ROH currently used in Elk and other North Coast watersheds to address cumulative impacts
- Chronic turbidity impacts fish health & water supplies
- Klein, Lewis, and Buffleben (2012)
  - Evaluated watershed regression variables for North Coast streams for correlation with 10% exceedence probability turbidity (10% Turbidity) in 2004 and 2005
  - $CCE_{10\text{-}15}$ & drainage area had highly significant correlations, r^2=0.63 (North Coast, n=27); r^2=0.82 (Humboldt, n=19)
  - Significant difference in 10% Turbidity for high and low rate of harvest groups

Rate of Harvest

- Staff find 1.5% maximum ROH target is supported as means to control cumulative effects
  - Best available science; Precautionary approach; Refine via adaptive management framework
- 10% Turbidity is a good metric for clearing between storms

- What are the appropriate rate of harvest limitations prior to, during, and after instream remediation?

Upper Elk River TMDL Assessment Area



Goal of an Upper Elk River WDR

Develop a consolidated regulatory program that is designed to restore and protect beneficial uses of water and abate nuisance flooding from the discharge of nonpoint sources of waste from the management of timberlands in the Upper Elk River watershed.

- Attainment of Water Quality standards
- Achieve Upper Elk River Sediment TMDL load allocations and targets
- Compliance with other water quality requirements
- Compliance with the State's Nonpoint Source Policy (2004)

WDR Revisions
Components under Consideration

Timberland Management Plans

- To be developed by each timberland owner to meet the goal of the WDR
- Submit to the Regional Water Board for public review, comment and inclusion in WDR

Timberland Management Plans

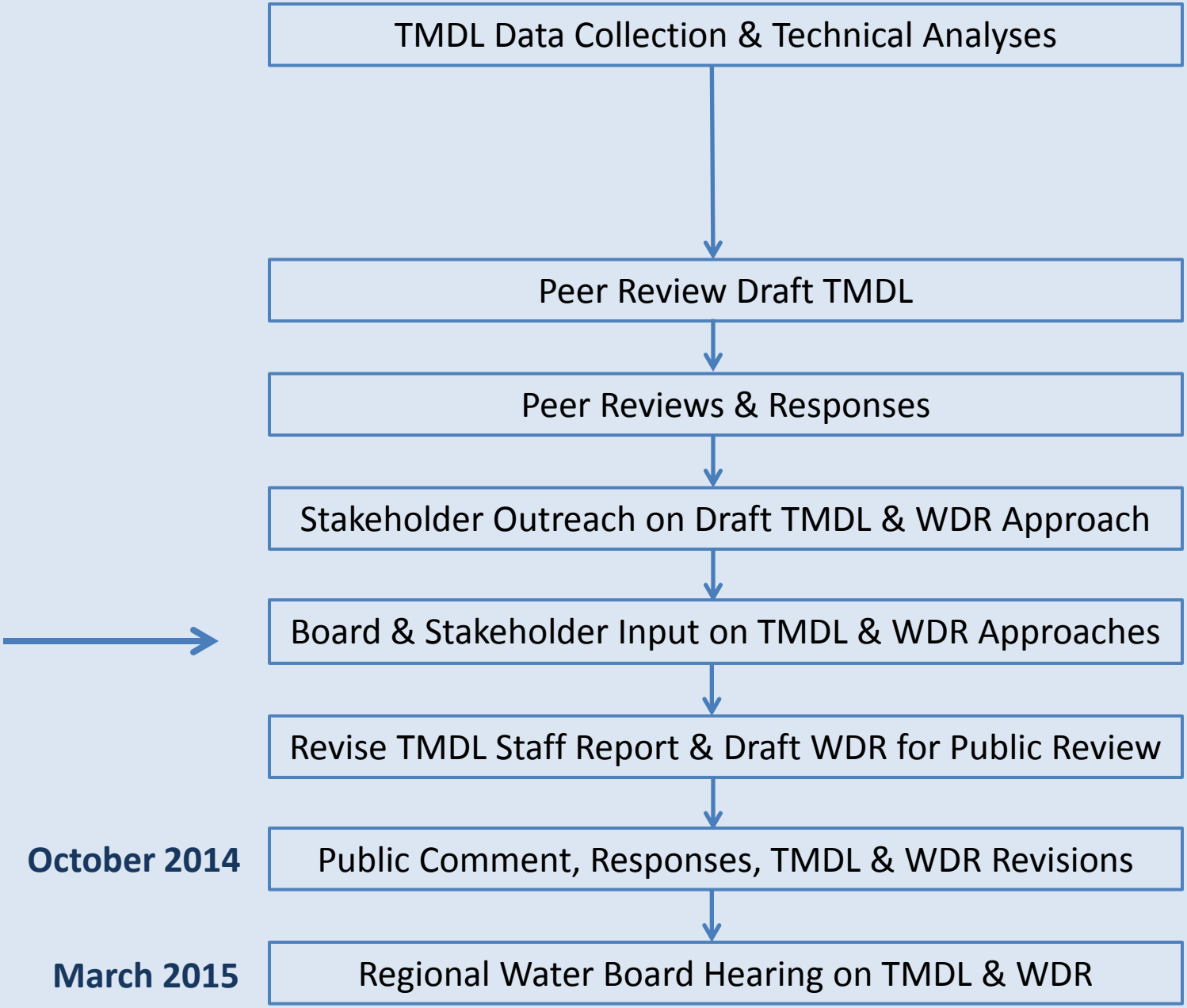
- Description of management measures to be used to prevent, minimize and mitigate for the discharge of waste
  - Road management
  - Rate of Harvest
  - Operations in sensitive areas
  - Instream Remediation
- Maps identifying
  - Location of timberlands on each ownership
  - Road system and status, locations of sediment discharge sites
  - Unstable areas (e.g. deep-seated, shallow hillslope, streamside landslides)
  - Timber harvest history (past 15 years)
  - Proposed timber harvesting (for the next 5 years)

WDR Revisions
Components under Consideration

- Additional WDR conditions (as necessary)
- Sediment Offset Mitigation Program
- 5 year time frame (Sunset date)

Sediment Offset Mitigation Program

- Concept
  - A mitigation program to allow permitting of management –induced discharges in violation of water quality standards
- Considerations
  - Instream remediation will take time to plan, permit, fund & implement
  - Attainment of hillslope load allocations will take time
  - New disturbance will generate sediment, slow recovery
  - Additional aggradation will exacerbate impairments to fish, water supplies, flooding
- Possibilities
  - In-lieu fee program to support remediation activities
  - Offsets
  - Market-based approach
  - Voluntary
- Many unknowns
- Elk River watershed warrants a creative solution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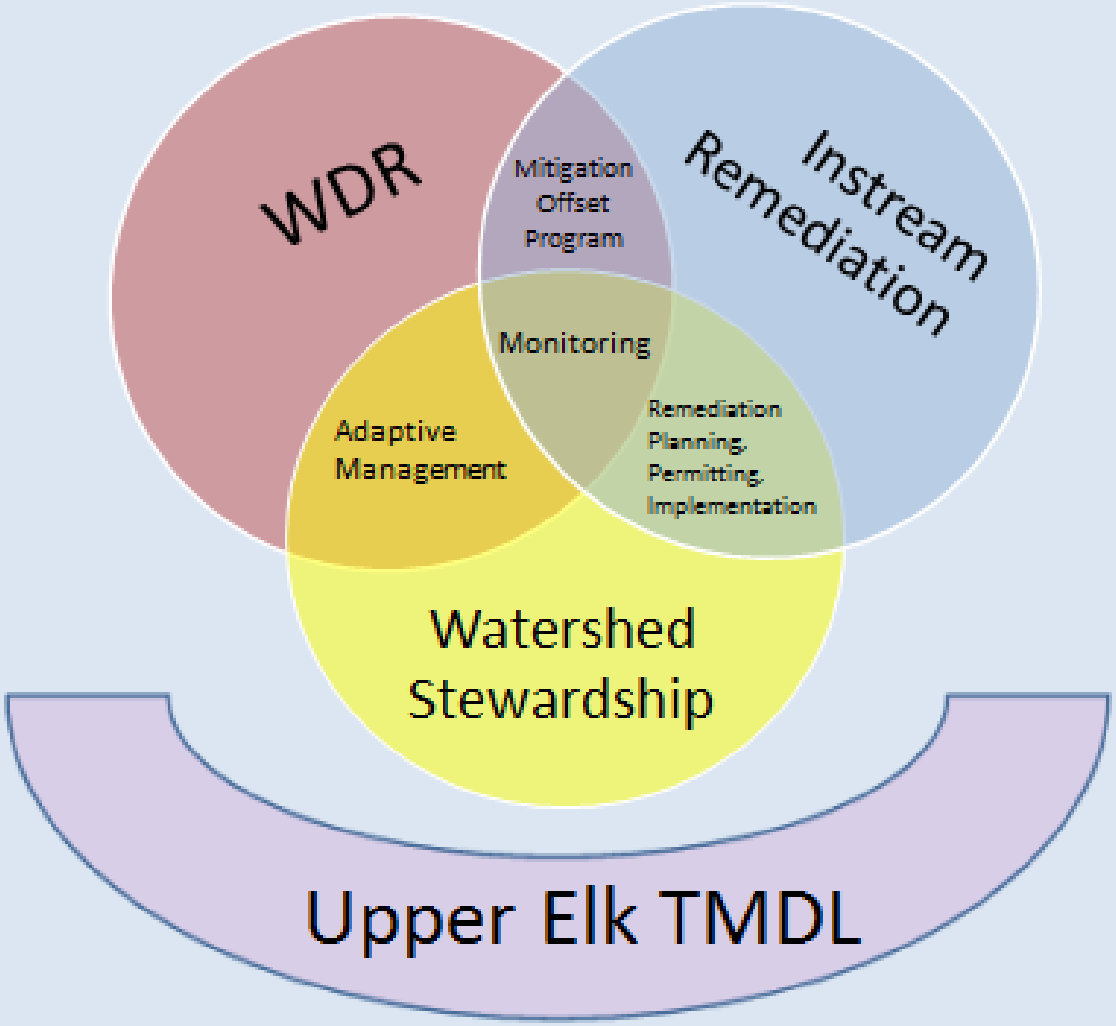
Strategy for Assuring Recovery

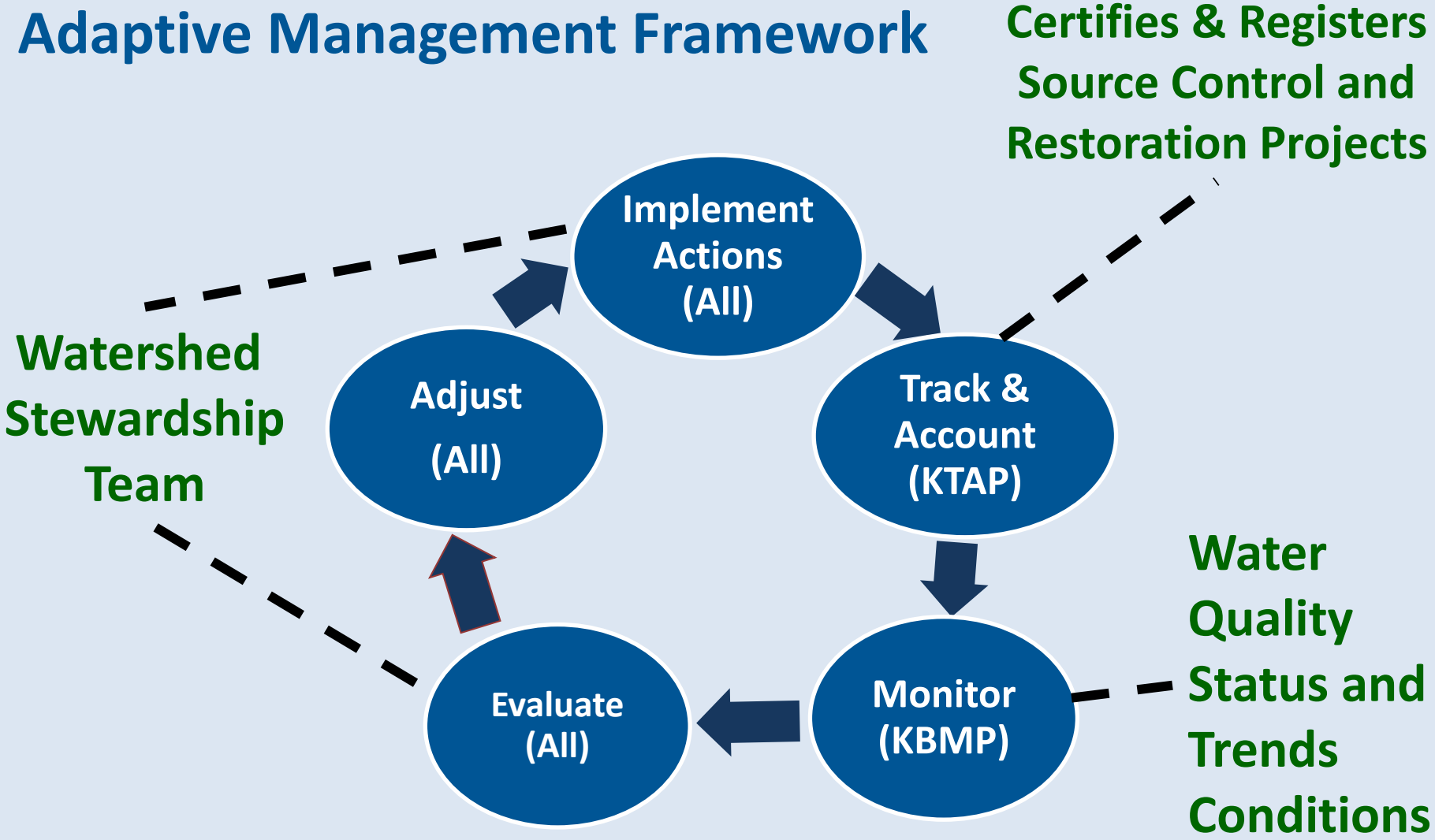


Watershed Stewardship Approach

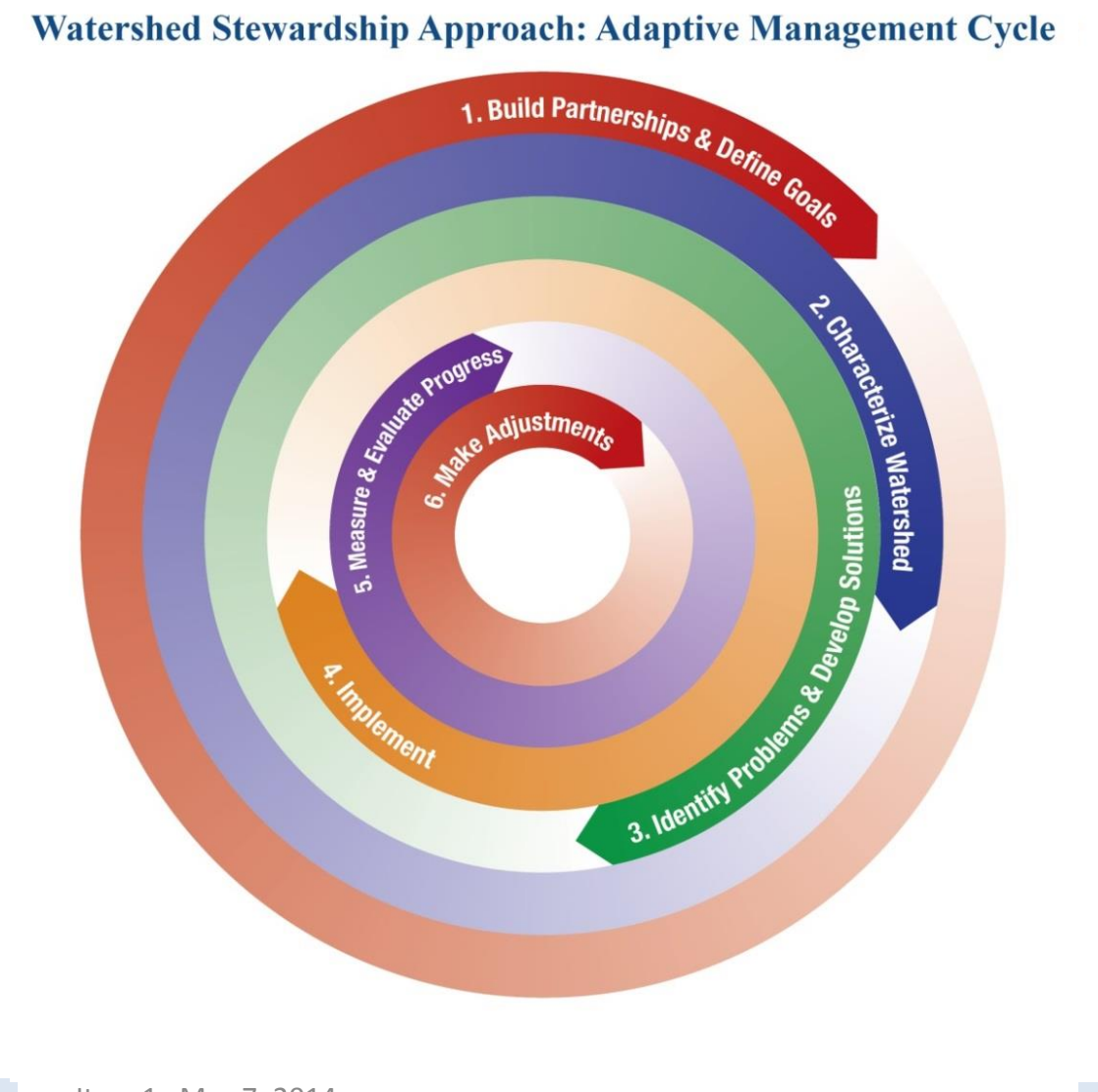
- Tested - Collaborative framework emerged from highly polarized setting
- Inclusive Process - Engages stakeholders in a meaningful and respectful manner
- Demonstrated Success - Increases the pace and scale of project / source control implementation
- NPS Control and Restoration Programs - Approach is designed for circumstances characterized by high levels of uncertainty

Klamath Watershed Stewardship Approach

Adaptive Management Framework



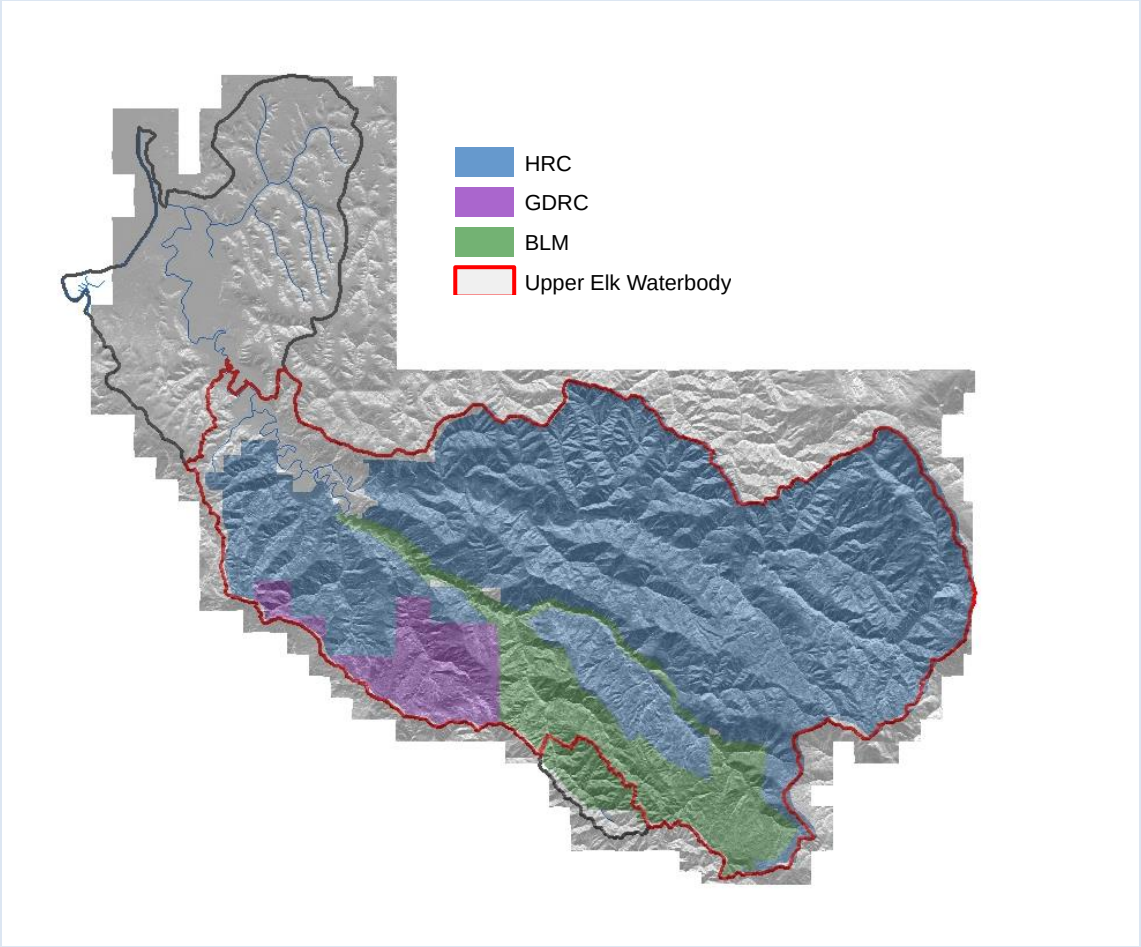
Watershed Stewardship Framework



An approach that supports collaborative outcomes

Elk River Watershed Stewardship Approach

- Expanded boundaries
- Increased number of potential partners
- Elk River TMDL, WDR, and Recovery Assessment are compatible sub-components



Building the Elk River Watershed Stewardship Approach

- Identify local lead entity and resources to support continued partnership building and coordination activities
- Develop coordinated data management and assessment system
- Identify watershed stewardship project priorities
- Develop stewardship project tracking and accounting program
- Develop a mechanism for collaborative funding (e.g., mitigation offset or market-based protocols)

Elk River Watershed Stewardship
Near Term Goals

- Continue to build support & identify partners
- Convene initial kick-off meeting in Summer 2014
- Identify public funding sources with near-term application deadlines

Why Adopt A Watershed Stewardship Approach for the Elk River?

- Collaborative approach
- Maximize funding opportunities
- Manage mitigation offset program
- Prioritize watershed needs
- Planning, permitting, managing remediation and rehabilitation projects
- Coordinated monitoring
- Adaptive management to better manage uncertainties
- Reasonable assurance of recovery

Legal Authority

- Porter-Cologne
  - WDR
  - CAO
- TMDL
  - Level necessary to implement water quality standards
  - Reasonable assurance

Policy Controls

- Instream Sediment Remediation
  - CAO, Progressive ROH, mitigation offset, invite investment?
- Rate of Harvest Limitations
  - 0, 1.5%, 1.9%, 3.9%, no limit?
- Protection of Sensitive Areas
  - FPR, HCP, TMDL targets, Prohibition?

Risk Management

- Tools and timing?
- Guidance on implementing existing program?

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