

# UMATILLA RIVER



## Action Plan Volume 2

March 2025







VOLUME 2

Appendix A: Umatilla Subbasin Subwatersheds Uplands Actions

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## UMATILLA RIVER

# Action Plan- Appendix A

## Umatilla Subbasin Subwaterheds Uplands Actions



CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

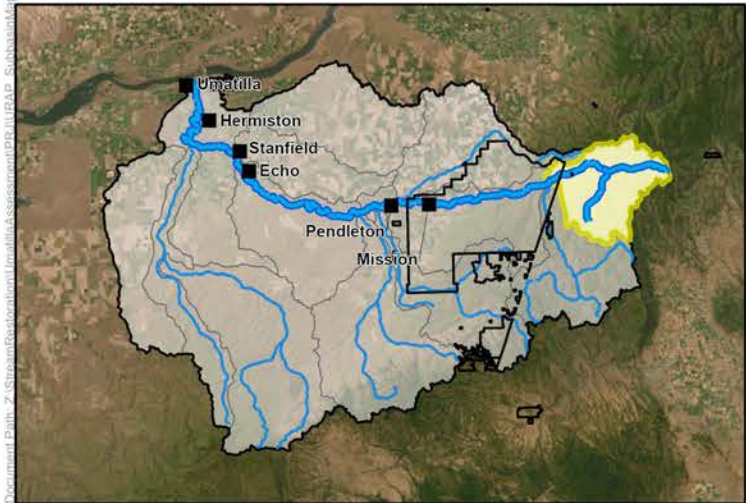
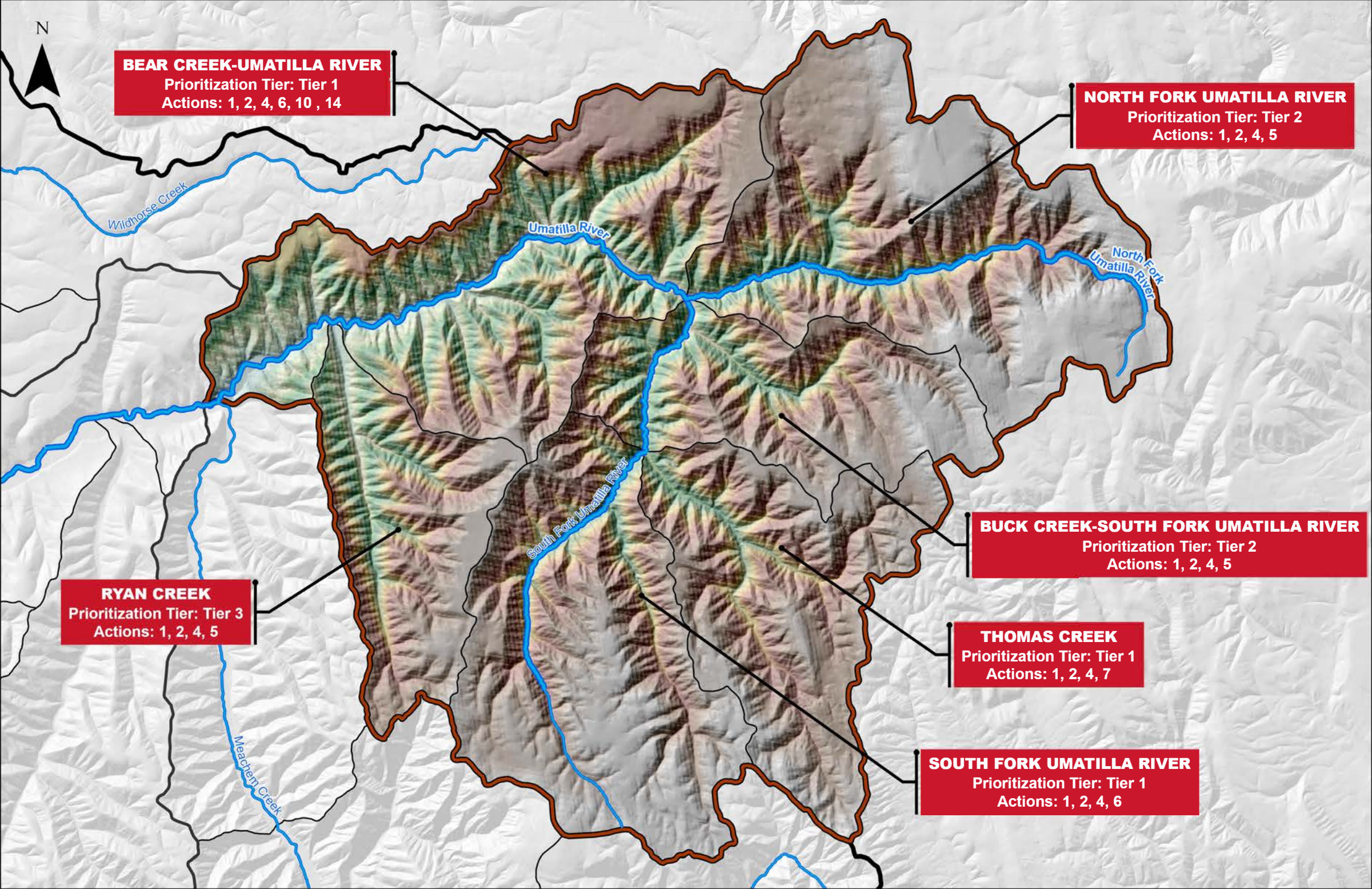


Watershed Opportunities

HUC10 Watershed Name:  
Headwaters Umatilla River Watershed

All Potential Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (3) Reduce - Mitigate Point or Non-Point Source Impacts
- (4) Nutrients Additions (carcasses)
- (5) Upland Vegetation Treatment - Management
- (6) Road Grading - Drainage Improvements
- (7) Road Decommissioning or Abandonment
- (8) Water Management-Improve Irrigation Efficiency
- (9) Acquire or Increase Instream Flow (Lease/Purchase; GW Storage)
- (10) Remove Non-native Plants
- (11) Off--Site Water Developments
- (12) Riparian Buffer Strip, Planting
- (13) Selective Thinning
- (14) Beaver Re-introduction or Management
- (15) Riparian Fencing

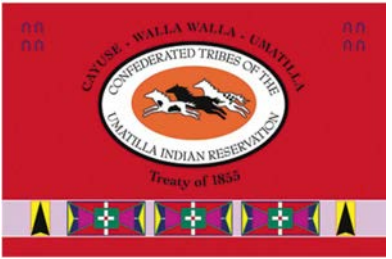
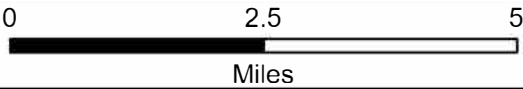


Legend

- 2020 Umatilla River Centerline
  - HUC8 Major Streams
  - Umatilla Subbasin
  - HUC10 Watersheds
  - HUC12 Subwatersheds
  - Watershed in focus
- Elevation (in feet)
- High : 5500
  - Low : 1750

Umatilla River Assessment  
Subbasin Uplands Map Book

Headwaters Umatilla River Watershed  
Restoration Actions





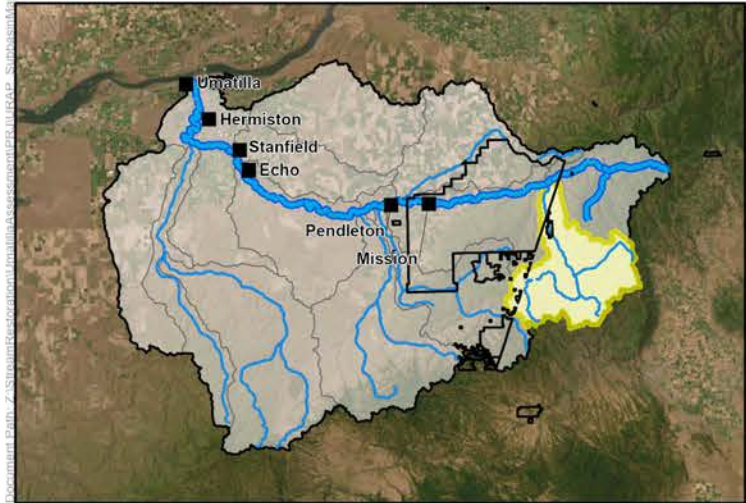
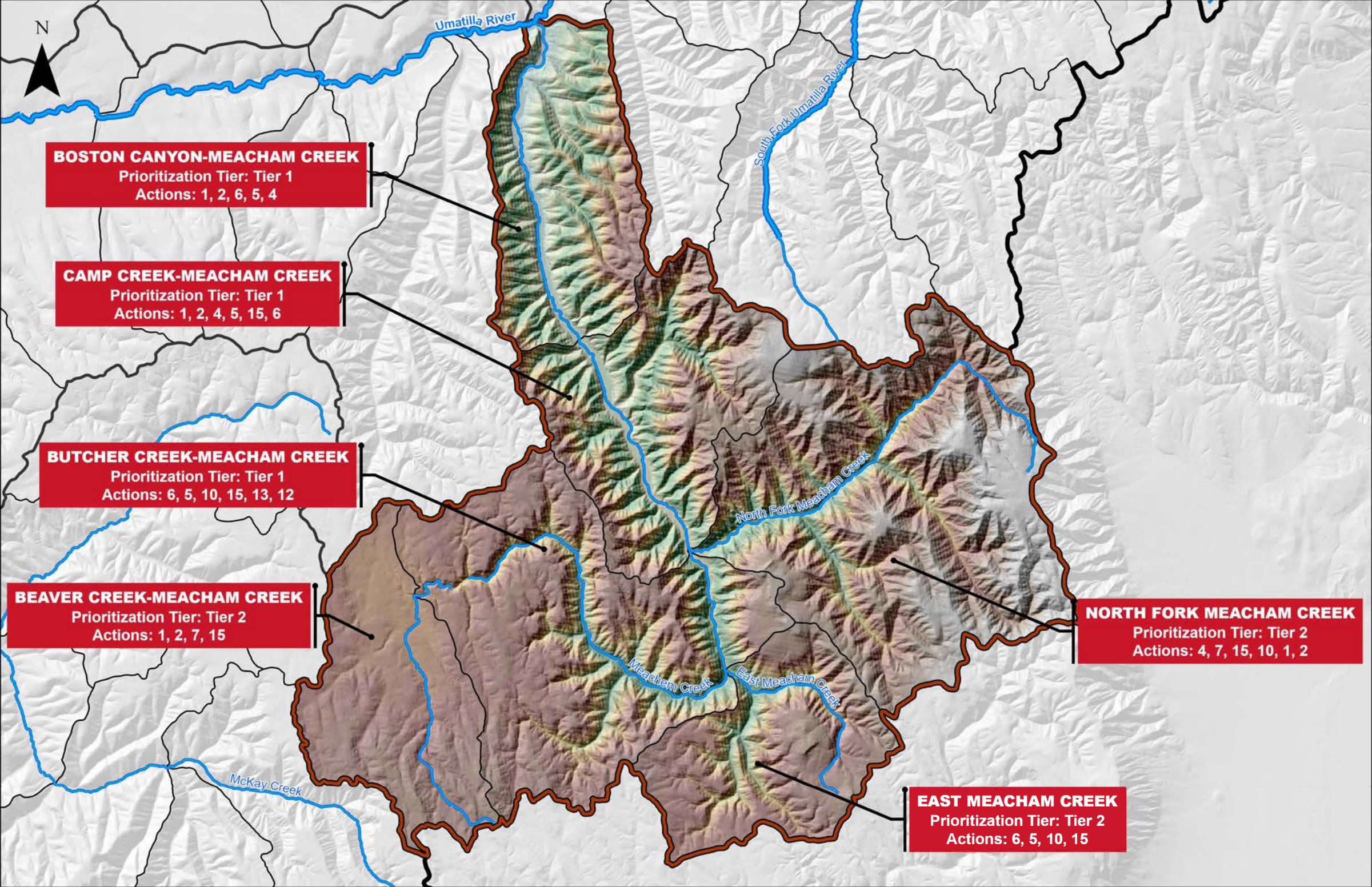
Watershed Opportunities

HUC10 Watershed Name:

Meacham Creek Watershed

All Potential Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (3) Reduce - Mitigate Point or Non-Point Source Impacts
- (4) Nutrients Additions (carcasses)
- (5) Upland Vegetation Treatment - Management
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- (12) Riparian Buffer Strip, Planting
- (13) Selective Thinning
- (14) Beaver Re-introduction or Management
- (15) Riparian Fencing



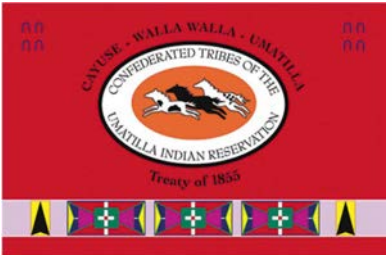
Legend

- 2020 Umatilla River Centerline
- HUC8 Major Streams
- Umatilla Subbasin
- HUC10 Watersheds
- HUC12 Subwatersheds
- Watershed in focus

Elevation (in feet)  
High : 6000  
Low : 1750

Umatilla River Assessment  
Subbasin Uplands Map Book

Meacham Creek Watershed  
Restoration Actions





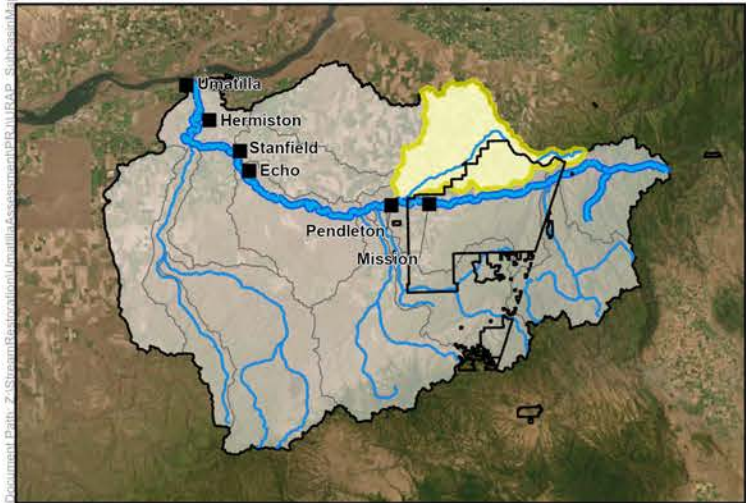
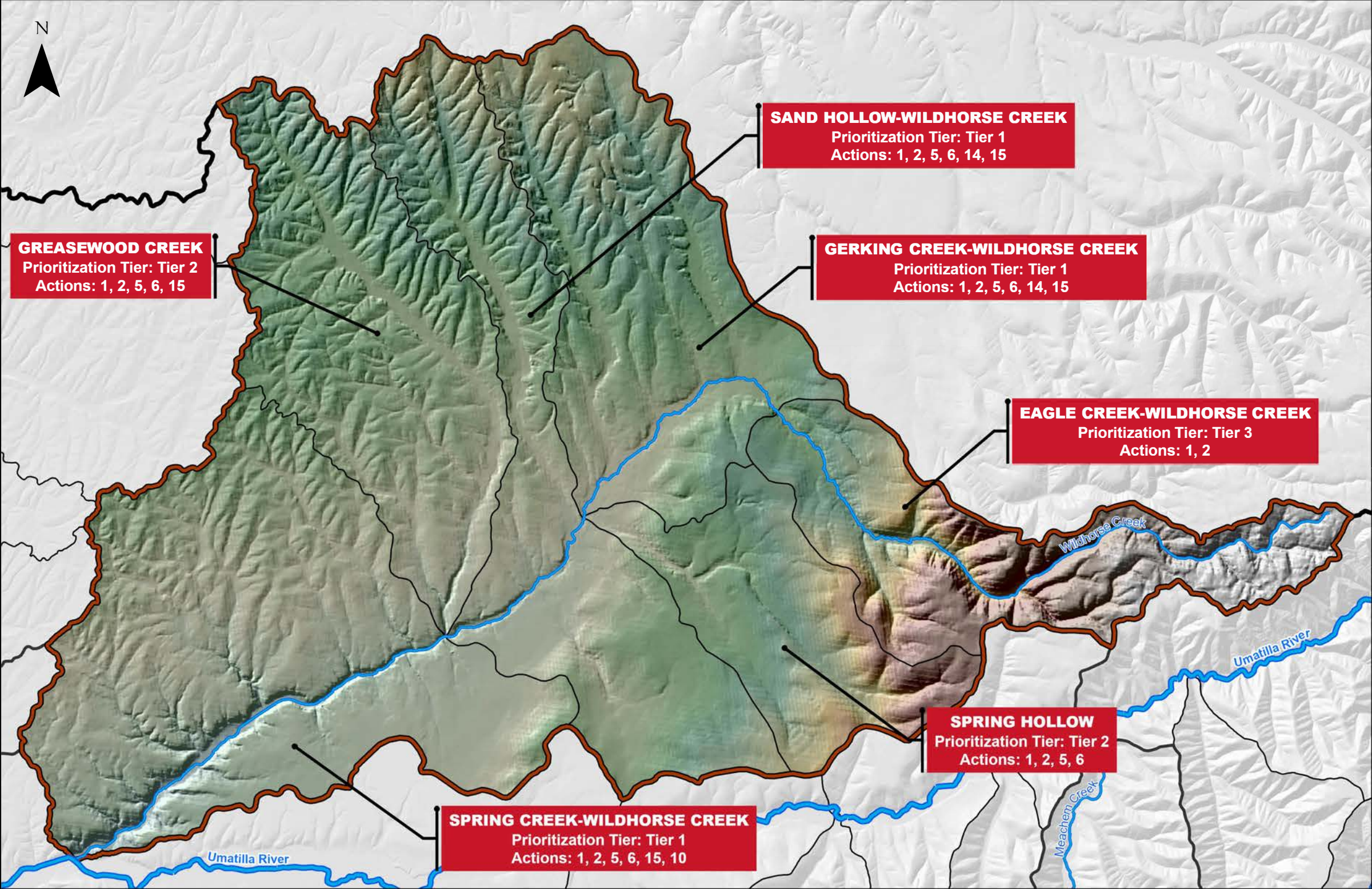
Watershed Opportunities

HUC10 Watershed Name:

Wildhorse Creek Watershed

All Potential Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (3) Reduce - Mitigate Point or Non-Point Source Impacts
- (4) Nutrients Additions (carcasses)
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- (15) Riparian Fencing



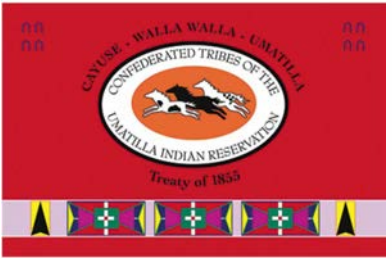
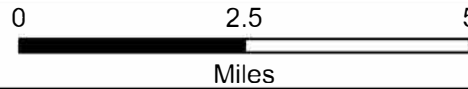
Legend

- 2020 Umatilla River Centerline
- HUC8 Major Streams
- Umatilla Subbasin
- HUC10 Watersheds
- HUC12 Subwatersheds
- Watershed in focus



Umatilla River Assessment  
Subbasin Uplands Map Book

Wildhorse Creek Watershed  
Restoration Actions





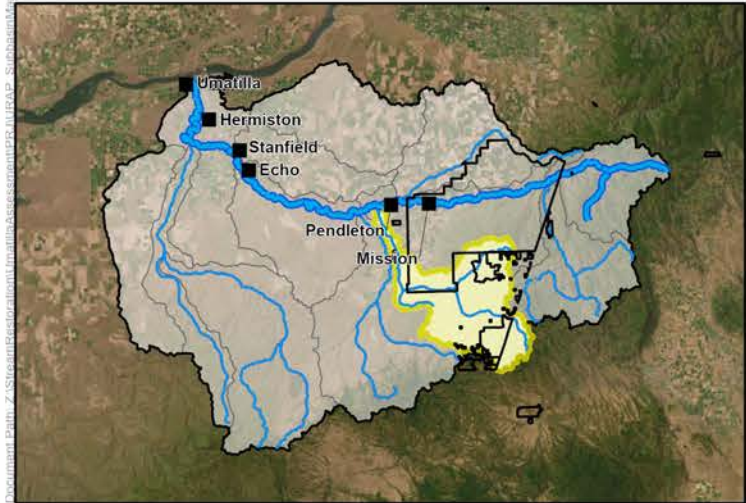
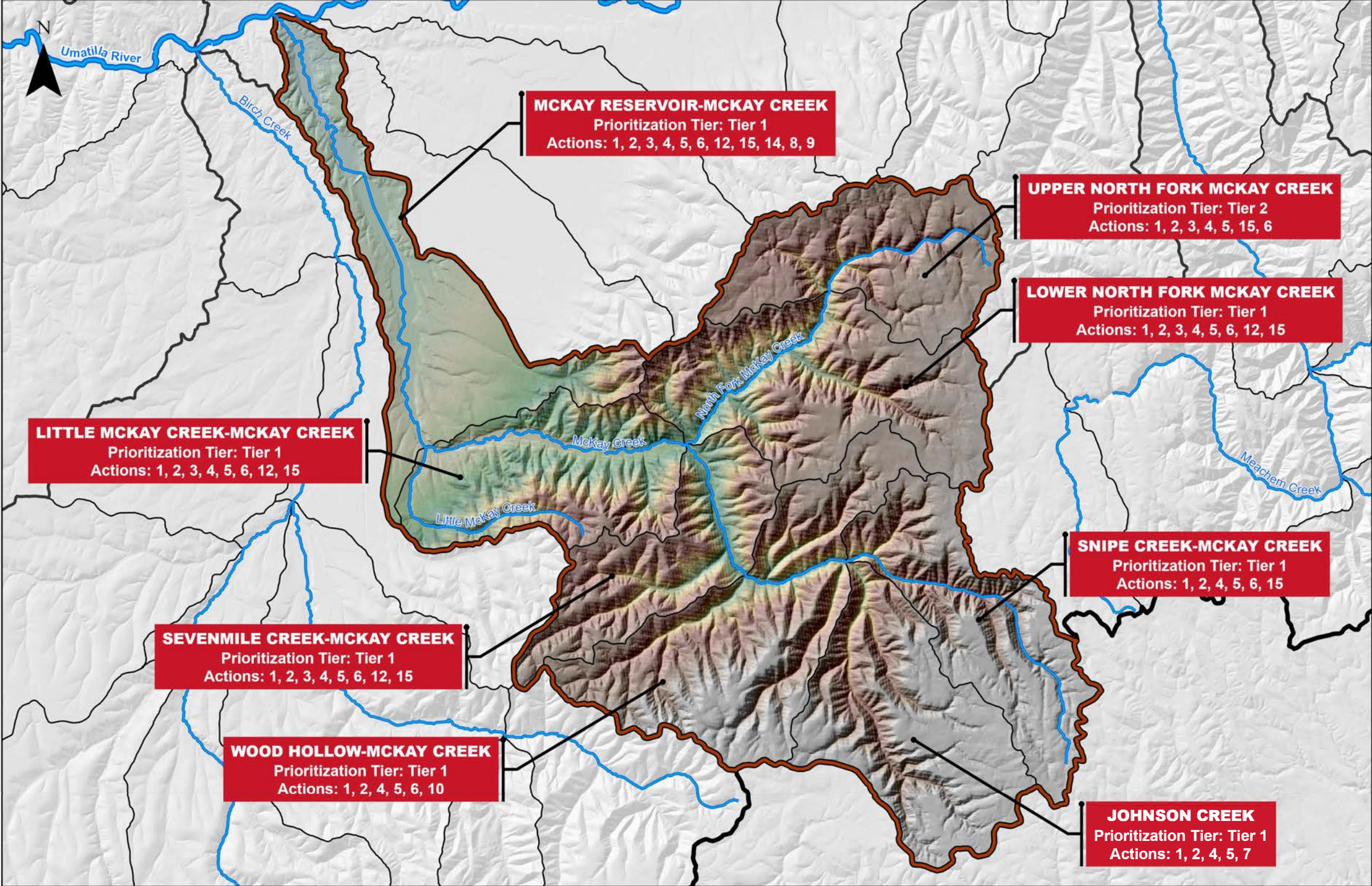
Watershed Opportunities

HUC10 Watershed Name:

McKay Creek Watershed

All Potential Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (3) Reduce - Mitigate Point or Non-Point Source Impacts
- (4) Nutrients Additions (carcasses)
- (5) Upland Vegetation Treatment - Management
- (6) Road Grading - Drainage Improvements
- (7) Road Decommissioning or Abandonment
- (8) Water Management-Improve Irrigation Efficiency
- (9) Acquire or Increase Instream Flow (Lease/Purchase; GW Storage)
- (10) Remove Non-native Plants
- (11) Off--Site Water Developments
- (12) Riparian Buffer Strip, Planting
- (13) Selective Thinning
- (14) Beaver Re-introduction or Management
- (15) Riparian Fencing



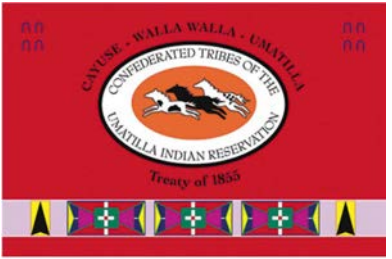
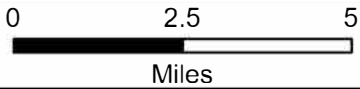
Legend

- 2020 Umatilla River Centerline
- HUC8 Major Streams
- Umatilla Subbasin
- HUC10 Watersheds
- HUC12 Subwatersheds
- Watershed in focus

Elevation (in feet)  
High : 4800  
Low : 1000

Umatilla River Assessment  
Subbasin Uplands Map Book

McKay Creek Watershed  
Restoration Actions



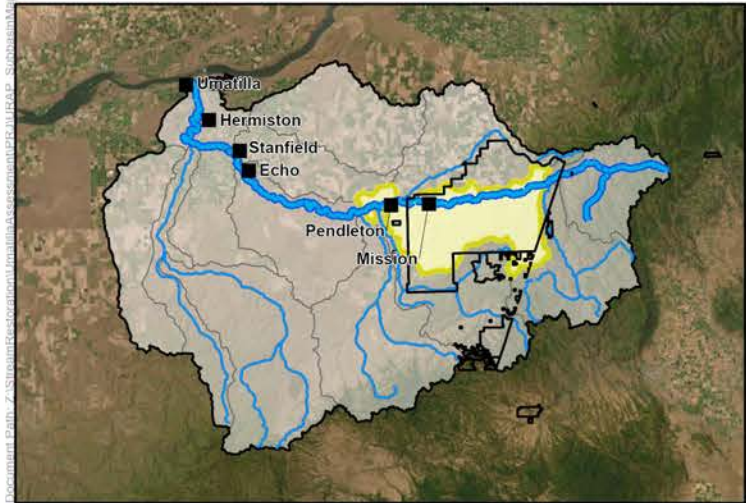
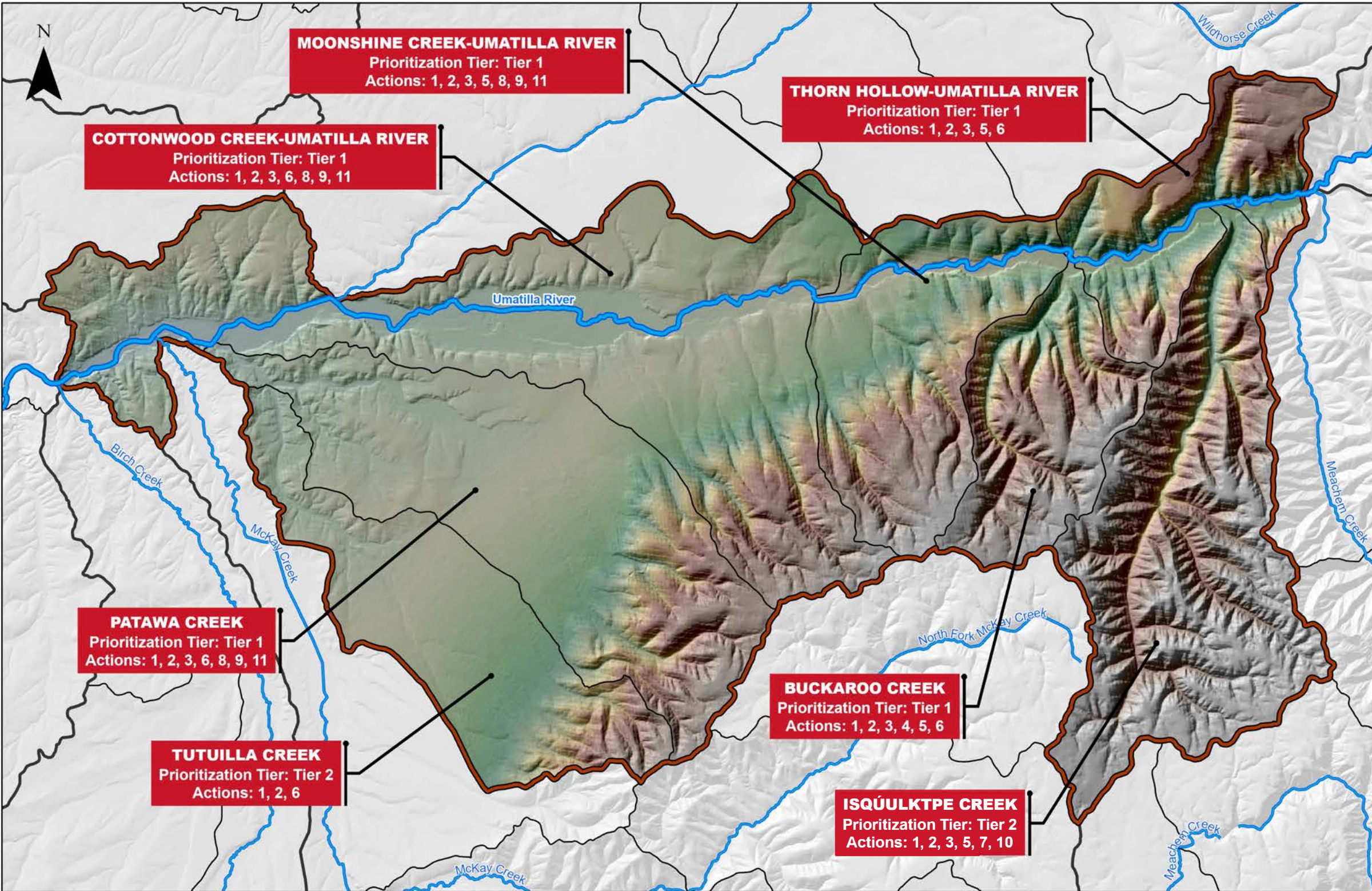


Watershed Opportunities

HUC10 Watershed Name:  
Mission Creek-Umatilla River Watershed

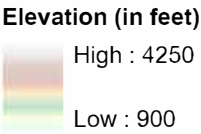
All Potential Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (3) Reduce - Mitigate Point or Non-Point Source Impacts
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- (15) Riparian Fencing



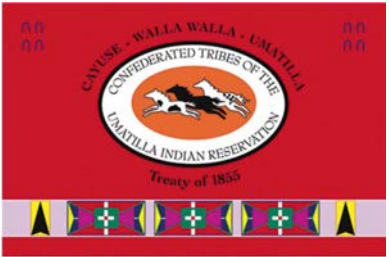
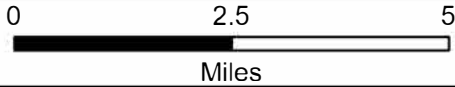
Legend

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- HUC10 Watersheds
- HUC12 Subwatersheds
- Watershed in focus



Umatilla River Assessment  
Subbasin Uplands Map Book

Mission Creek-Umatilla River Watershed  
Restoration Actions





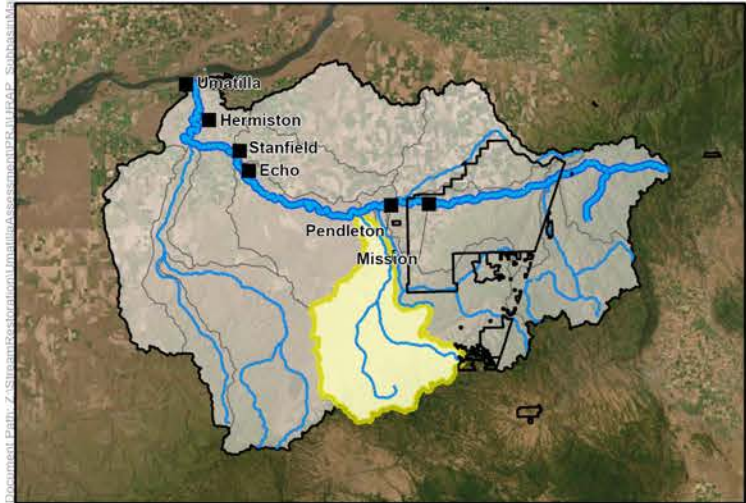
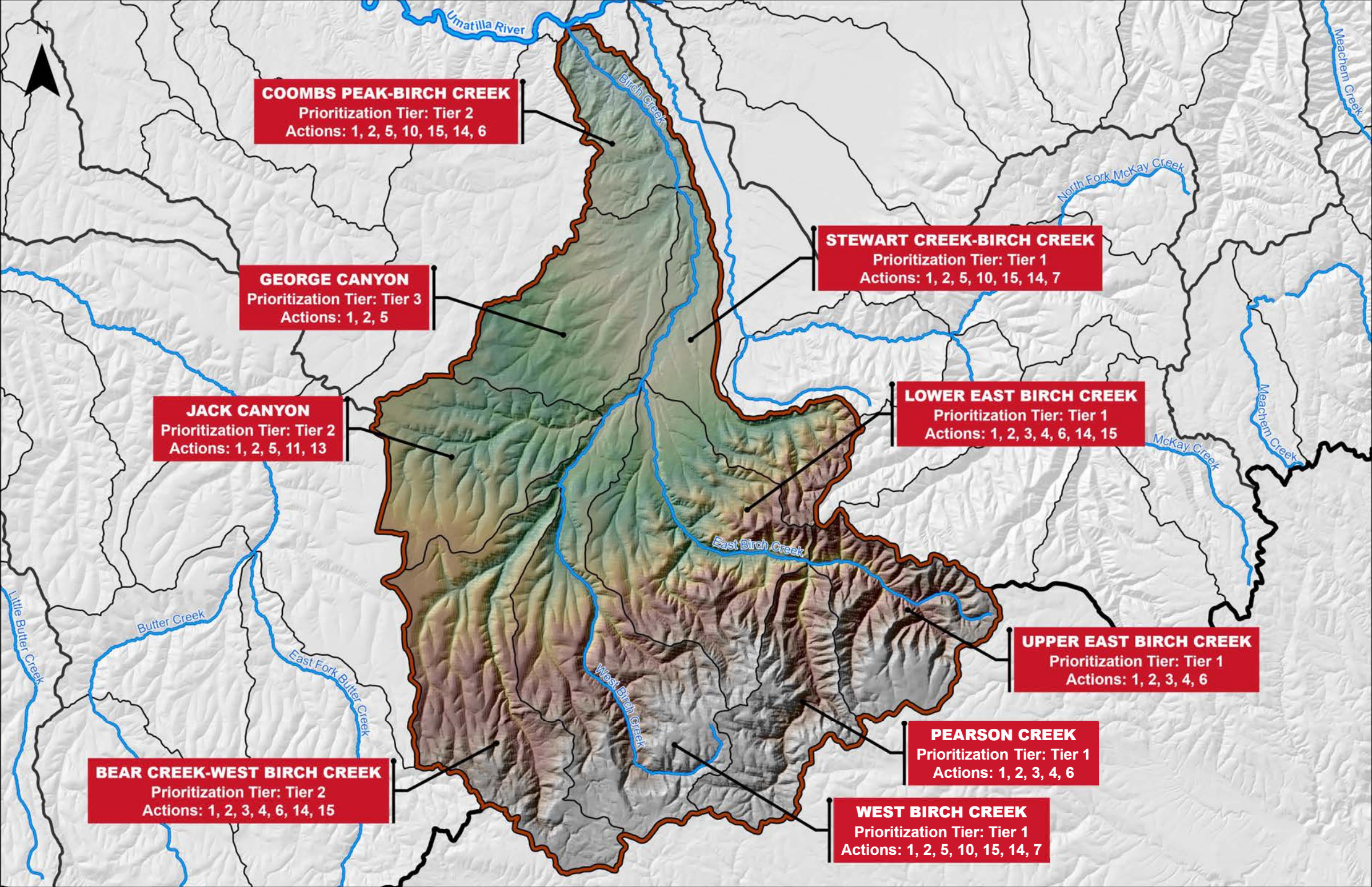
Watershed Opportunities

HUC10 Watershed Name:

Birch Creek Watershed

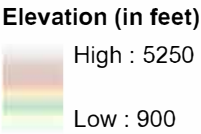
All Potential Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
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- (15) Riparian Fencing



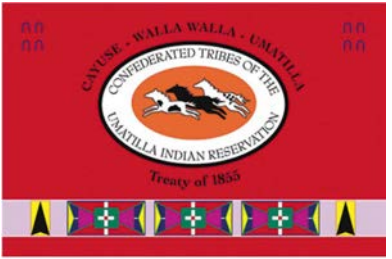
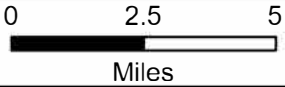
Legend

- 2020 Umatilla River Centerline
- HUC8 Major Streams
- Umatilla Subbasin
- HUC10 Watersheds
- HUC12 Subwatersheds
- Watershed in focus



Umatilla River Assessment  
Subbasin Uplands Map Book

Birch Creek Watershed  
Restoration Actions



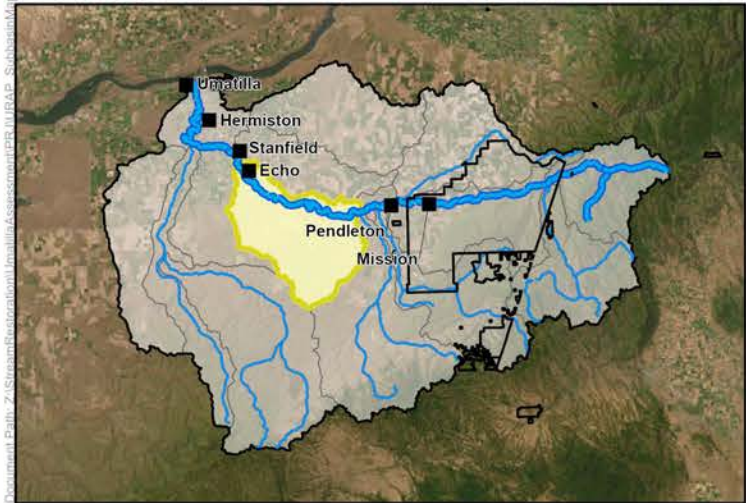
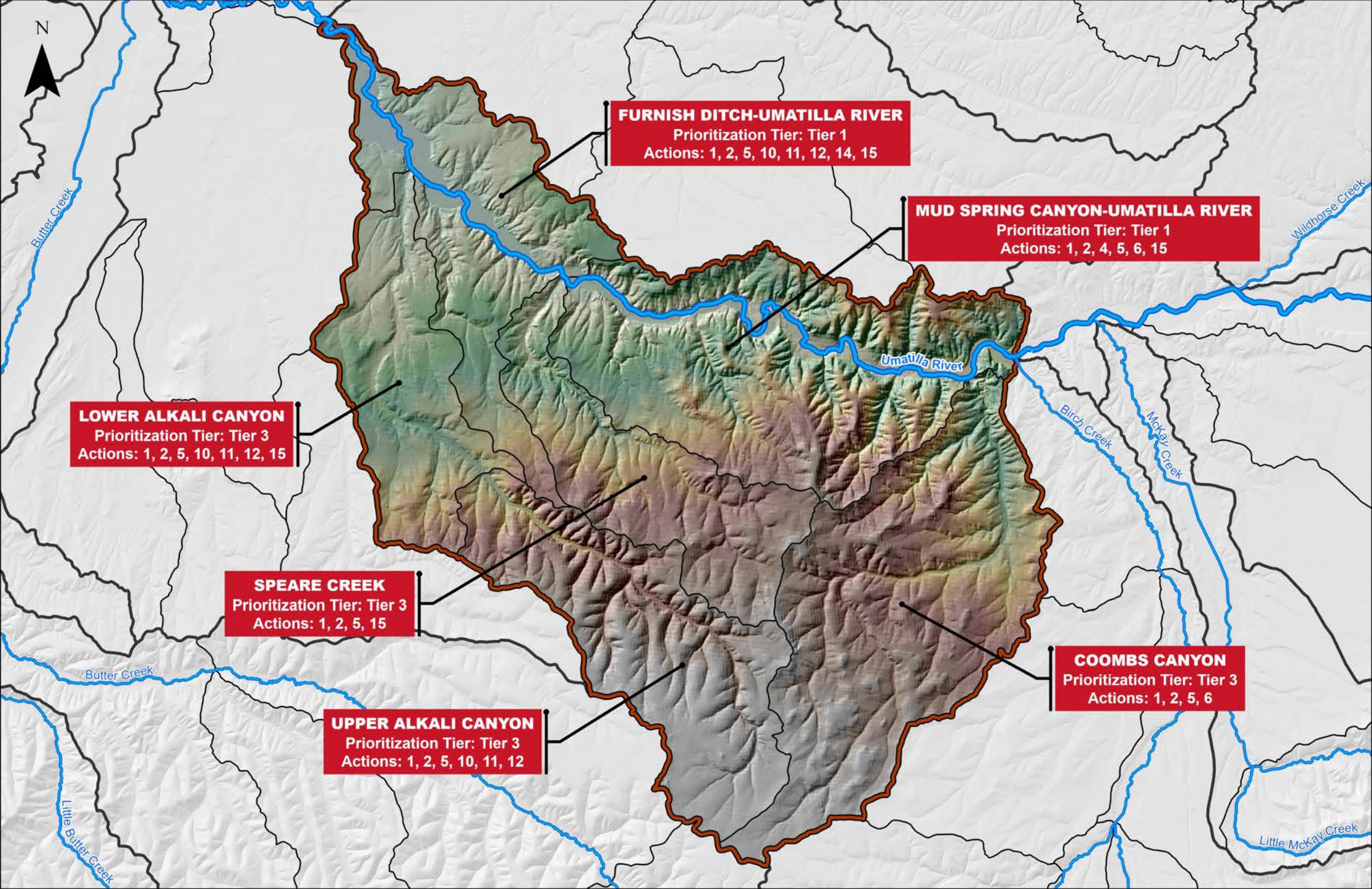


Watershed Opportunities

HUC10 Watershed Name:  
Alkali Canyon-Umatilla River Watershed

All Potential Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (3) Reduce - Mitigate Point or Non-Point Source Impacts
- (4) Nutrients Additions (carcasses)
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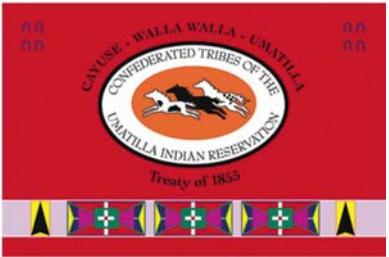
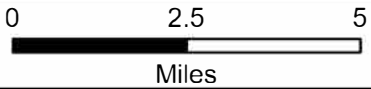
Legend

- 2020 Umatilla River Centerline
- HUC8 Major Streams
- Umatilla Subbasin
- HUC10 Watersheds
- HUC12 Subwatersheds
- Watershed in focus

Elevation (in feet)  
High : 2900  
Low : 500

Umatilla River Assessment  
Subbasin Uplands Map Book

Alkali Canyon-Umatilla River Watershed  
Restoration Actions





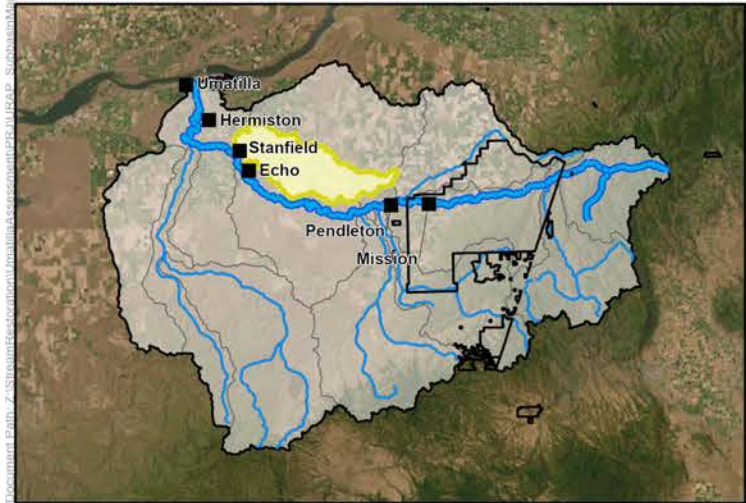
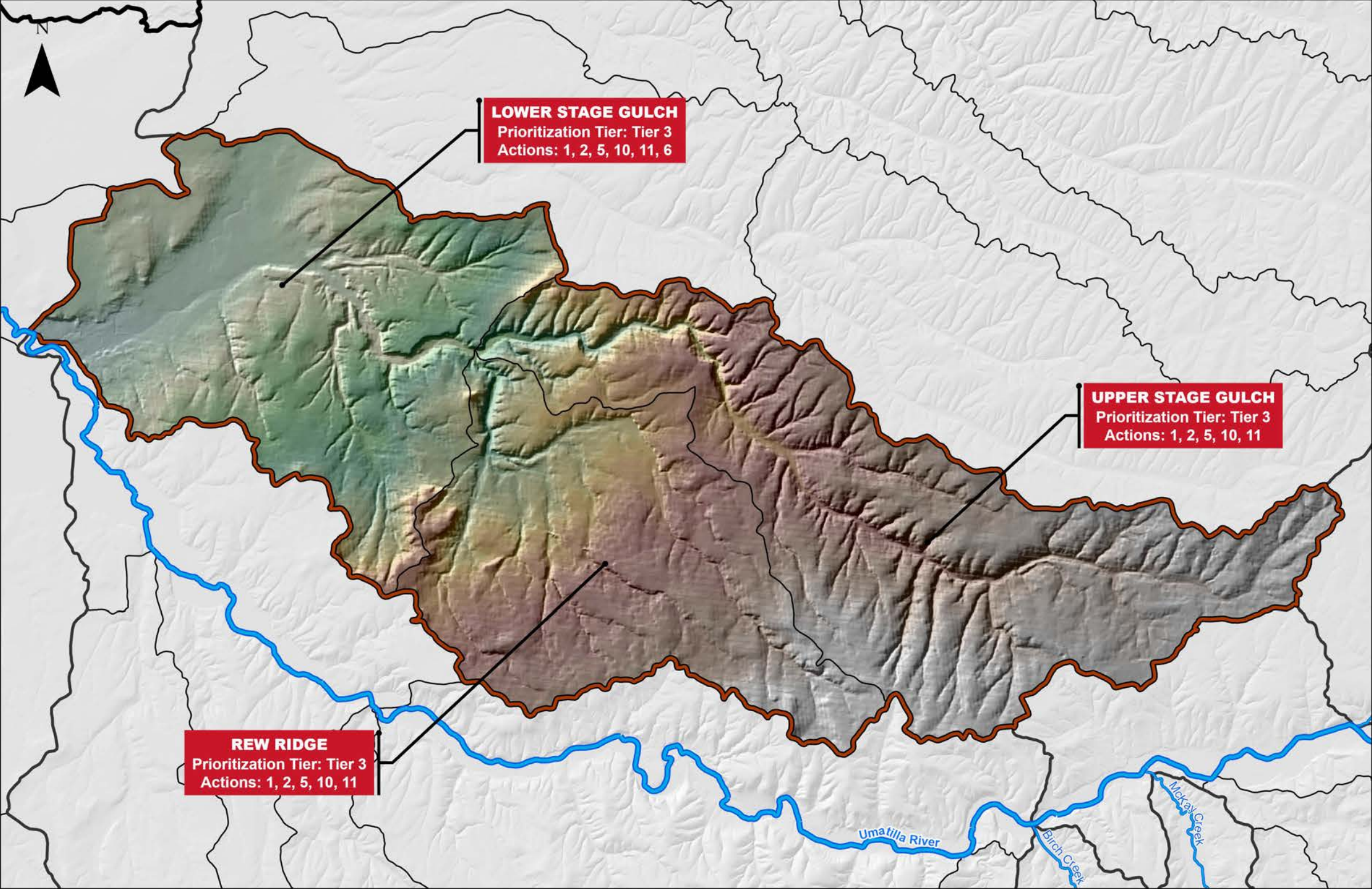
Watershed Opportunities

HUC10 Watershed Name:

Stage Gulch Watershed

All Potential Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (3) Reduce - Mitigate Point or Non-Point Source Impacts
- (4) Nutrients Additions (carcasses)
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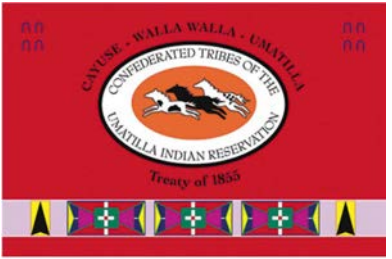
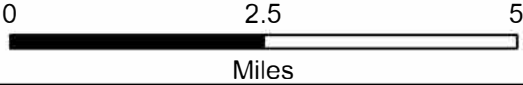
Legend

- 2020 Umatilla River Centerline
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- Umatilla Subbasin
- HUC10 Watersheds
- HUC12 Subwatersheds
- Watershed in focus



Umatilla River Assessment Subbasin Uplands Map Book

Stage Gulch Watershed Restoration Actions





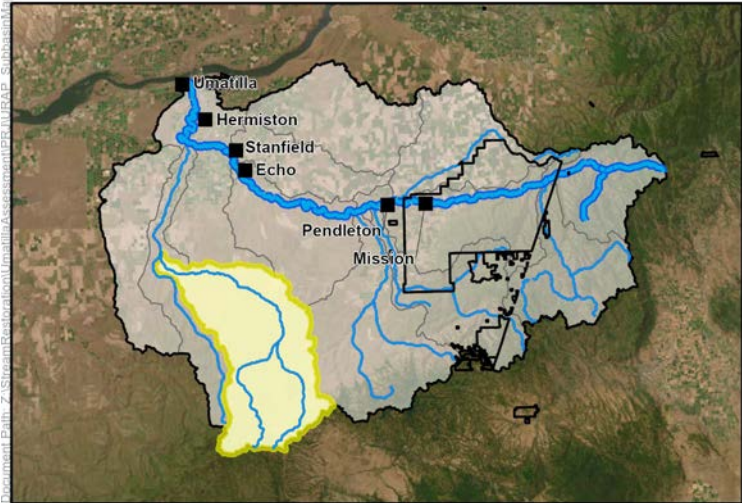
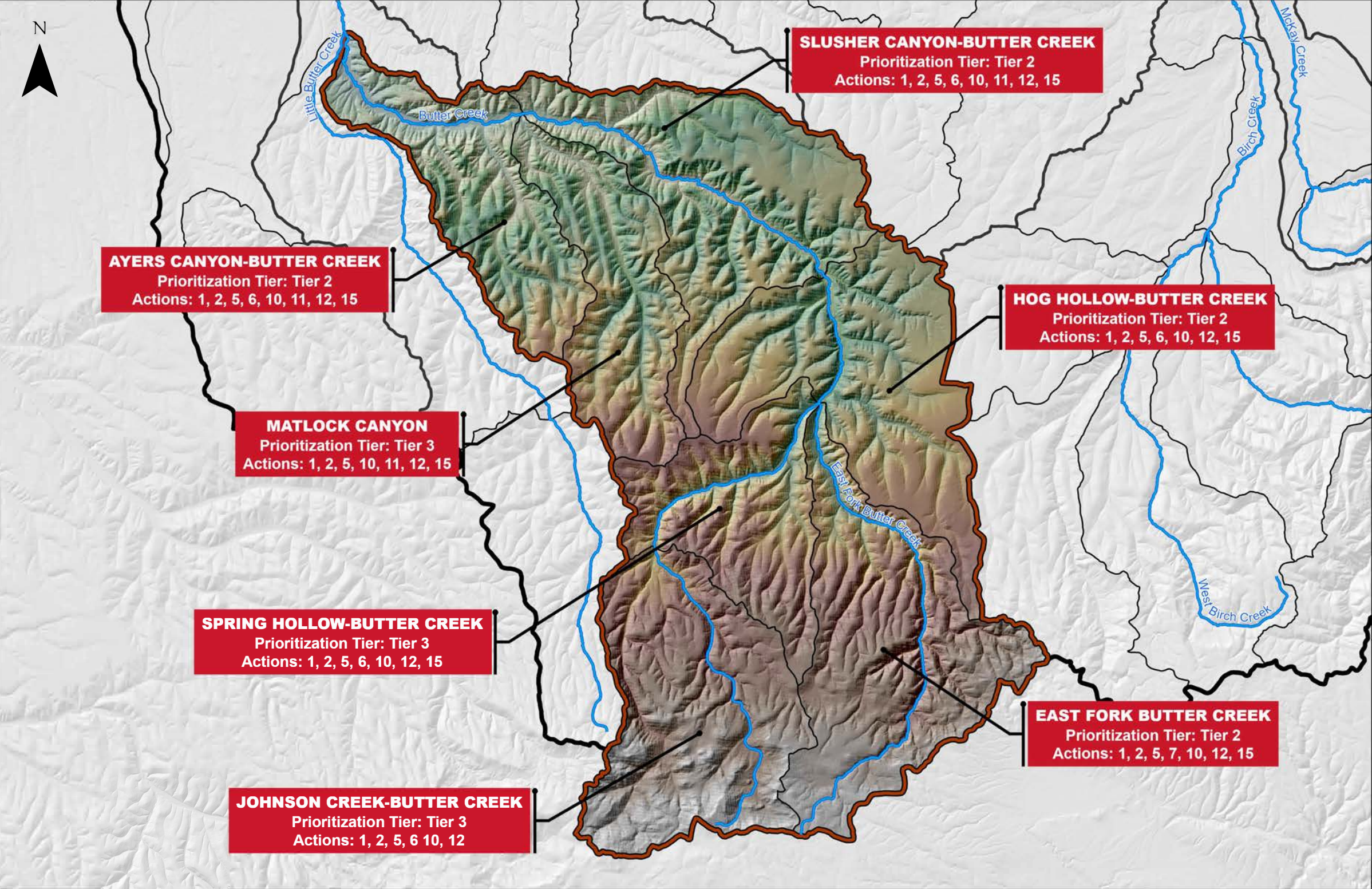
Watershed Opportunities

HUC10 Watershed Name:

Upper Butter Creek Watershed

All Potential Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (3) Reduce - Mitigate Point or Non-Point Source Impacts
- (4) Nutrients Additions (carcasses)
- (5) Upland Vegetation Treatment - Management
- (6) Road Grading - Drainage Improvements
- (7) Road Decommissioning or Abandonment
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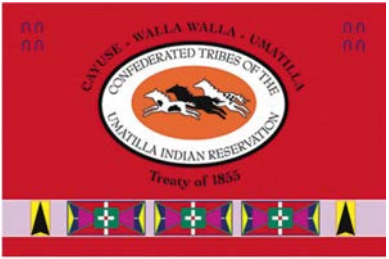
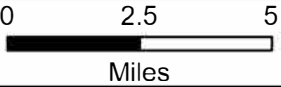
Legend

- 2020 Umatilla River Centerline
- HUC8 Major Streams
- Umatilla Subbasin
- HUC10 Watersheds
- HUC12 Subwatersheds
- Watershed in focus

Elevation (in feet)  
High : 5850  
Low : 1000

Umatilla River Assessment  
Subbasin Uplands Map Book

Upper Butter Creek Watershed  
Restoration Actions



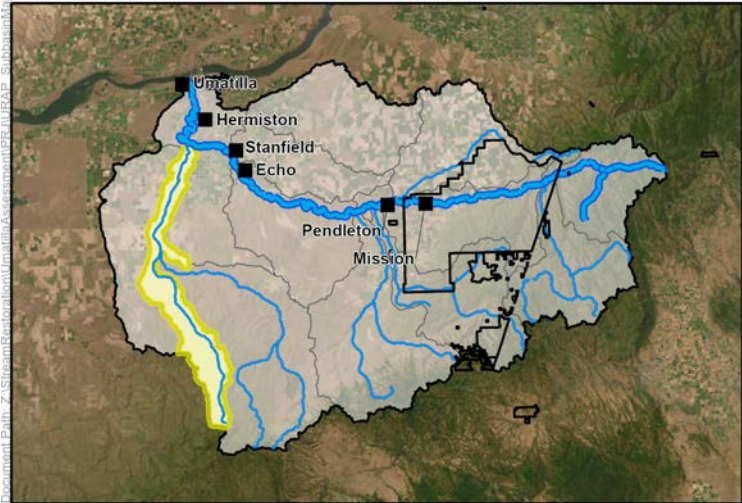
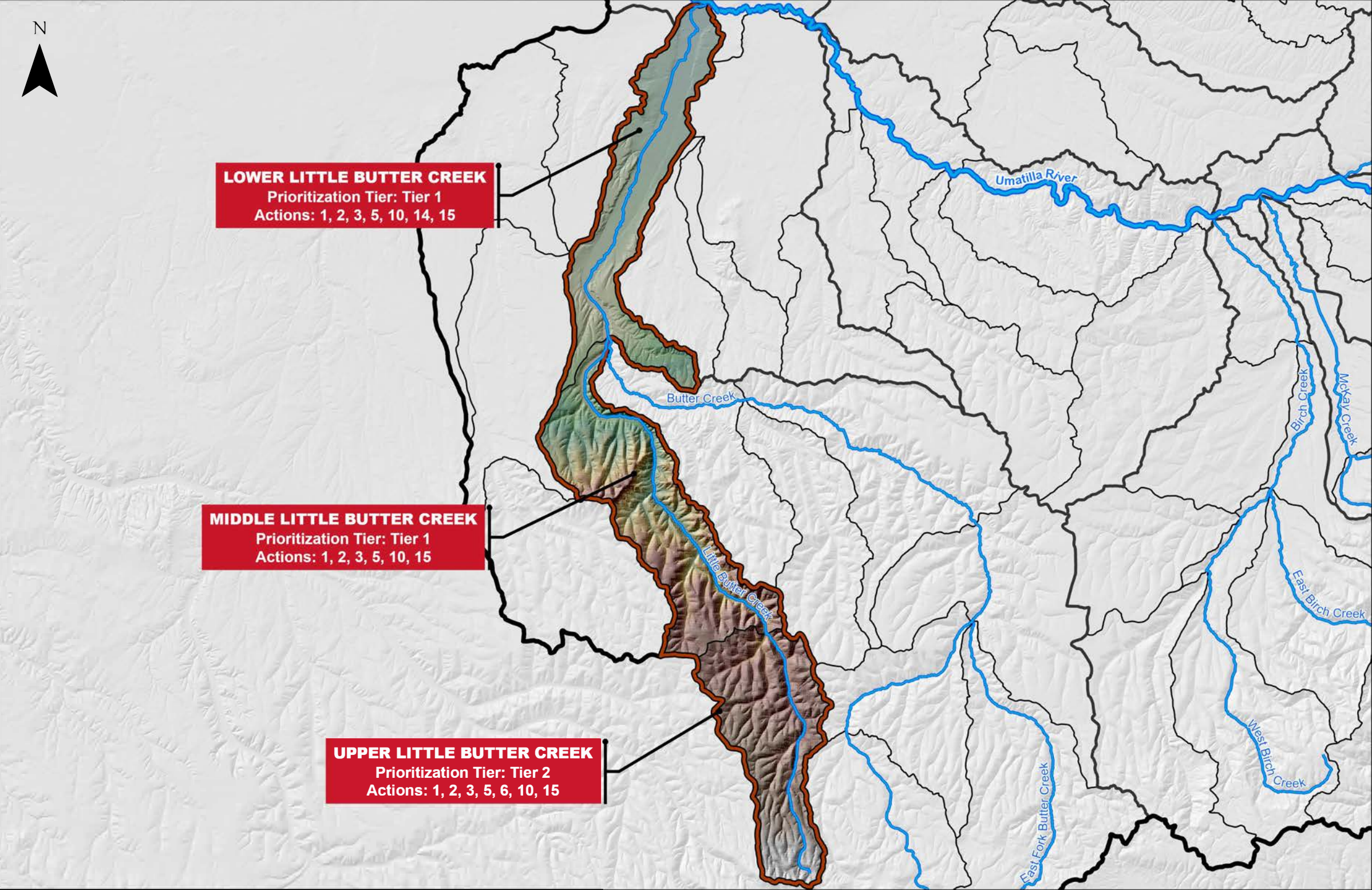


Watershed Opportunities

HUC10 Watershed Name:  
Lower Butter Creek Watershed

All Potential Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (3) Reduce - Mitigate Point or Non-Point Source Impacts
- (4) Nutrients Additions (carcasses)
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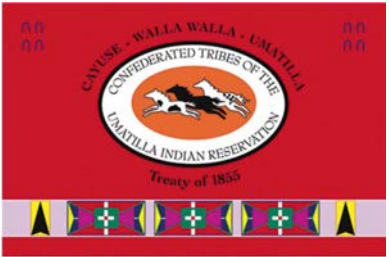
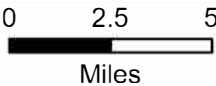
Legend

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- HUC8 Major Streams
- Umatilla Subbasin
- HUC10 Watersheds
- HUC12 Subwatersheds
- Watershed in focus



Umatilla River Assessment  
Subbasin Uplands Map Book

Lower Butter Creek Watershed  
Restoration Actions



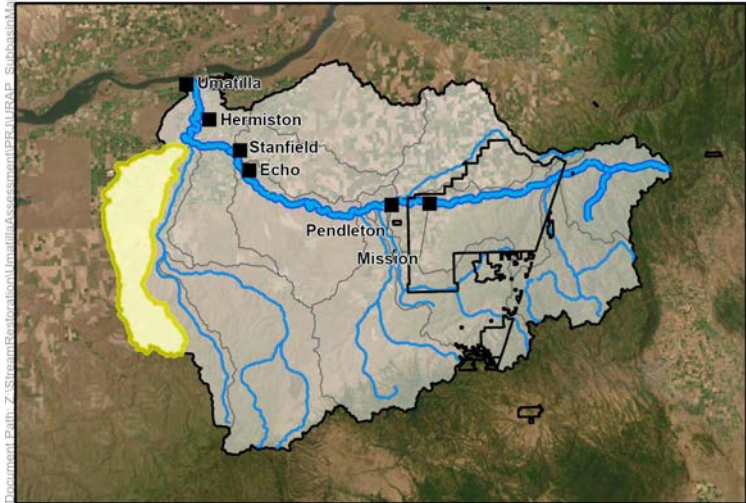
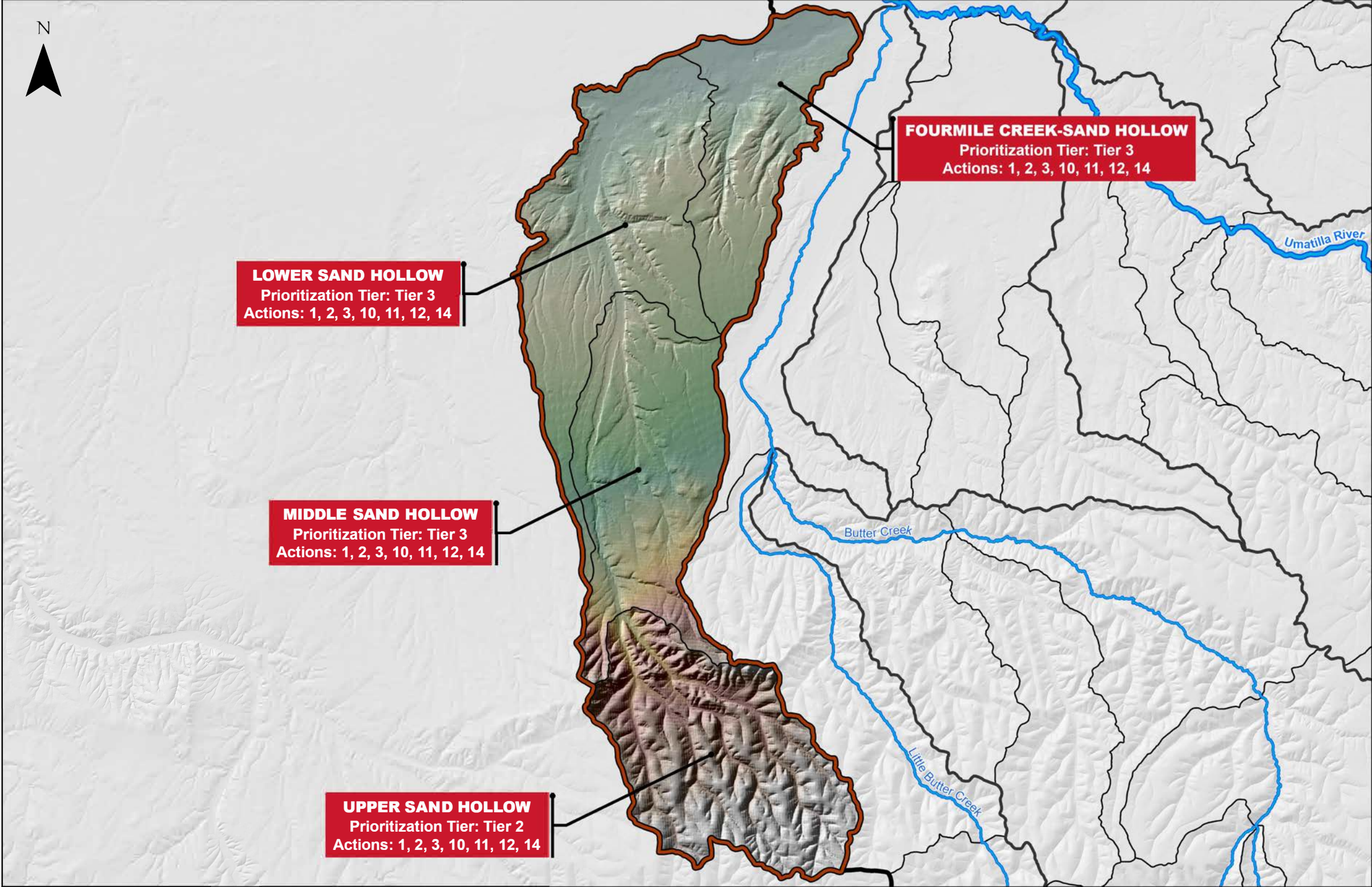


Watershed Opportunities

HUC10 Watershed Name:  
Sand Hollow Watershed

All Potential Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (3) Reduce - Mitigate Point or Non-Point Source Impacts
- (4) Nutrients Additions (carcasses)
- (5) Upland Vegetation Treatment - Management
- (6) Road Grading - Drainage Improvements
- (7) Road Decommissioning or Abandonment
- (8) Water Management-Improve Irrigation Efficiency
- (9) Acquire or Increase Instream Flow (Lease/Purchase; GW Storage)
- (10) Remove Non-native Plants
- (11) Off--Site Water Developments
- (12) Riparian Buffer Strip, Planting
- (13) Selective Thinning
- (14) Beaver Re-introduction or Management
- (15) Riparian Fencing



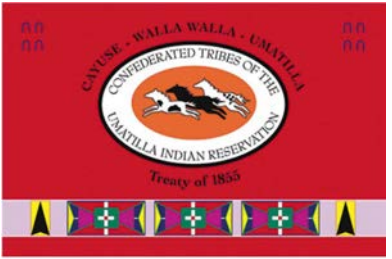
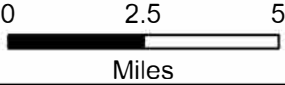
Legend

- 2020 Umatilla River Centerline
- HUC8 Major Streams
- Umatilla Subbasin
- HUC10 Watersheds
- HUC12 Subwatersheds
- Watershed in focus



Umatilla River Assessment  
Subbasin Uplands Map Book

Sand Hollow Watershed  
Restoration Actions



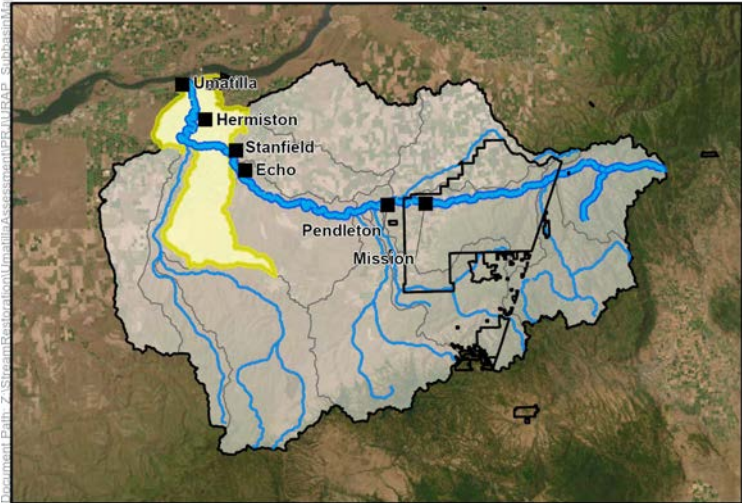
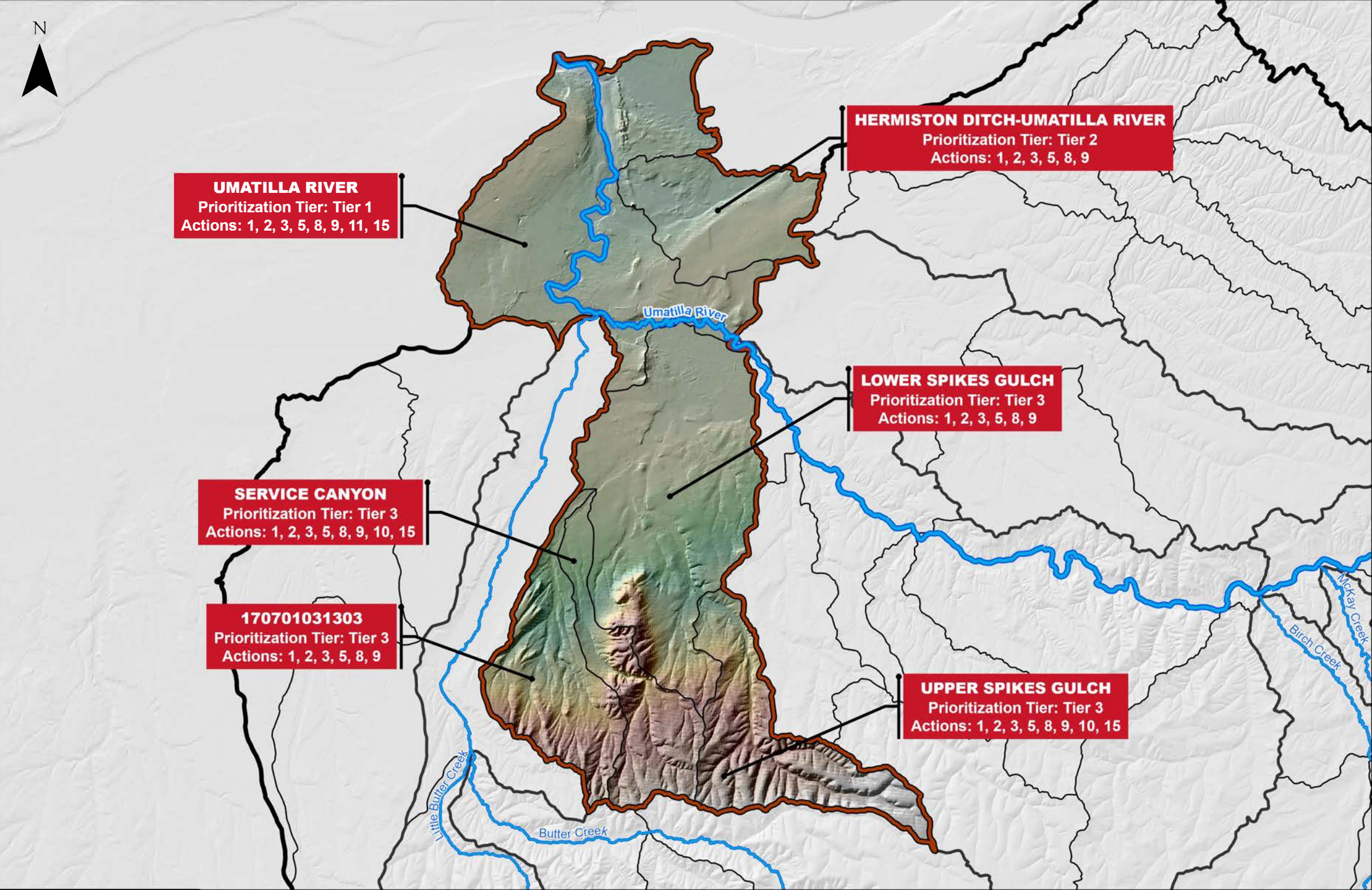


Watershed Opportunities

HUC10 Watershed Name:  
Hunt Ditch-Umatilla River Watershed

All Potential Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (3) Reduce - Mitigate Point or Non-Point Source Impacts
- (4) Nutrients Additions (carcasses)
- (5) Upland Vegetation Treatment - Management
- (6) Road Grading - Drainage Improvements
- (7) Road Decommissioning or Abandonment
- (8) Water Management-Improve Irrigation Efficiency
- (9) Acquire or Increase Instream Flow (Lease/Purchase; GW Storage)
- (10) Remove Non-native Plants
- (11) Off--Site Water Developments
- (12) Riparian Buffer Strip, Planting
- (13) Selective Thinning
- (14) Beaver Re-introduction or Management
- (15) Riparian Fencing



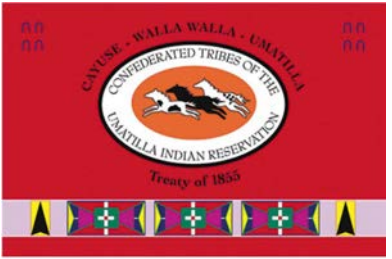
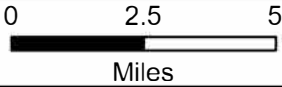
Legend

- 2020 Umatilla River Centerline
- HUC8 Major Streams
- Umatilla Subbasin
- HUC10 Watersheds
- HUC12 Subwatersheds
- Watershed in focus



Umatilla River Assessment  
Subbasin Uplands Map Book

Hunt Ditch-Umatilla River Watershed  
Restoration Actions





## UMATILLA RIVER

# Action Plan- Appendix B

## Umatilla River Reach by Reach Actions



CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION



Reach Opportunities

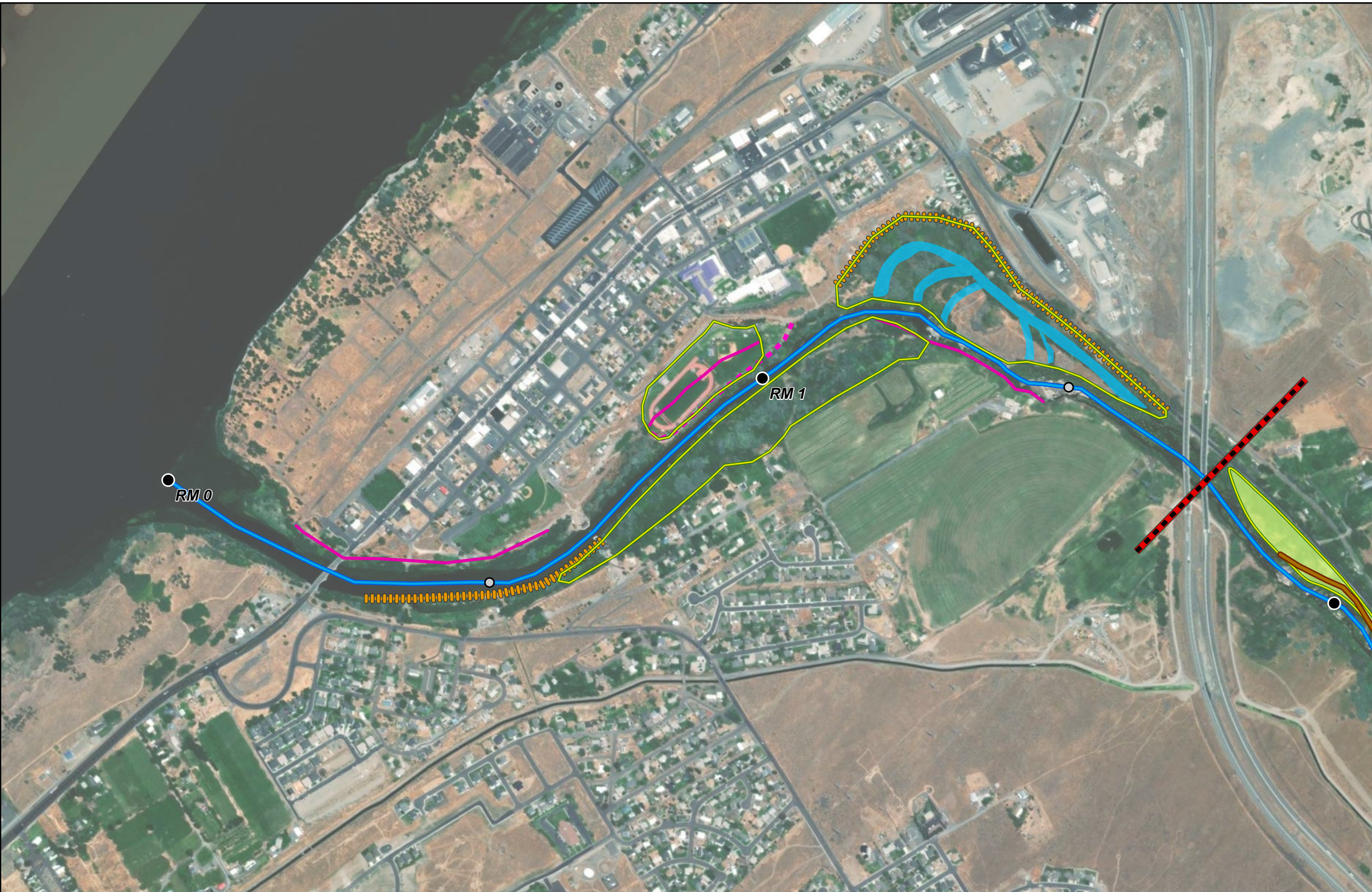
Reach Name: UM1

Prioritization Tier:

Tier 3

Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (9) Acquire or Increase Instream Flow (Lease/Purchase; GW Storage)
- (16) Bank Shaping and Stabilization
- (17) Removal of Bank Armoring
- (18) Restore Banklines with LWD - Bioengineering
- (37) Channel Reconstruction



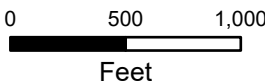
Legend

- River Miles (1.0)
  - River Miles (0.5)
  - 2020 Centerline
  - ▬ Reach Boundary
  - Improve Thermal Refugia
  - Dam Removal
- Restore Banklines with LWD
  - LWD Placements
  - Side Channel
  - Hyporheic Off-Channel Habitat
  - Riparian Fencing
  - Bank Shaping and Stabilization
  - Removal of Bank Armoring
  - Levee Modification
- Protection
  - Channel Reconstruction
  - Floodplain Pond
  - Remove and/or Relocate Floodplain Infrastructure
  - Wetland Restoration\*
  - Riparian Buffer Planting
  - Restore Floodplain Topography and Vegetation
  - Upland Vegetation Treatment
  - Floodplain Excavation
  - Alcove

\*based on NWI Existing Wetlands (2023)

Umatilla River Assessment  
Reach-by-Reach Map Book

Reach UM1  
Restoration Actions





Reach Opportunities

Reach Name: UM2

Prioritization Tier:

Tier 2

Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (11) Off--Site Water Developments
- (20) LWD Placements - Individual Whole Trees, Logjams, etc.
- (24) Restoration of Floodplain Topography and Vegetation



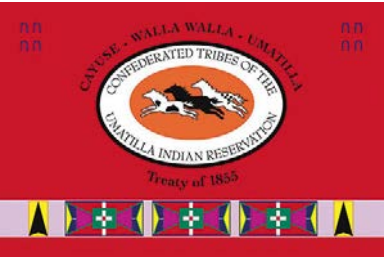
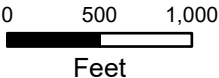
Legend

- River Miles (1.0)
  - River Miles (0.5)
  - 2020 Centerline
  - ▬ Reach Boundary
  - Improve Thermal Refugia
  - Dam Removal
- Restore Banklines with LWD
  - LWD Placements
  - Side Channel
  - Hyporheic Off-Channel Habitat
  - Riparian Fencing
  - Bank Shaping and Stabilization
  - Removal of Bank Armoring
  - Levee Modification
- Protection
  - Channel Reconstruction
  - Floodplain Pond
  - Remove and/or Relocate Floodplain Infrastructure
  - Wetland Restoration\*
  - Riparian Buffer Planting
  - Restore Floodplain Topography and Vegetation
  - Upland Vegetation Treatment
  - Floodplain Excavation
  - Alcove

\*based on NWI Existing Wetlands (2023)

Umatilla River Assessment  
Reach-by-Reach Map Book

Reach UM2  
Restoration Actions





Reach Opportunities

Reach Name: UM3

Prioritization Tier:

Tier 2

Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (14) Beaver Re-introduction or Management
- (16) Bank Shaping and Stabilization
- (17) Removal of Bank Armoring
- (18) Restore Banklines with LWD - Bioengineering



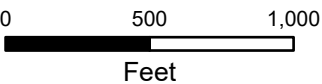
Legend

- River Miles (1.0)
  - River Miles (0.5)
  - 2020 Centerline
  - ▬ Reach Boundary
  - Improve Thermal Refugia
  - Dam Removal
- Restore Banklines with LWD
  - LWD Placements
  - Side Channel
  - Hyporheic Off-Channel Habitat
  - Riparian Fencing
  - Bank Shaping and Stabilization
  - Removal of Bank Armoring
  - Levee Modification
- Protection
  - Channel Reconstruction
  - Floodplain Pond
  - Remove and/or Relocate Floodplain Infrastructure
  - Wetland Restoration\*
  - Riparian Buffer Planting
  - Restore Floodplain Topography and Vegetation
  - Upland Vegetation Treatment
  - Floodplain Excavation
  - Alcove

\*based on NWI Existing Wetlands (2023)

Umatilla River Assessment  
Reach-by-Reach Map Book

Reach UM3  
Restoration Actions





# Reach Opportunities

Reach Name: UM4

Prioritization Tier:

Tier 1

## Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (14) Beaver Re-introduction or Management
- (15) Riparian Fencing
- (19) Boulder Placements
- (20) LWD Placements - Individual
- Whole Trees, Logjams, etc.
- (22) Levee Modifications: Removal, Setback, Breach



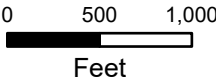
## Legend

- River Miles (1.0)
  - River Miles (0.5)
  - 2020 Centerline
  - ▬ Reach Boundary
  - Improve Thermal Refugia
  - Dam Removal
- Restore Banklines with LWD
  - LWD Placements
  - Side Channel
  - Hyporheic Off-Channel Habitat
  - Riparian Fencing
  - Bank Shaping and Stabilization
  - Removal of Bank Armoring
  - Levee Modification
- Protection
  - Channel Reconstruction
  - Floodplain Pond
  - Remove and/or Relocate Floodplain Infrastructure
  - Wetland Restoration\*
  - Riparian Buffer Planting
  - Restore Floodplain Topography and Vegetation
  - Upland Vegetation Treatment
  - Floodplain Excavation
  - Alcove

\*based on NWI Existing Wetlands (2023)

## Umatilla River Assessment Reach-by-Reach Map Book

Reach UM4  
Restoration Actions





Reach Opportunities

Reach Name: UM5

Prioritization Tier:

Tier 3

Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (8) Water Management-Improve Irrigation Efficiency
- (9) Acquire or Increase Instream Flow (Lease/Purchase; GW Storage)
- (26) Improve Thermal Refugia (reconnect cold springs, winter temps)



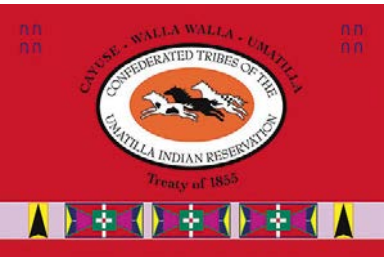
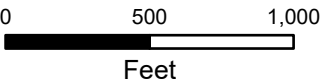
Legend

- River Miles (1.0)
- River Miles (0.5)
- 2020 Centerline
- Reach Boundary
- Improve Thermal Refugia
- Dam Removal
- Restore Banklines with LWD
- LWD Placements
- Side Channel
- Hyporheic Off-Channel Habitat
- Riparian Fencing
- Bank Shaping and Stabilization
- Removal of Bank Armoring
- Levee Modification
- Protection
- Channel Reconstruction
- Floodplain Pond
- Remove and/or Relocate Floodplain Infrastructure
- Wetland Restoration\*
- Riparian Buffer Planting
- Restore Floodplain Topography and Vegetation
- Upland Vegetation Treatment
- Floodplain Excavation
- Alcove

\*based on NWI Existing Wetlands (2023)

Umatilla River Assessment  
Reach-by-Reach Map Book

Reach UM5  
Restoration Actions





Reach Opportunities

Reach Name: UM6

Prioritization Tier:

Tier 1

Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (8) Water Management-Improve Irrigation Efficiency
- (9) Acquire or Increase Instream Flow (Lease/Purchase; GW Storage)
- (12) Riparian Buffer Strip, Planting
- (14) Beaver Re-introduction or Management



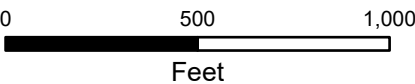
Legend

- River Miles (1.0)
  - River Miles (0.5)
  - 2020 Centerline
  - ▬ Reach Boundary
  - Improve Thermal Refugia
  - Dam Removal
- Restore Banklines with LWD
  - LWD Placements
  - Side Channel
  - Hyporheic Off-Channel Habitat
  - Riparian Fencing
  - Bank Shaping and Stabilization
  - Removal of Bank Armoring
  - Levee Modification
- Protection
  - Channel Reconstruction
  - Floodplain Pond
  - Remove and/or Relocate Floodplain Infrastructure
  - Wetland Restoration\*
  - Riparian Buffer Planting
  - Restore Floodplain Topography and Vegetation
  - Upland Vegetation Treatment
  - Floodplain Excavation
  - Alcove

\*based on NWI Existing Wetlands (2023)

Umatilla River Assessment  
Reach-by-Reach Map Book

Reach UM6  
Restoration Actions





# Reach Opportunities

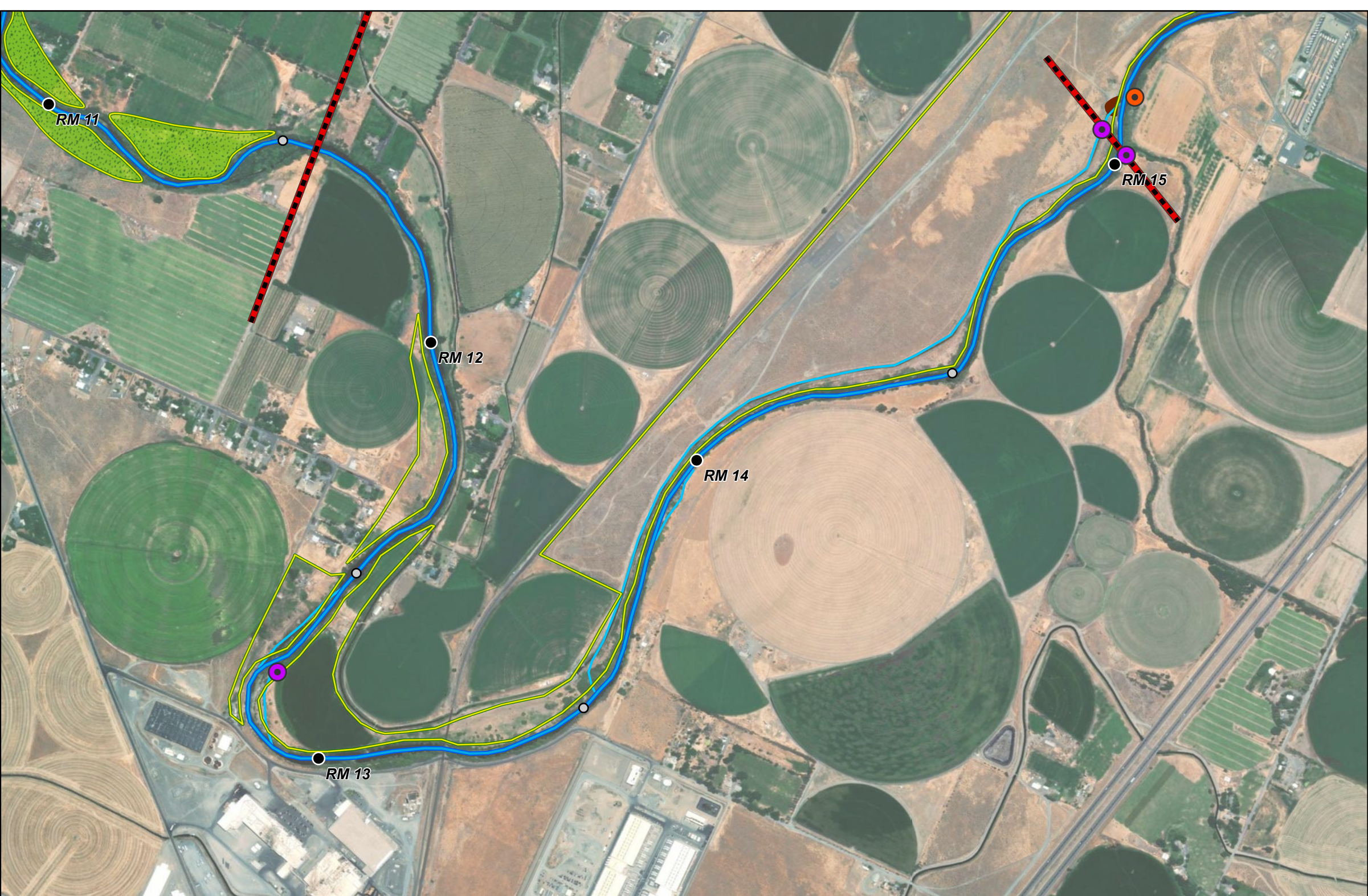
Reach Name: UM7

Prioritization Tier:

Tier 2

## Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (8) Water Management-Improve Irrigation Efficiency
- (9) Acquire or Increase Instream Flow (Lease/Purchase; GW Storage)
- (14) Beaver Re-introduction or Management
- (26) Improve Thermal Refugia (reconnect cold springs, winter temps)
- (27) Perennial Side Channel
- (28) Secondary Channel (non-perennial)



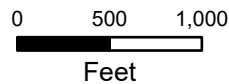
## Legend

- River Miles (1.0)
- River Miles (0.5)
- 2020 Centerline
- Reach Boundary
- Improve Thermal Refugia
- Dam Removal
- Restore Banklines with LWD
- LWD Placements
- Side Channel
- Hyporheic Off-Channel Habitat
- Riparian Fencing
- Bank Shaping and Stabilization
- Removal of Bank Armoring
- Levee Modification
- Protection
- Channel Reconstruction
- Floodplain Pond
- Remove and/or Relocate Floodplain Infrastructure
- Wetland Restoration\*
- Riparian Buffer Planting
- Restore Floodplain Topography and Vegetation
- Upland Vegetation Treatment
- Floodplain Excavation
- Alcove

\*based on NWI Existing Wetlands (2023)

## Umatilla River Assessment Reach-by-Reach Map Book

Reach UM7  
Restoration Actions





Reach Opportunities

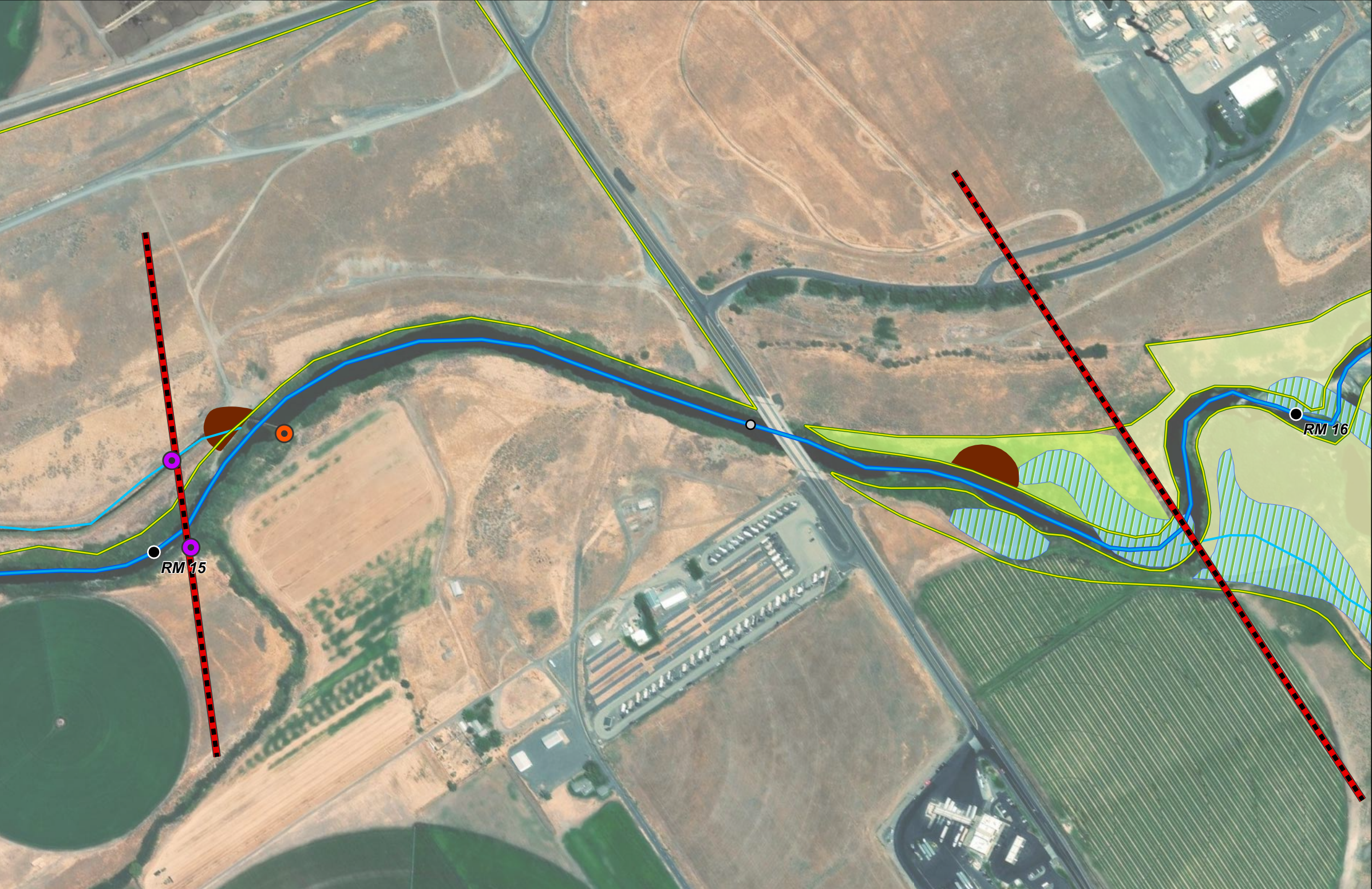
Reach Name: UM8

Prioritization Tier:

Tier 2

Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (14) Beaver Re-introduction or Management
- (30) Wetland
- (31) Alcove
- (40) Dam Removal or Breaching



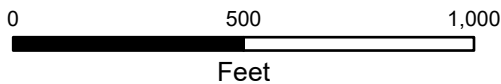
Legend

- River Miles (1.0)
  - River Miles (0.5)
  - 2020 Centerline
  - ▬ Reach Boundary
  - Improve Thermal Refugia
  - Dam Removal
- Restore Banklines with LWD
  - LWD Placements
  - Side Channel
  - Hyporheic Off-Channel Habitat
  - Riparian Fencing
  - Bank Shaping and Stabilization
  - Removal of Bank Armoring
  - Levee Modification
- Protection
  - Channel Reconstruction
  - Floodplain Pond
  - Remove and/or Relocate Floodplain Infrastructure
  - Wetland Restoration\*
  - Riparian Buffer Planting
  - Restore Floodplain Topography and Vegetation
  - Upland Vegetation Treatment
  - Floodplain Excavation
  - Alcove

\*based on NWI Existing Wetlands (2023)

Umatilla River Assessment  
Reach-by-Reach Map Book

Reach UM8  
Restoration Actions





Reach Opportunities

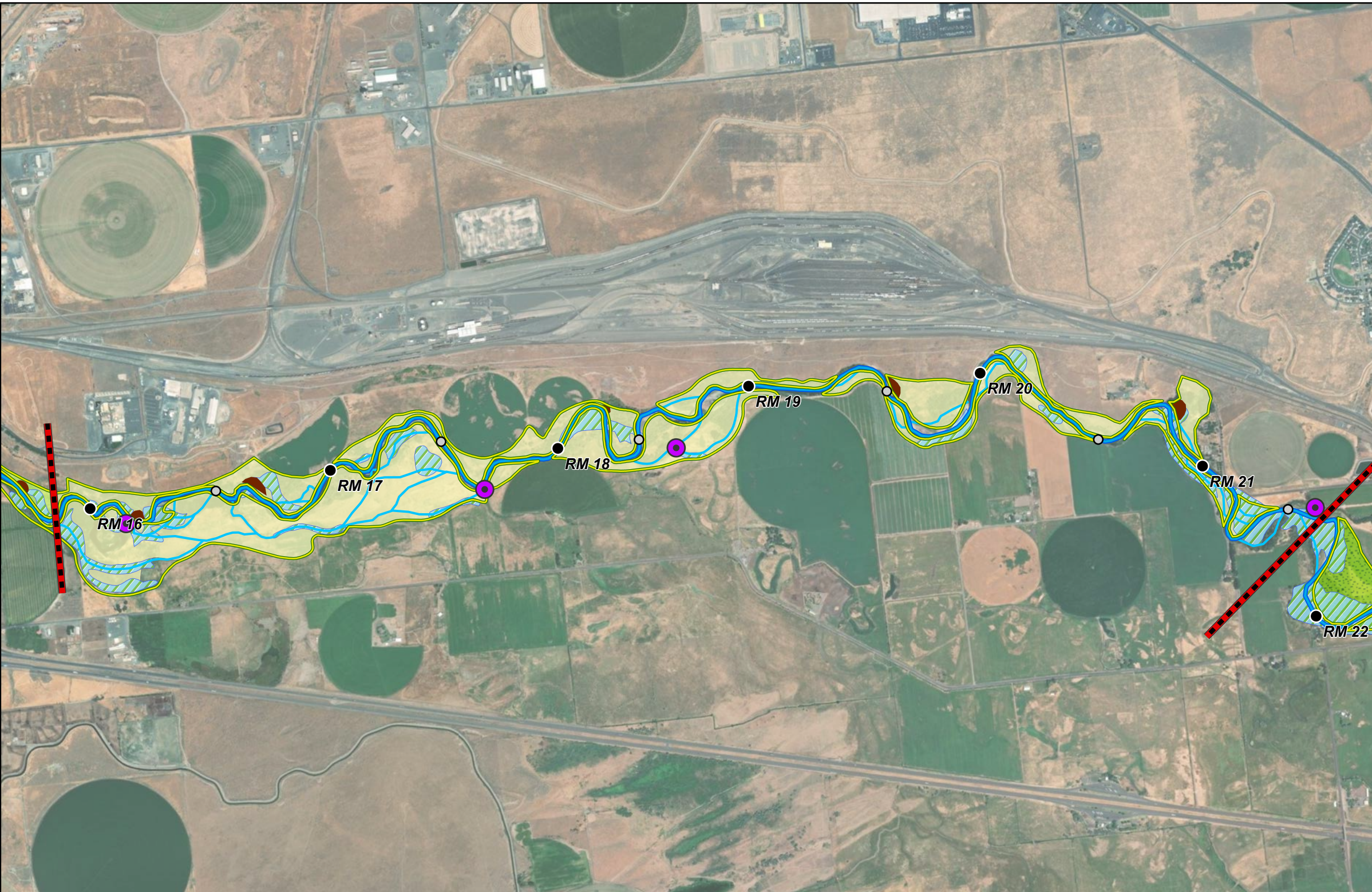
Reach Name: UM9

Prioritization Tier:

Tier 2

Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (25) Floodplain Excavation: Benching
- (26) Improve Thermal Refugia (reconnect cold springs, winter temps)
- (30) Wetland
- (31) Alcove
- (36) Meander (Oxbow) Re-connect - Reconstruction
- (38) Structural Passage (Diversions, Screening)
- (40) Dam Removal or Breaching



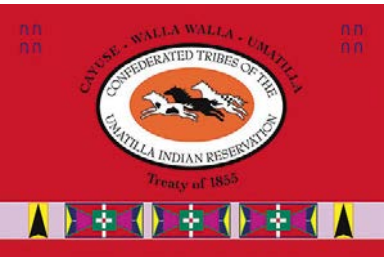
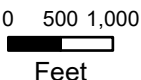
Legend

- River Miles (1.0)
  - River Miles (0.5)
  - 2020 Centerline
  - Reach Boundary
  - Improve Thermal Refugia
  - Dam Removal
- Restore Banklines with LWD
  - LWD Placements
  - Side Channel
  - Hyporheic Off-Channel Habitat
  - Riparian Fencing
  - Bank Shaping and Stabilization
  - Removal of Bank Armoring
  - Levee Modification
- Protection
  - Channel Reconstruction
  - Floodplain Pond
  - Remove and/or Relocate Floodplain Infrastructure
  - Wetland Restoration\*
  - Riparian Buffer Planting
  - Restore Floodplain Topography and Vegetation
  - Upland Vegetation Treatment
  - Floodplain Excavation
  - Alcove

\*based on NWI Existing Wetlands (2023)

Umatilla River Assessment  
Reach-by-Reach Map Book

Reach UM9  
Restoration Actions





# Reach Opportunities

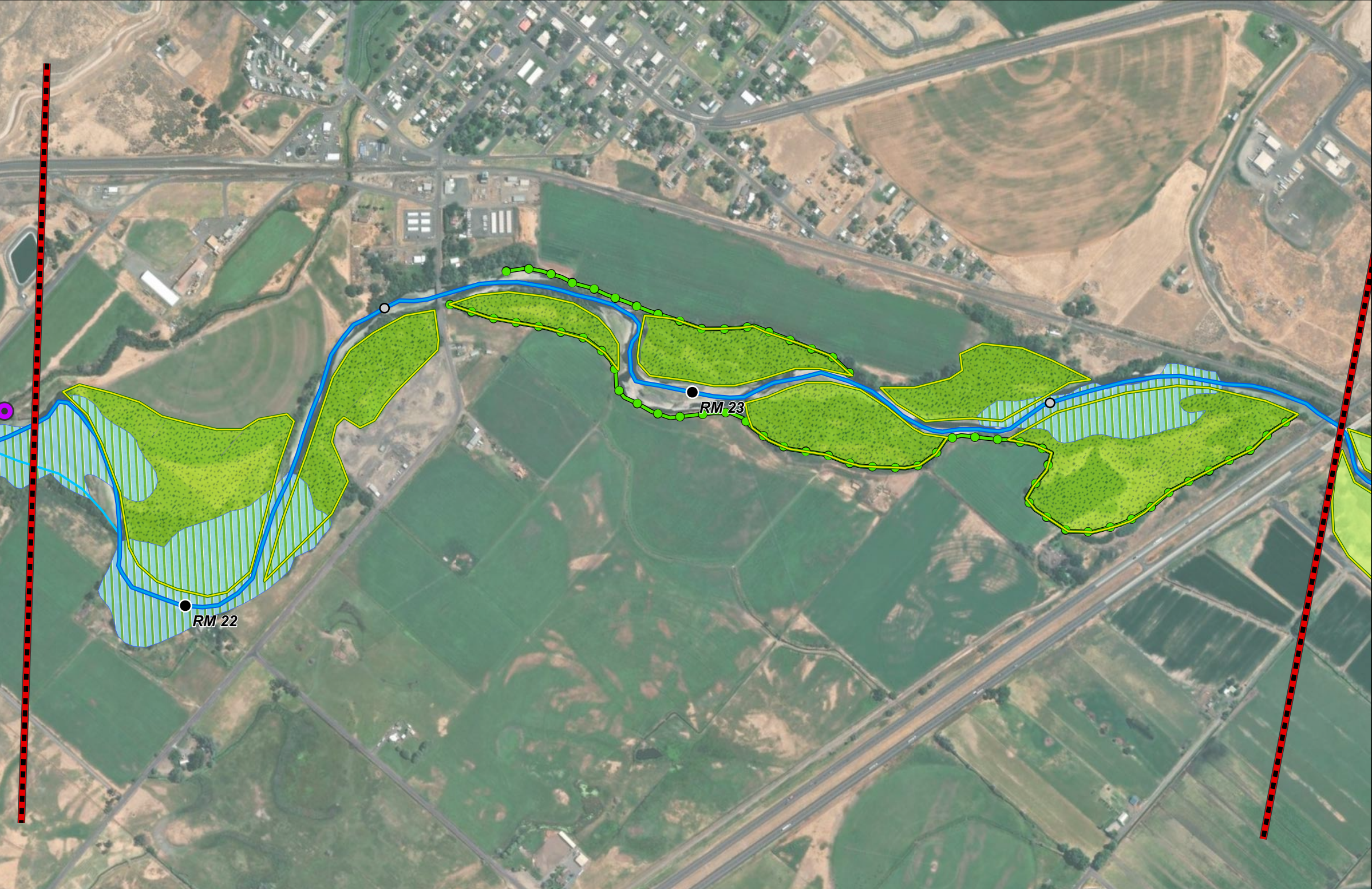
Reach Name: UM10

Prioritization Tier:

Tier 1

## Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (6) Road Grading - Drainage Improvements
- (8) Water Management-Improve Irrigation Efficiency
- (9) Acquire or Increase Instream Flow (Lease/Purchase; GW Storage)
- (12) Riparian Buffer Strip, Planting
- (15) Riparian Fencing
- (30) Wetland



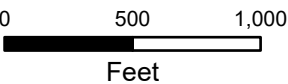
## Legend

- |                           |                                |  |
|---------------------------|--------------------------------|--|
| ● River Miles (1.0)       | Restore Banklines with LWD     | Protection                                       |
| ○ River Miles (0.5)       | LWD Placements                 | Channel Reconstruction                           |
| — 2020 Centerline         | Side Channel                   | Floodplain Pond                                  |
| — Reach Boundary          | Hyporheic Off-Channel Habitat  | Remove and/or Relocate Floodplain Infrastructure |
| ● Improve Thermal Refugia | Riparian Fencing               | Wetland Restoration*                             |
| ● Dam Removal             | Bank Shaping and Stabilization | Riparian Buffer Planting                         |
|                           | Removal of Bank Armoring       | Restore Floodplain Topography and Vegetation     |
|                           | Levee Modification             | Upland Vegetation Treatment                      |
|                           |                                | Floodplain Excavation                            |
|                           |                                | Alcove   |

\*based on NWI Existing Wetlands (2023)

## Umatilla River Assessment Reach-by-Reach Map Book

Reach UM10  
Restoration Actions





Reach Opportunities

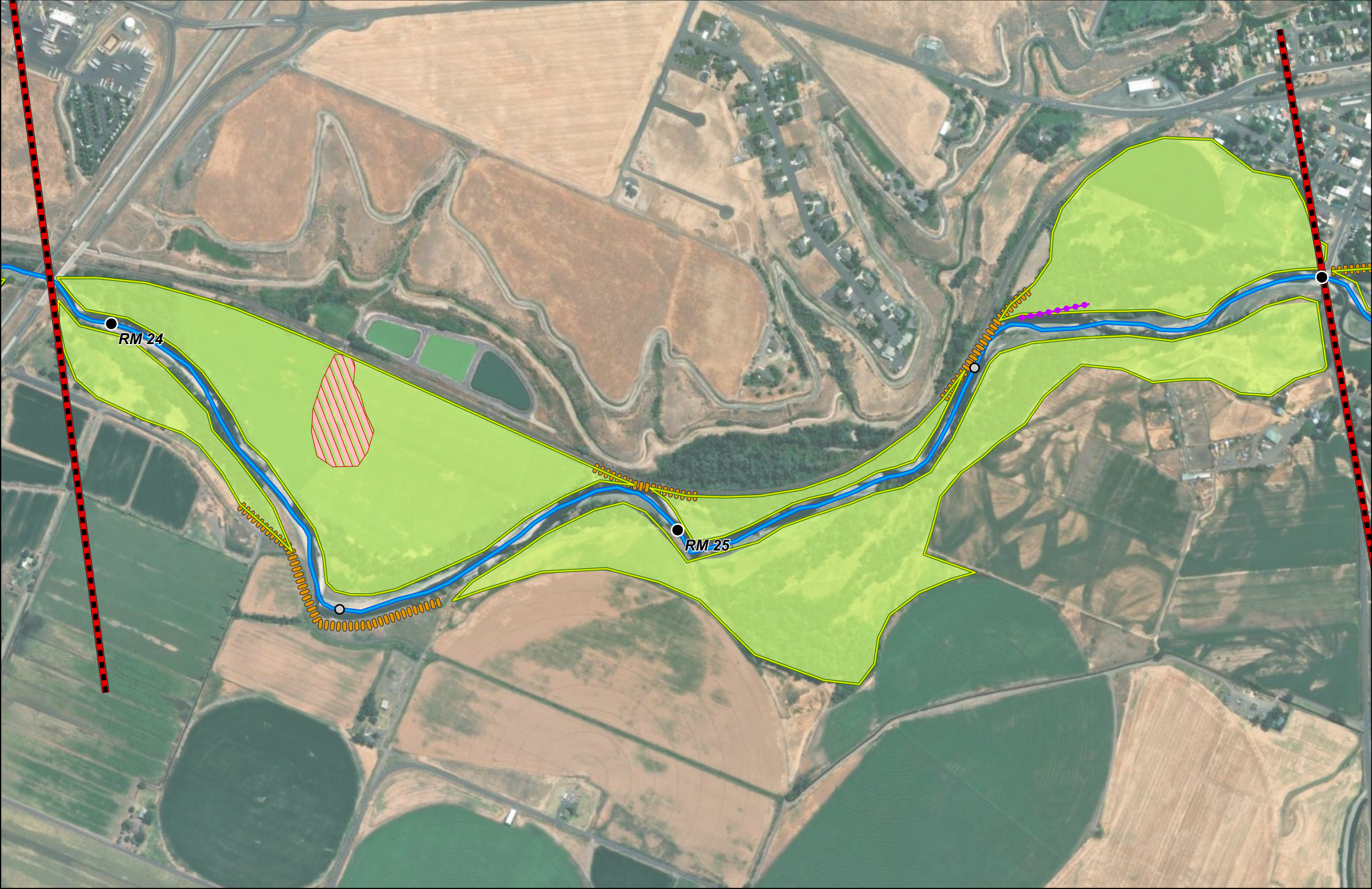
Reach Name: UM11

Prioritization Tier:

Tier 1

Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (22) Levee Modifications: Removal, Setback, Breach
- (23) Remove and/or Relocate Floodplain Infrastructure
- (24) Restoration of Floodplain Topography and Vegetation
- (18) Restore Banklines with LWD - Bioengineering



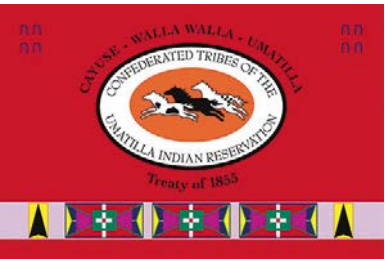
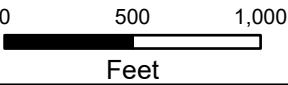
Legend

- River Miles (1.0)
  - River Miles (0.5)
  - 2020 Centerline
  - ▬ Reach Boundary
  - Improve Thermal Refugia
  - Dam Removal
- Restore Banklines with LWD
  - LWD Placements
  - Side Channel
  - Hyporheic Off-Channel Habitat
  - Riparian Fencing
  - Bank Shaping and Stabilization
  - Removal of Bank Armoring
  - Levee Modification
- Protection
  - Channel Reconstruction
  - Floodplain Pond
  - Remove and/or Relocate Floodplain Infrastructure
  - Wetland Restoration\*
  - Riparian Buffer Planting
  - Restore Floodplain Topography and Vegetation
  - Upland Vegetation Treatment
  - Floodplain Excavation
  - Alcove

\*based on NWI Existing Wetlands (2023)

Umatilla River Assessment  
Reach-by-Reach Map Book

Reach UM11  
Restoration Actions





Reach Opportunities

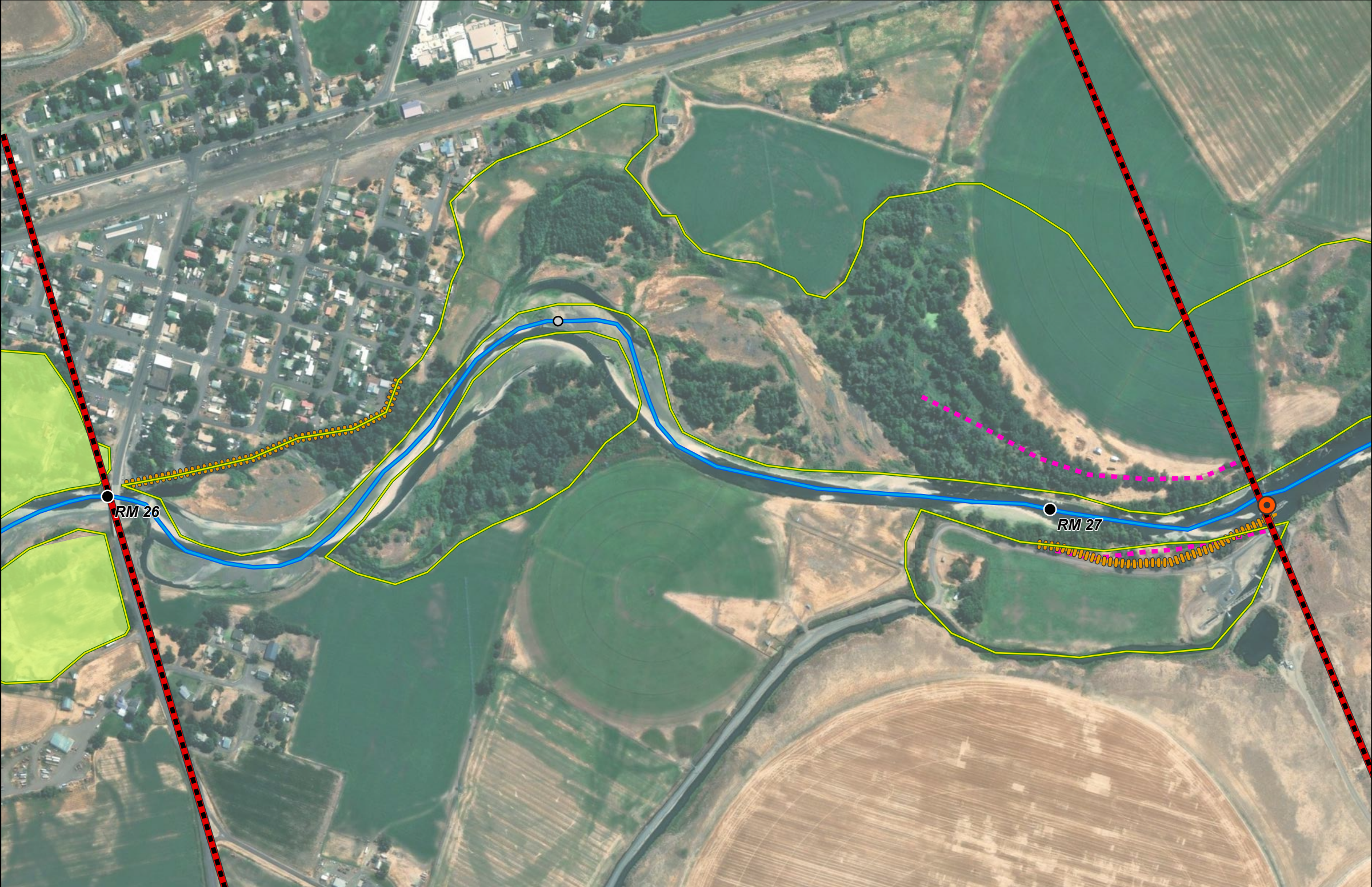
Reach Name: UM12

Prioritization Tier:

Tier 3

Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (17) Removal of Bank Armoring
- (18) Restore Banklines with LWD - Bioengineering
- (40) Dam Removal or Breaching



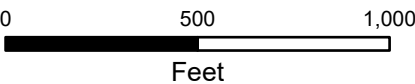
Legend

- River Miles (1.0)
  - River Miles (0.5)
  - 2020 Centerline
  - Reach Boundary
  - Improve Thermal Refugia
  - Dam Removal
- Restore Banklines with LWD
  - LWD Placements
  - Side Channel
  - Hyporheic Off-Channel Habitat
  - Riparian Fencing
  - Bank Shaping and Stabilization
  - Removal of Bank Armoring
  - Levee Modification
- Protection
  - Channel Reconstruction
  - Floodplain Pond
  - Remove and/or Relocate Floodplain Infrastructure
  - Wetland Restoration\*
  - Riparian Buffer Planting
  - Restore Floodplain Topography and Vegetation
  - Upland Vegetation Treatment
  - Floodplain Excavation
  - Alcove

\*based on NWI Existing Wetlands (2023)

Umatilla River Assessment  
Reach-by-Reach Map Book

Reach UM12  
Restoration Actions





Reach Opportunities

Reach Name: UM13

Prioritization Tier:

Tier 1

Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (8) Water Management-Improve Irrigation Efficiency
- (20) LWD Placements - Individual Whole Trees, Logjams, etc.
- (22) Levee Modifications: Removal, Setback, Breach
- (24) Restoration of Floodplain Topography and Vegetation
- (27) Perennial Side Channel
- (28) Secondary Channel (non-perennial)



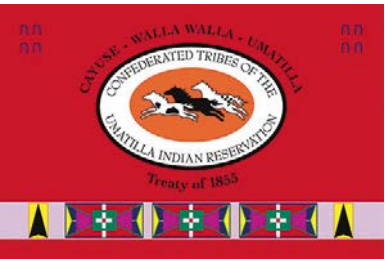
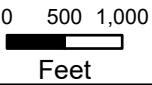
Legend

- River Miles (1.0)
  - River Miles (0.5)
  - 2020 Centerline
  - Reach Boundary
  - Improve Thermal Refugia
  - Dam Removal
- Restore Banklines with LWD
  - LWD Placements
  - Side Channel
  - Hyporheic Off-Channel Habitat
  - Riparian Fencing
  - Bank Shaping and Stabilization
  - Removal of Bank Armoring
  - Levee Modification
- Protection
  - Channel Reconstruction
  - Floodplain Pond
  - Remove and/or Relocate Floodplain Infrastructure
  - Wetland Restoration\*
  - Riparian Buffer Planting
  - Restore Floodplain Topography and Vegetation
  - Upland Vegetation Treatment
  - Floodplain Excavation
  - Alcove

\*based on NWI Existing Wetlands (2023)

Umatilla River Assessment  
Reach-by-Reach Map Book

Reach UM13  
Restoration Actions





## Reach Opportunities

**Reach Name:** UM14

Prioritization Tier:	
Tier 1	

#### Restoration Actions:

(1) Protection: (Acquisitions, Easements, Coop. Agreements)

(2) Land Management: (Grazing Plans, Fire management, etc.)

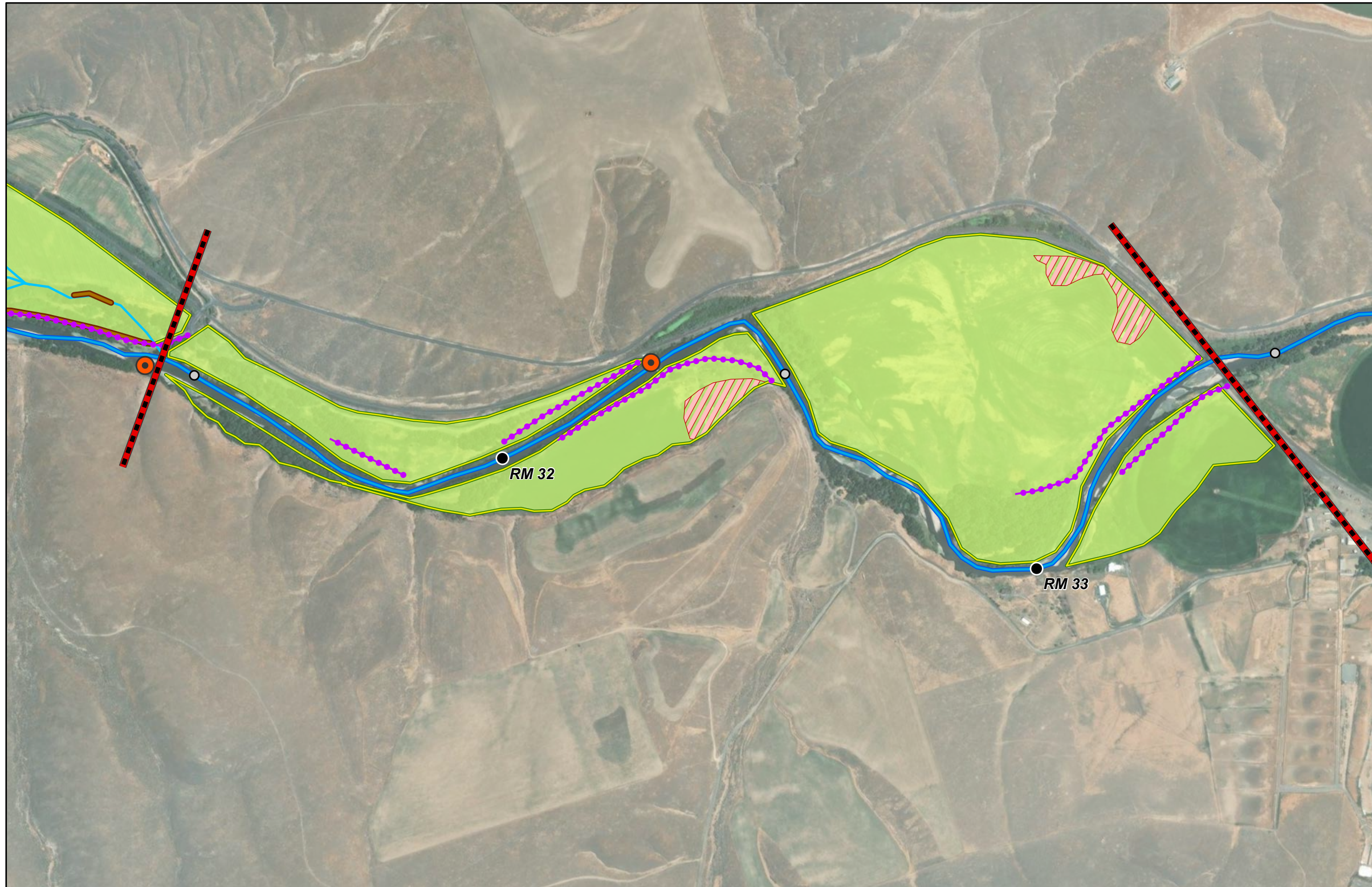
(22) Levee Modifications: Removal, Setback, Breach

(23) Remove and/or Relocate Floodplain Infrastructure























## (24) Restoration of Floodplain Topography and Vegetation

(38) Structural Passage (Diversions, Screening)

(40) Dam Removal or Breaching



### Legend

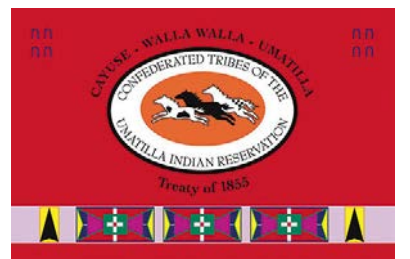
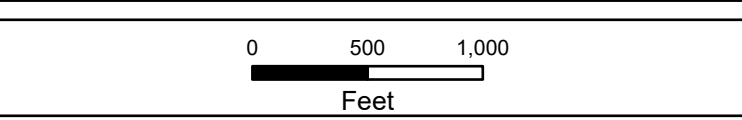
● River Miles (1.0)	 Restore Banklines with LWD	 Protection
○ River Miles (0.5)	 LWD Placements	 Channel Reconstruction
 2020 Centerline	 Side Channel	 Floodplain Pond
 Reach Boundary	 Hyporheic Off-Channel Habitat	 Remove and/or Relocate Floodplain Infrastructure
 Improve Thermal Refugia	 Riparian Fencing	 Wetland Restoration*
 Dam Removal	 Bank Shaping and Stabilization	 Riparian Buffer Planting
	 Removal of Bank Armoring	 Restore Floodplain Topography and Vegetation
	 Levee Modification	 Upland Vegetation Treatment
		 Floodplain Excavation
		 Alcove

*\*based on NWI Existing Wetlands (2023)*

- \*based on NWI Existing Wetlands (2023)*

# Umatilla River Assessment Reach-by-Reach Map Book

## Reach UM14 Restoration Actions





# Reach Opportunities

Reach Name: UM15

Prioritization Tier:

Tier 1

## Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (8) Water Management-Improve Irrigation Efficiency
- (9) Acquire or Increase Instream Flow (Lease/Purchase; GW Storage)
- (12) Riparian Buffer Strip, Planting
- (38) Structural Passage (Diversions, Screening)



## Legend

- River Miles (1.0)
- River Miles (0.5)
- 2020 Centerline
- Reach Boundary
- Improve Thermal Refugia
- Dam Removal
- Restore Banklines with LWD
- LWD Placements
- Side Channel
- Hyporheic Off-Channel Habitat
- Riparian Fencing
- Bank Shaping and Stabilization
- Removal of Bank Armoring
- Levee Modification
- Protection
- Channel Reconstruction
- Floodplain Pond
- Remove and/or Relocate Floodplain Infrastructure
- Wetland Restoration\*
- Riparian Buffer Planting
- Restore Floodplain Topography and Vegetation
- Upland Vegetation Treatment
- Floodplain Excavation
- Alcove

\*based on NWI Existing Wetlands (2023)

## Umatilla River Assessment Reach-by-Reach Map Book

Reach UM15  
Restoration Actions

0 500 1,000  
Feet



TETRA TECH



Reach Opportunities

Reach Name: UM16

Prioritization Tier:

Tier 3

Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (8) Water Management-Improve Irrigation Efficiency
- (9) Acquire or Increase Instream Flow (Lease/Purchase; GW Storage)
- (11) Off-Site Water Developments



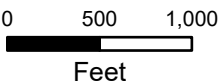
Legend

- River Miles (1.0)
  - River Miles (0.5)
  - 2020 Centerline
  - Reach Boundary
  - Improve Thermal Refugia
  - Dam Removal
- Restore Banklines with LWD
  - LWD Placements
  - Side Channel
  - Hyporheic Off-Channel Habitat
  - Riparian Fencing
  - Bank Shaping and Stabilization
  - Removal of Bank Armoring
  - Levee Modification
- Protection
  - Channel Reconstruction
  - Floodplain Pond
  - Remove and/or Relocate Floodplain Infrastructure
  - Wetland Restoration\*
  - Riparian Buffer Planting
  - Restore Floodplain Topography and Vegetation
  - Upland Vegetation Treatment
  - Floodplain Excavation
  - Alcove

\*based on NWI Existing Wetlands (2023)

Umatilla River Assessment  
Reach-by-Reach Map Book

Reach UM16  
Restoration Actions





Reach Opportunities

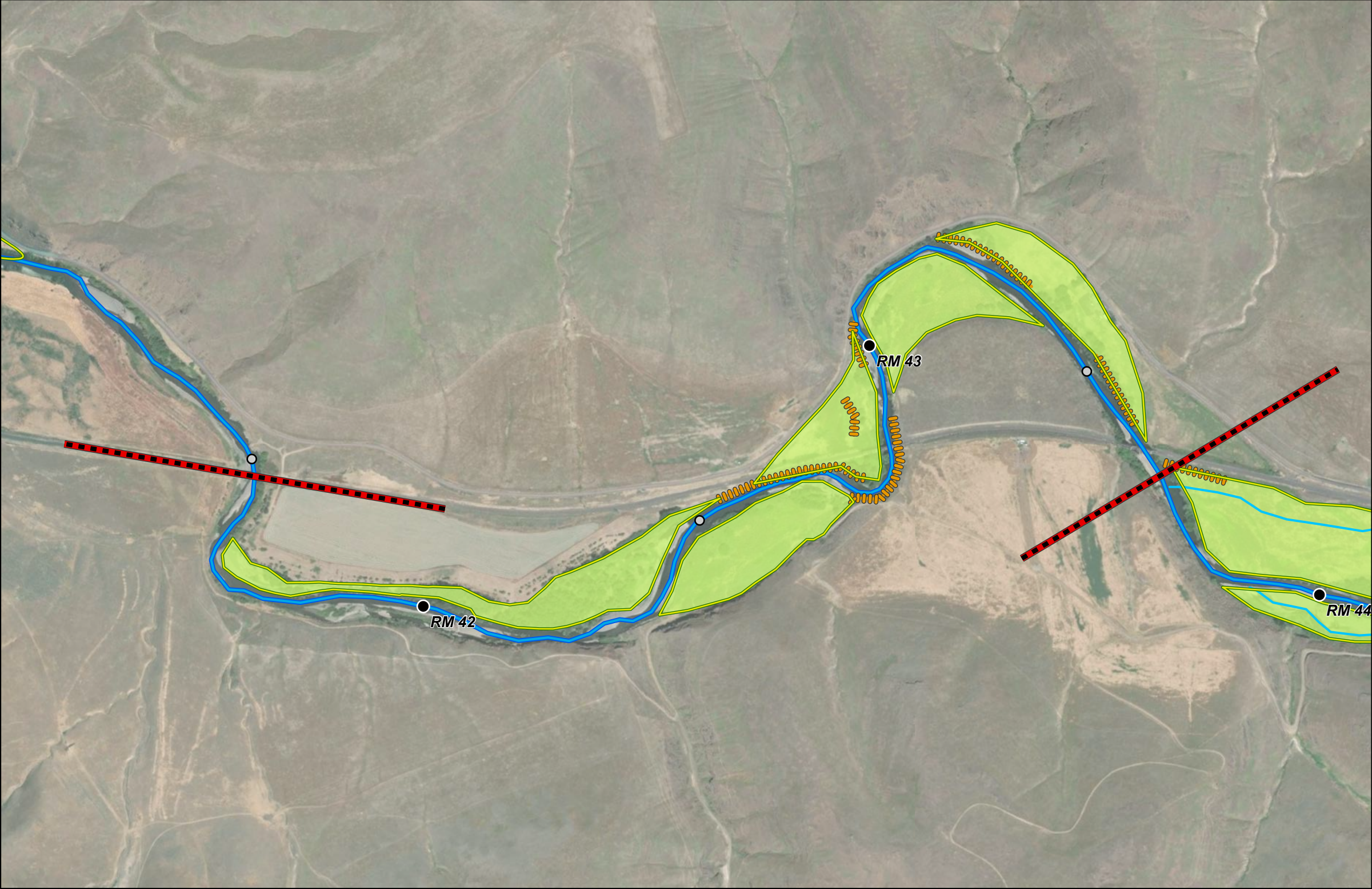
Reach Name: UM17

Prioritization Tier:

Tier 3

Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (8) Water Management-Improve Irrigation Efficiency
- (9) Acquire or Increase Instream Flow (Lease/Purchase; GW Storage)
- (18) Restore Banklines with LWD - Bioengineering
- (24) Restoration of Floodplain Topography and Vegetation



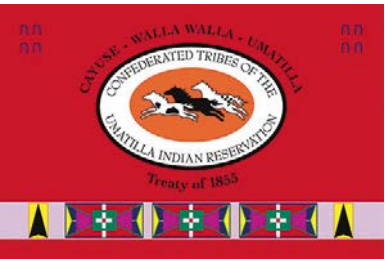
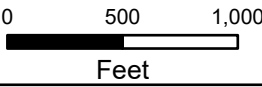
Legend

- River Miles (1.0)
  - River Miles (0.5)
  - 2020 Centerline
  - ▬ Reach Boundary
  - Improve Thermal Refugia
  - Dam Removal
- Restore Banklines with LWD
  - LWD Placements
  - Side Channel
  - Hyporheic Off-Channel Habitat
  - Riparian Fencing
  - Bank Shaping and Stabilization
  - Removal of Bank Armoring
  - Levee Modification
- Protection
  - Channel Reconstruction
  - Floodplain Pond
  - Remove and/or Relocate Floodplain Infrastructure
  - Wetland Restoration\*
  - Riparian Buffer Planting
  - Restore Floodplain Topography and Vegetation
  - Upland Vegetation Treatment
  - Floodplain Excavation
  - Alcove

\*based on NWI Existing Wetlands (2023)

Umatilla River Assessment  
Reach-by-Reach Map Book

Reach UM17  
Restoration Actions





Reach Opportunities

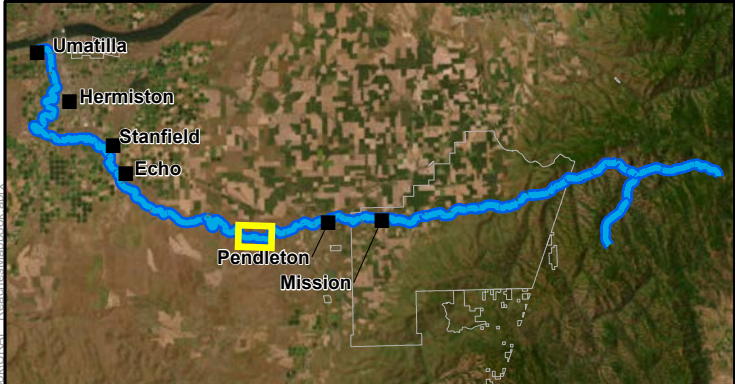
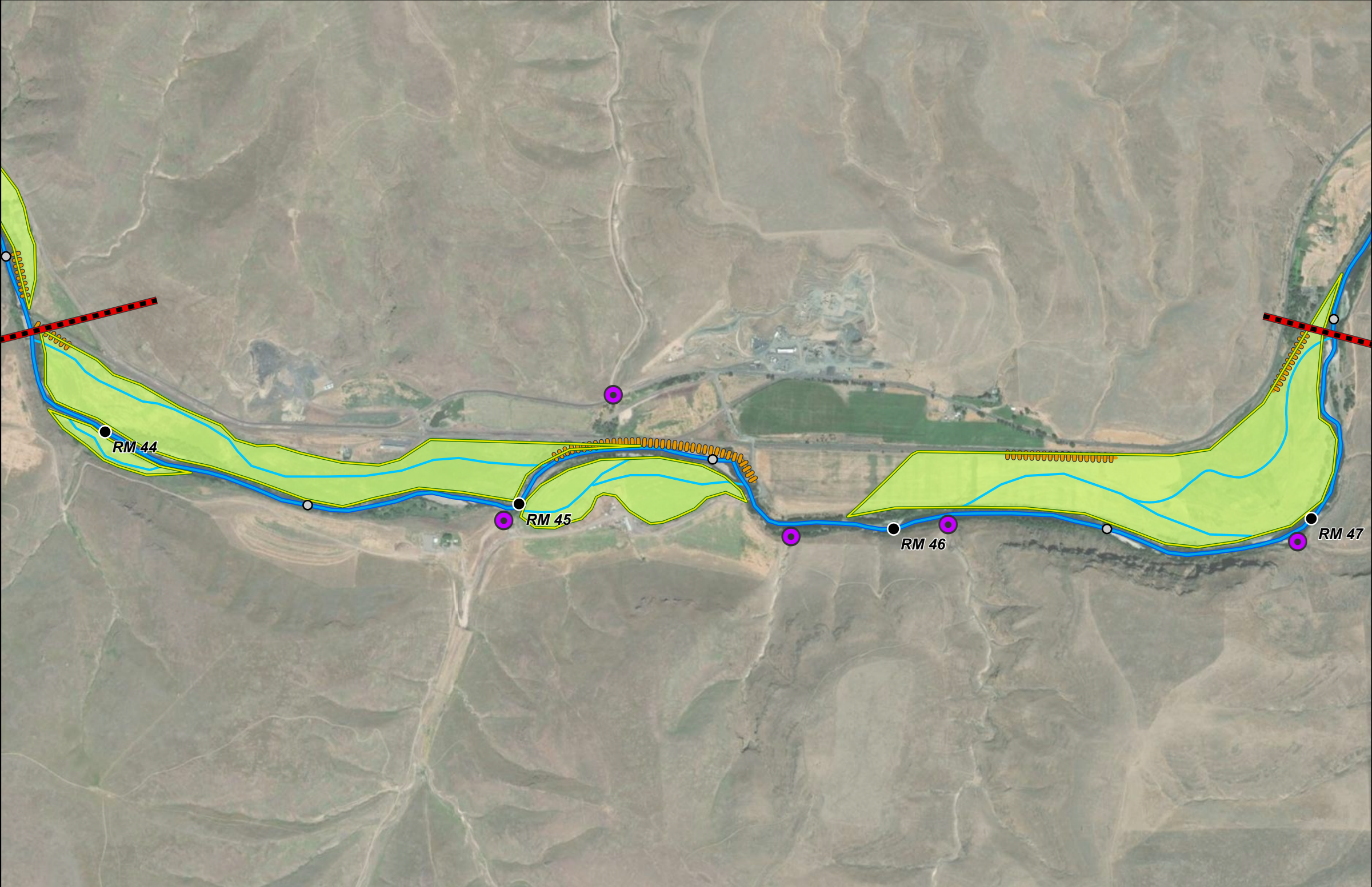
Reach Name: UM18

Prioritization Tier:

Tier 2

Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (8) Water Management-Improve Irrigation Efficiency
- (9) Acquire or Increase Instream Flow (Lease/Purchase; GW Storage)
- (14) Beaver Re-introduction or Management
- (18) Restore Banklines with LWD - Bioengineering
- (24) Restoration of Floodplain Topography and Vegetation
- (26) Improve Thermal Refugia (reconnect cold springs, winter temps)
- (28) Secondary Channel (non-perennial)



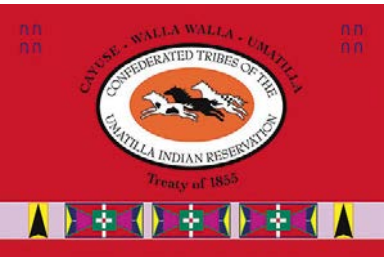
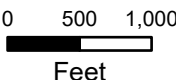
Legend

- River Miles (1.0)
  - River Miles (0.5)
  - 2020 Centerline
  - Reach Boundary
  - Improve Thermal Refugia
  - Dam Removal
- Restore Banklines with LWD
  - LWD Placements
  - Side Channel
  - Hyporheic Off-Channel Habitat
  - Riparian Fencing
  - Bank Shaping and Stabilization
  - Removal of Bank Armoring
  - Levee Modification
- Protection
  - Channel Reconstruction
  - Floodplain Pond
  - Remove and/or Relocate Floodplain Infrastructure
  - Wetland Restoration\*
  - Riparian Buffer Planting
  - Restore Floodplain Topography and Vegetation
  - Upland Vegetation Treatment
  - Floodplain Excavation
  - Alcove

\*based on NWI Existing Wetlands (2023)

Umatilla River Assessment  
Reach-by-Reach Map Book

Reach UM18  
Restoration Actions





Reach Opportunities

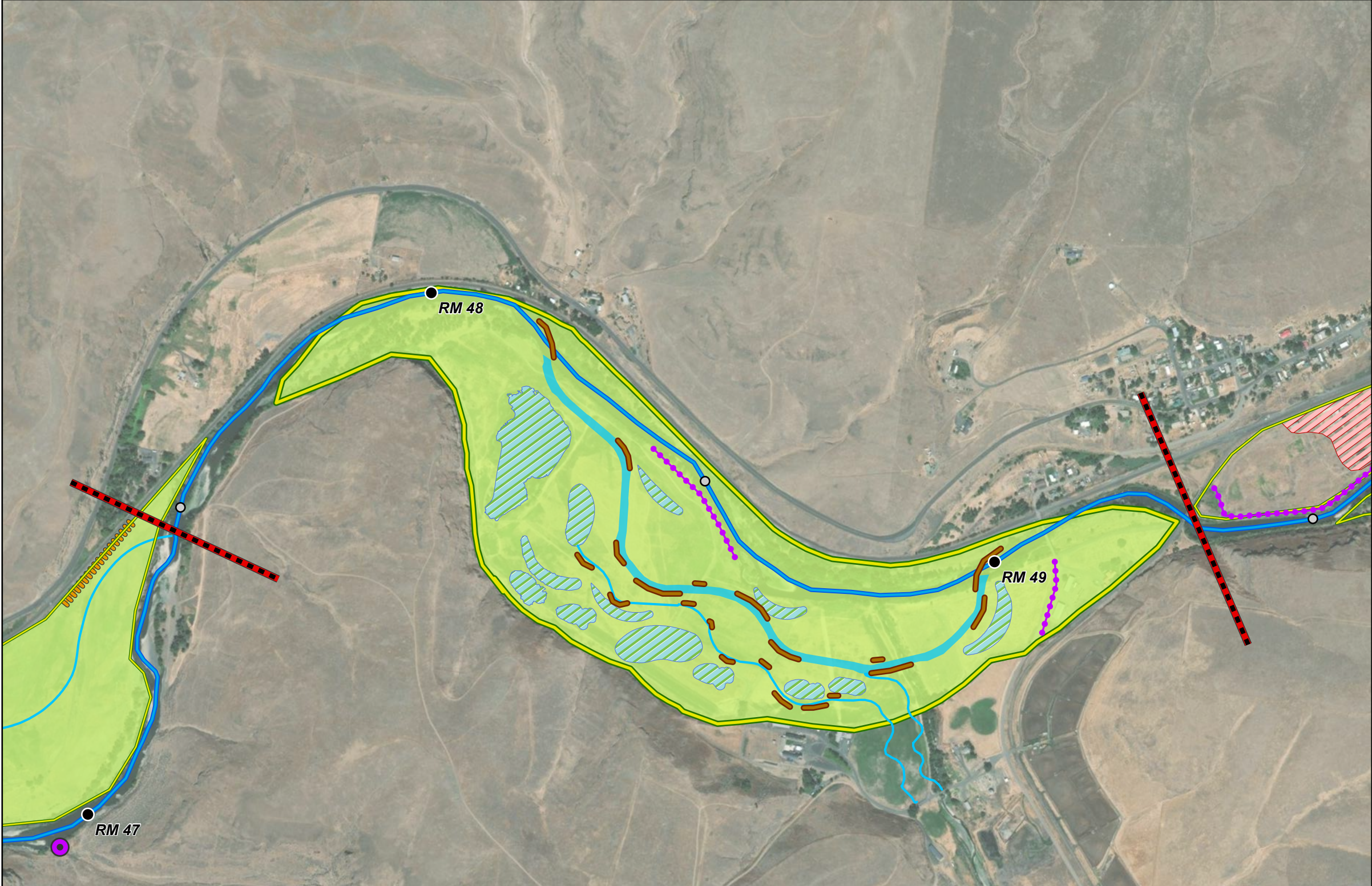
Reach Name: UM19

Prioritization Tier:

Tier 2

Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (8) Water Management-Improve Irrigation Efficiency
- (9) Acquire or Increase Instream Flow (Lease/Purchase; GW Storage)
- (17) Removal of Bank Armoring
- (20) LWD Placements - Individual Whole Trees, Logjams, etc.
- (22) Levee Modifications: Removal, Setback, Breach
- (24) Restoration of Floodplain Topography and Vegetation
- (26) Improve Thermal Refugia (reconnect cold springs, winter temps)
- (27) Perennial Side Channel
- (30) Wetland
- (37) Channel Reconstruction



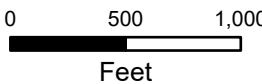
Legend

- River Miles (1.0)
  - River Miles (0.5)
  - 2020 Centerline
  - Reach Boundary
  - Improve Thermal Refugia
  - Dam Removal
- Restore Banklines with LWD
  - LWD Placements
  - Side Channel
  - Hyporheic Off-Channel Habitat
  - Riparian Fencing
  - Bank Shaping and Stabilization
  - Removal of Bank Armoring
  - Levee Modification
- Protection
  - Channel Reconstruction
  - Floodplain Pond
  - Remove and/or Relocate Floodplain Infrastructure
  - Wetland Restoration\*
  - Riparian Buffer Planting
  - Restore Floodplain Topography and Vegetation
  - Upland Vegetation Treatment
  - Floodplain Excavation
  - Alcove

\*based on NWI Existing Wetlands (2023)

Umatilla River Assessment  
Reach-by-Reach Map Book

Reach UM19  
Restoration Actions





Reach Opportunities

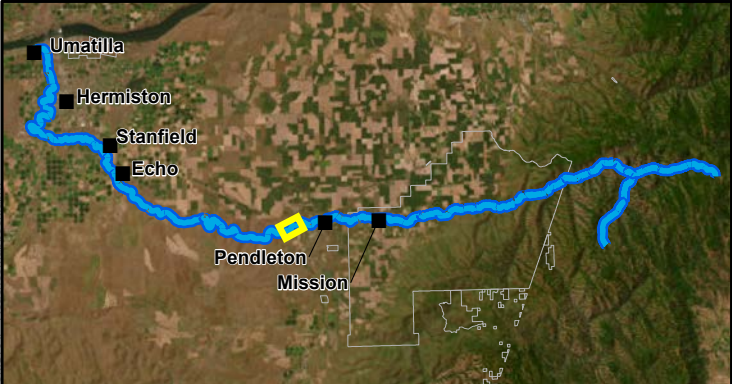
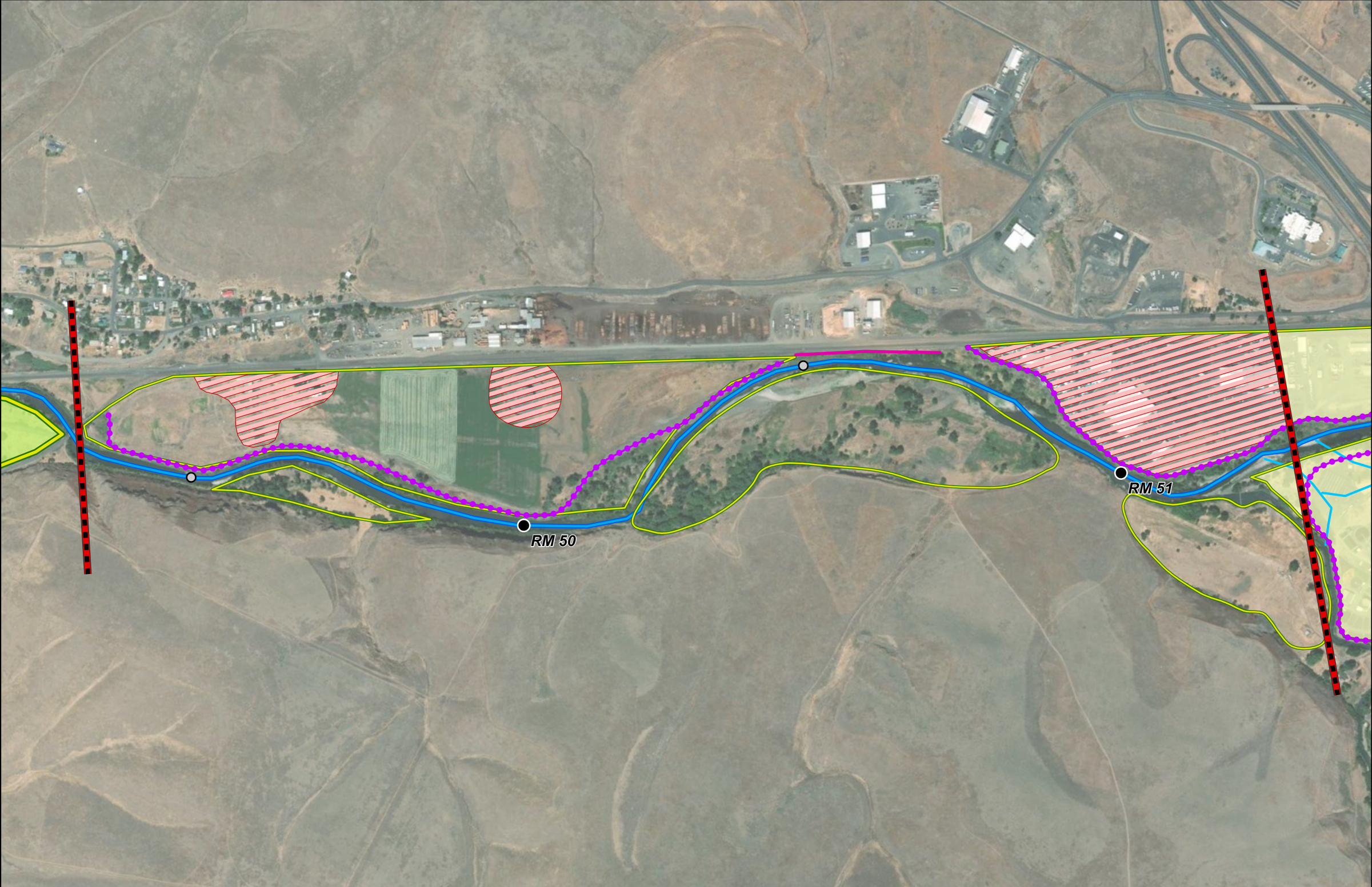
Reach Name: UM20

Prioritization Tier:

Tier 1

Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (16) Bank Shaping and Stabilization
- (17) Removal of Bank Armoring
- (22) Levee Modifications: Removal, Setback, Breach
- (23) Remove and/or Relocate Floodplain Infrastructure



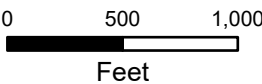
Legend

- River Miles (1.0)
  - River Miles (0.5)
  - 2020 Centerline
  - Reach Boundary
  - Improve Thermal Refugia
  - Dam Removal
- Restore Banklines with LWD
  - LWD Placements
  - Side Channel
  - Hyporheic Off-Channel Habitat
  - Riparian Fencing
  - Bank Shaping and Stabilization
  - Removal of Bank Armoring
  - Levee Modification
- Protection
  - Channel Reconstruction
  - Floodplain Pond
  - Remove and/or Relocate Floodplain Infrastructure
  - Wetland Restoration\*
  - Riparian Buffer Planting
  - Restore Floodplain Topography and Vegetation
  - Upland Vegetation Treatment
  - Floodplain Excavation
  - Alcove

\*based on NWI Existing Wetlands (2023)

Umatilla River Assessment  
Reach-by-Reach Map Book

Reach UM20  
Restoration Actions





# Reach Opportunities

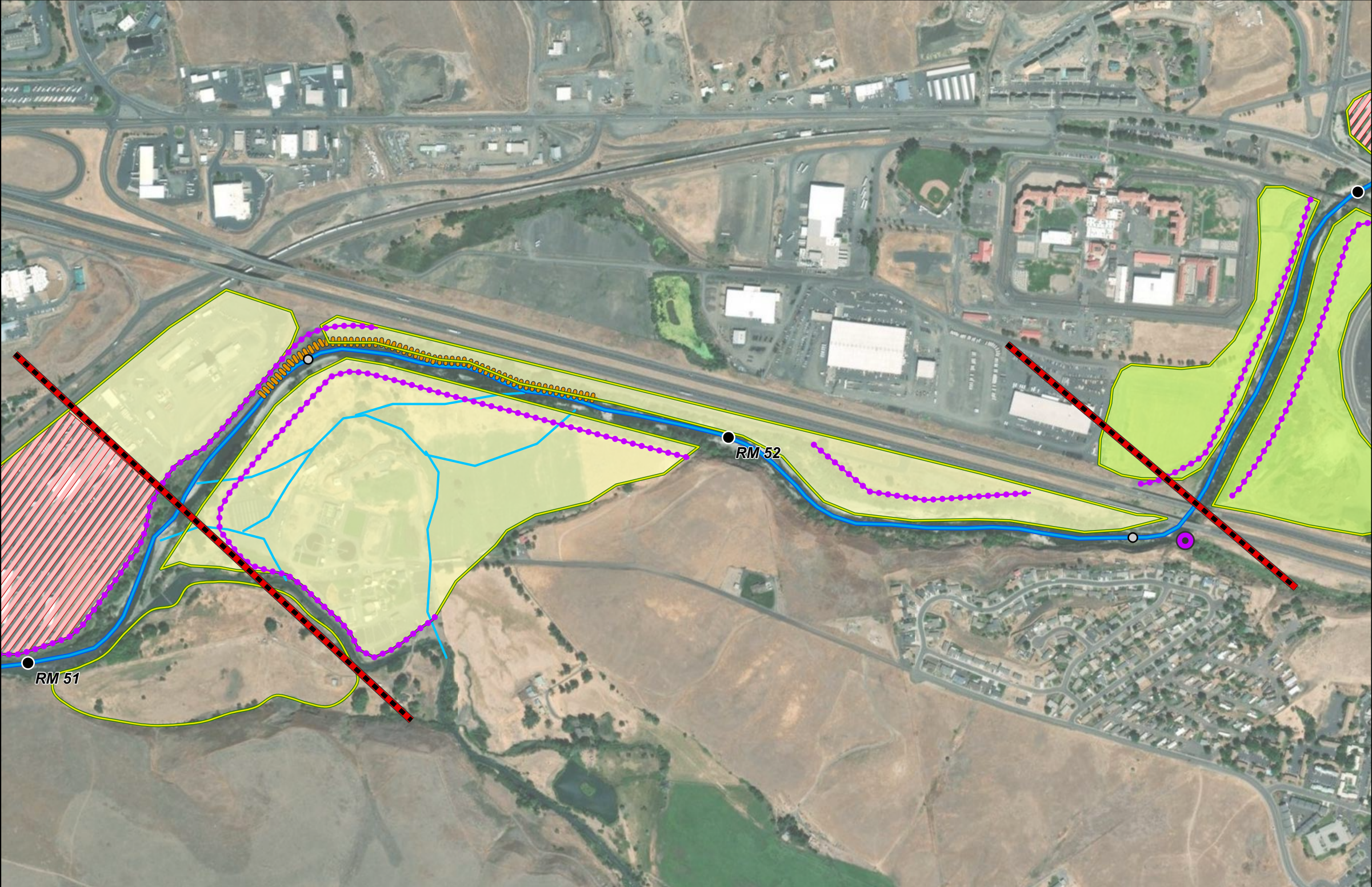
Reach Name: UM21

Prioritization Tier:

Tier 1

## Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (17) Removal of Bank Armoring
- (18) Restore Banklines with LWD - Bioengineering
- (22) Levee Modifications: Removal, Setback, Breach
- (25) Floodplain Excavation: Benching
- (27) Perennial Side Channel
- (28) Secondary Channel (non-perennial)



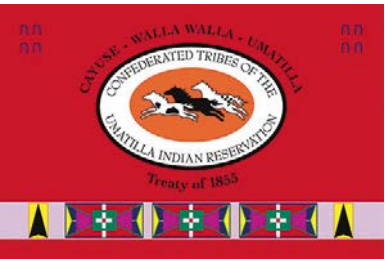
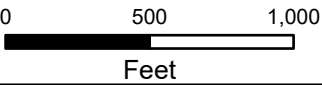
## Legend

- River Miles (1.0)
- River Miles (0.5)
- 2020 Centerline
- Reach Boundary
- Improve Thermal Refugia
- Dam Removal
- Restore Banklines with LWD
- LWD Placements
- Side Channel
- Hyporheic Off-Channel Habitat
- Riparian Fencing
- Bank Shaping and Stabilization
- Removal of Bank Armoring
- Levee Modification
- Protection
- Channel Reconstruction
- Floodplain Pond
- Remove and/or Relocate Floodplain Infrastructure
- Wetland Restoration\*
- Riparian Buffer Planting
- Restore Floodplain Topography and Vegetation
- Upland Vegetation Treatment
- Floodplain Excavation
- Alcove

\*based on NWI Existing Wetlands (2023)

## Umatilla River Assessment Reach-by-Reach Map Book

Reach UM21  
Restoration Actions





Reach Opportunities

Reach Name: UM22

Prioritization Tier:

Tier 1

Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (22) Levee Modifications: Removal, Setback, Breach
- (23) Remove and/or Relocate Floodplain Infrastructure
- (24) Restoration of Floodplain Topography and Vegetation
- (26) Improve Thermal Refugia (reconnect cold springs, winter temps)



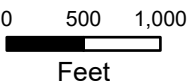
Legend

- River Miles (1.0)
  - River Miles (0.5)
  - 2020 Centerline
  - ▬ Reach Boundary
  - Improve Thermal Refugia
  - Dam Removal
- Restore Banklines with LWD
  - LWD Placements
  - Side Channel
  - Hyporheic Off-Channel Habitat
  - Riparian Fencing
  - Bank Shaping and Stabilization
  - Removal of Bank Armoring
  - Levee Modification
- Protection
  - Channel Reconstruction
  - Floodplain Pond
  - Remove and/or Relocate Floodplain Infrastructure
  - Wetland Restoration\*
  - Riparian Buffer Planting
  - Restore Floodplain Topography and Vegetation
  - Upland Vegetation Treatment
  - Floodplain Excavation
  - Alcove

\*based on NWI Existing Wetlands (2023)

Umatilla River Assessment  
Reach-by-Reach Map Book

Reach UM22  
Restoration Actions





## Reach Opportunities

**Reach Name:** UM23

<b>Prioritization Tier:</b> <b>Tier 2</b>
--

#### Restoration Actions:

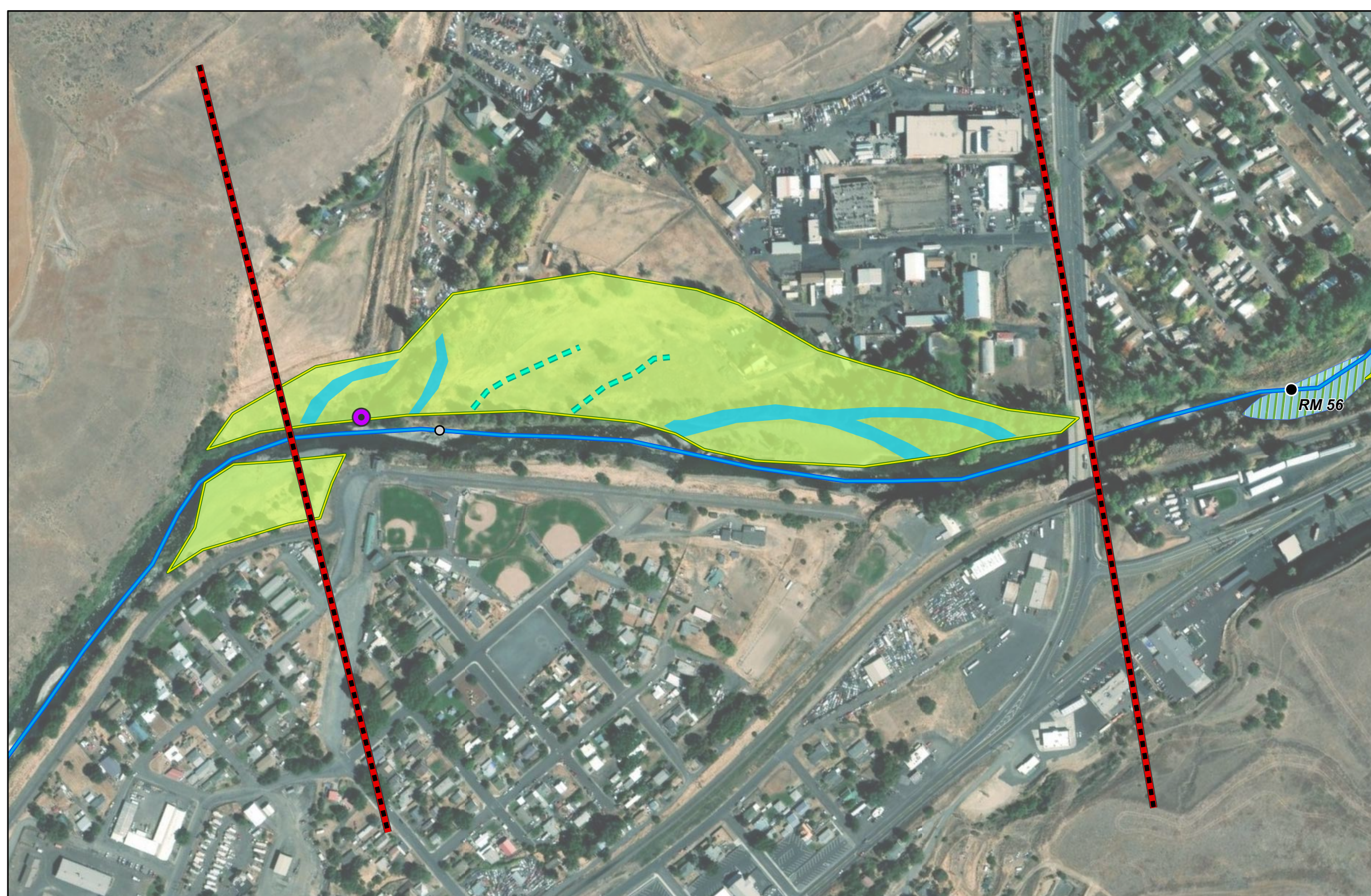
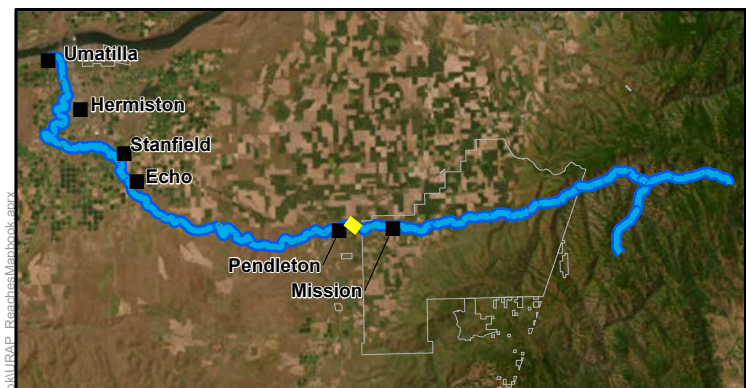
(1) Protection: (Acquisitions, Easements, Coop. Agreements)

(2) Land Management: (Grazing Plans, Fire management, etc.)

#### (24) Restoration of Floodplain Topography and Vegetation

(32) Hyporheic Off-Channel Habitat  
(Groundwater)


(37) Channel Reconstruction



## Legend

● River Miles (1.0)	Restore Banklines with LWD	Protection
○ River Miles (0.5)	LWD Placements	Channel Reconstruction
— 2020 Centerline	Side Channel	Floodplain Pond
Reach Boundary	Hyporheic Off-Channel Habitat	Remove and/or Relocate Floodplain Infrastructure
Improve Thermal Refugia	Riparian Fencing	Wetland Restoration*
Dam Removal	Bank Shaping and Stabilization	Riparian Buffer Planting
	Removal of Bank Armoring	Restore Floodplain Topography and Vegetation
	Levee Modification	Upland Vegetation Treatment
		Floodplain Excavation
		Alcove

*\*based on NWI Existing Wetlands (2023)*

-  Dam Removal

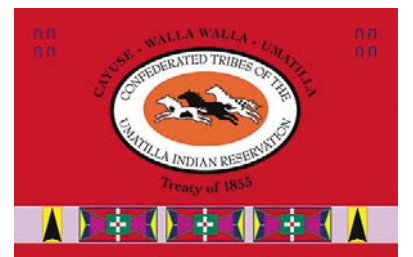
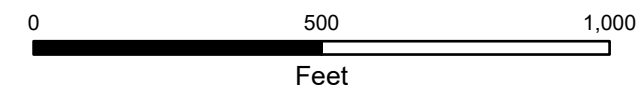
-  Levee Modification

-  Floodplain Excavation

- \*based on NWI Existing Wetlands (2023)*

# Umatilla River Assessment Reach-by-Reach Map Book

## Reach UM23 Restoration Actions





# Reach Opportunities

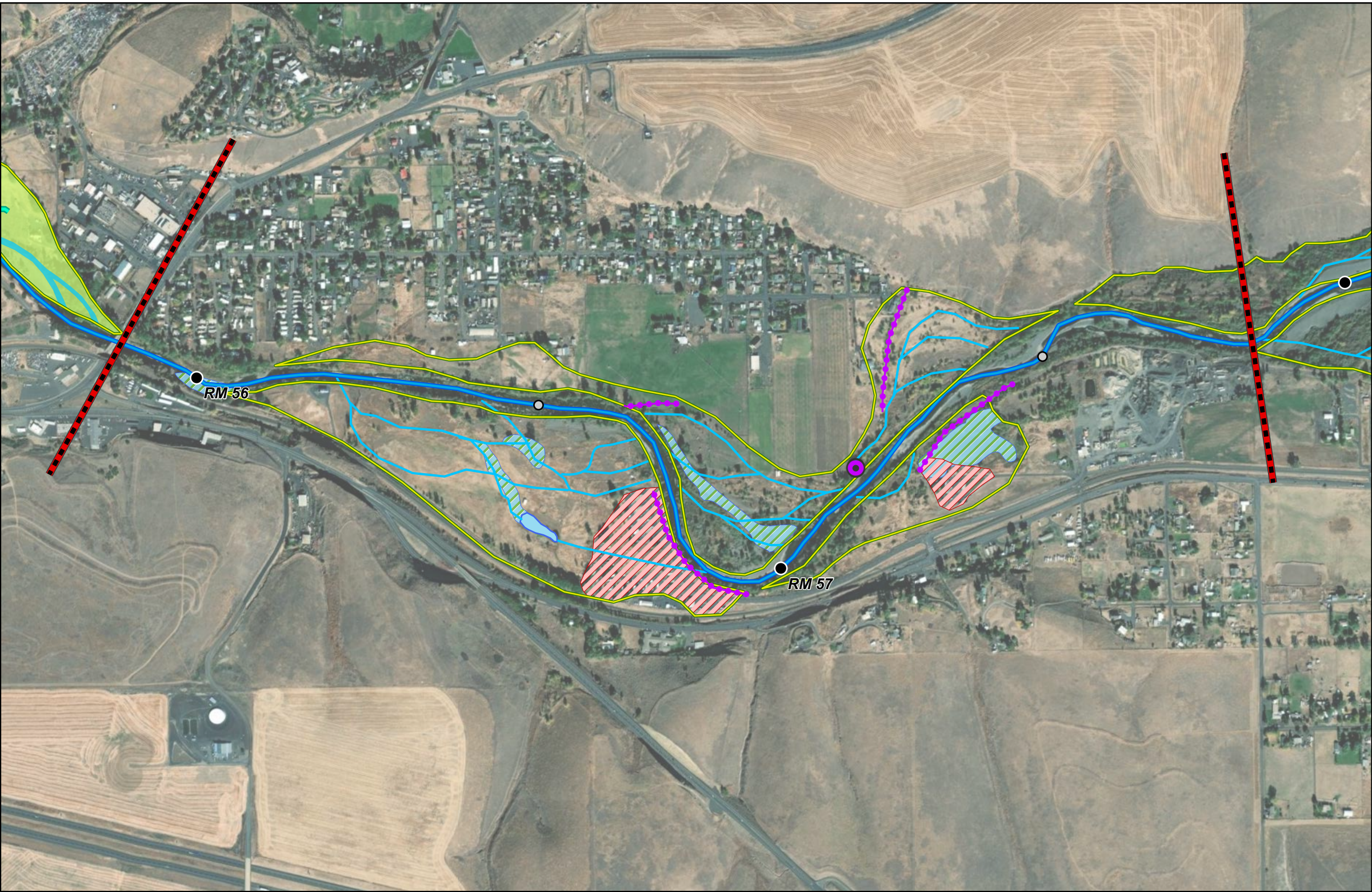
Reach Name: UM24

Prioritization Tier:

Tier 1

## Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (14) Beaver Re-introduction or Management
- (22) Levee Modifications: Removal, Setback, Breach
- (23) Remove and/or Relocate Floodplain Infrastructure
- (26) Improve Thermal Refugia (reconnect cold springs, winter temps)
- (27) Perennial Side Channel
- (29) Floodplain Pond
- (30) Wetland



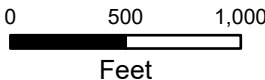
## Legend

- River Miles (1.0)
- River Miles (0.5)
- 2020 Centerline
- Reach Boundary
- Improve Thermal Refugia
- Dam Removal
- Restore Banklines with LWD
- LWD Placements
- Side Channel
- Hyporheic Off-Channel Habitat
- Riparian Fencing
- Bank Shaping and Stabilization
- Removal of Bank Armoring
- Levee Modification
- Protection
- Channel Reconstruction
- Floodplain Pond
- Remove and/or Relocate Floodplain Infrastructure
- Wetland Restoration\*
- Riparian Buffer Planting
- Restore Floodplain Topography and Vegetation
- Upland Vegetation Treatment
- Floodplain Excavation
- Alcove

\*based on NWI Existing Wetlands (2023)

## Umatilla River Assessment Reach-by-Reach Map Book

Reach UM24  
Restoration Actions





Reach Opportunities

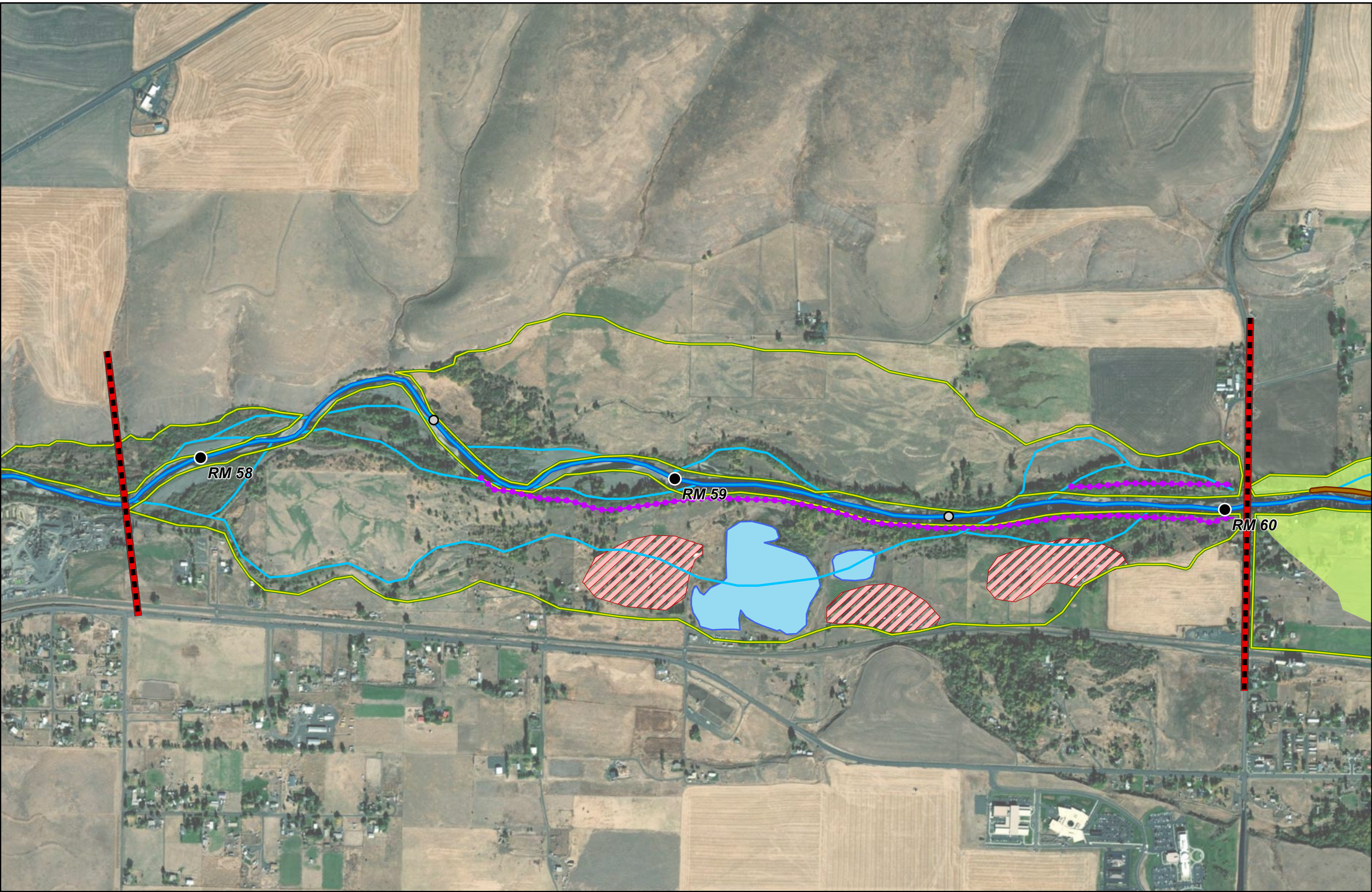
Reach Name: UM25

Prioritization Tier:

Tier 1

Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (22) Levee Modifications: Removal, Setback, Breach
- (23) Remove and/or Relocate Floodplain Infrastructure
- (27) Perennial Side Channel
- (28) Secondary Channel (non-perennial)
- (29) Floodplain Pond
- (38) Structural Passage (Diversions, Screening)



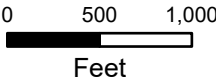
Legend

- |                           |                                |  |
|---------------------------|--------------------------------|--|
| ● River Miles (1.0)       | Restore Banklines with LWD     | Protection                                       |
| ○ River Miles (0.5)       | LWD Placements                 | Channel Reconstruction                           |
| — 2020 Centerline         | Side Channel                   | Floodplain Pond                                  |
| — Reach Boundary          | Hyporheic Off-Channel Habitat  | Remove and/or Relocate Floodplain Infrastructure |
| ● Improve Thermal Refugia | Riparian Fencing               | Wetland Restoration*                             |
| ○ Dam Removal             | Bank Shaping and Stabilization | Riparian Buffer Planting                         |
|                           | Removal of Bank Armoring       | Restore Floodplain Topography and Vegetation     |
|                           | Levee Modification             | Upland Vegetation Treatment                      |
|                           |                                | Floodplain Excavation                            |
|                           |                                | Alcove   |

\*based on NWI Existing Wetlands (2023)

Umatilla River Assessment  
Reach-by-Reach Map Book

Reach UM25  
Restoration Actions





Reach Opportunities

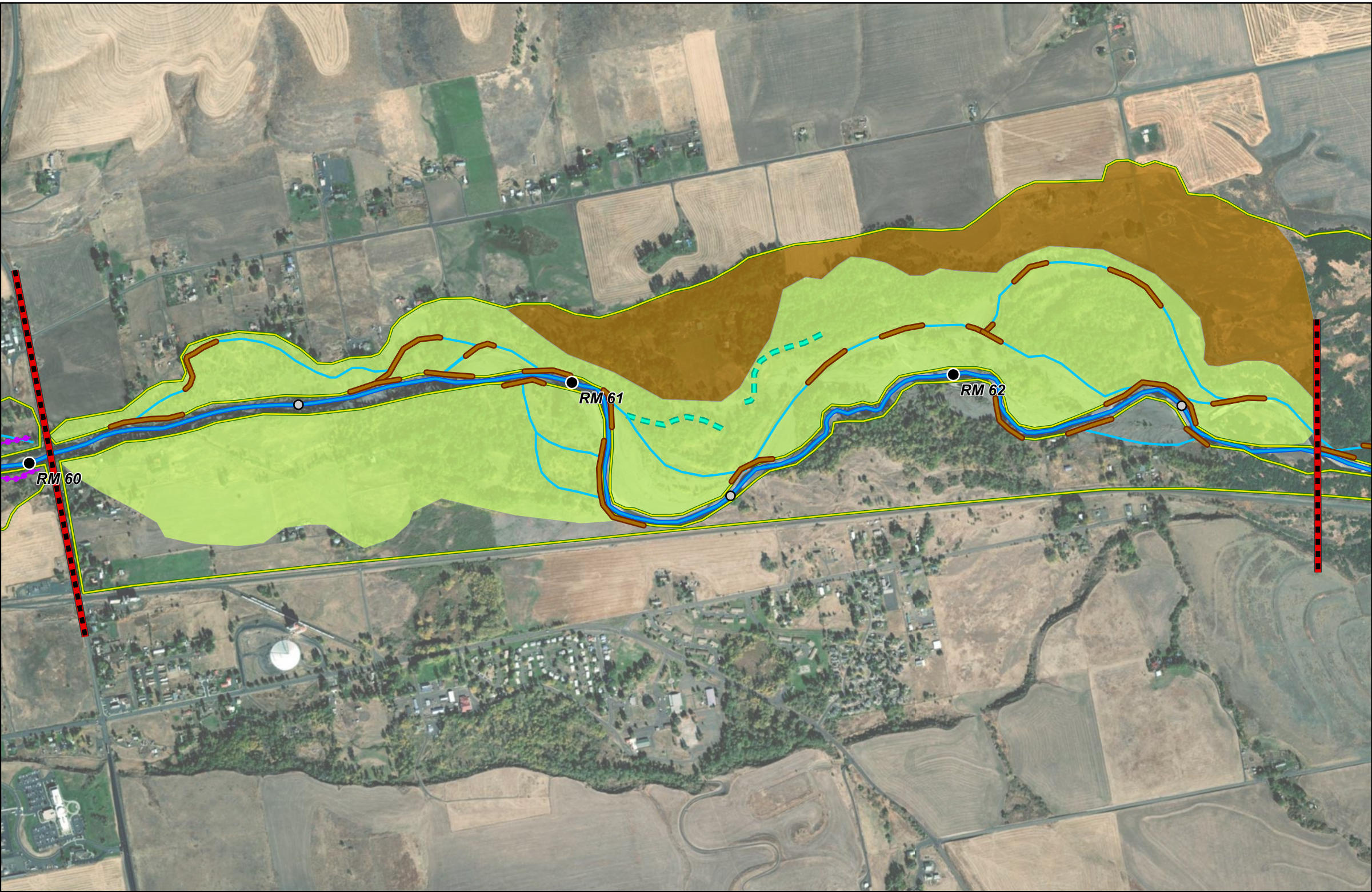
Reach Name: UM26

Prioritization Tier:

Tier 1

Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (5) Upland Vegetation Treatment - Management
- (14) Beaver Re-introduction or Management
- (20) LWD Placements - Individual Whole Trees, Logjams, etc.
- (24) Restoration of Floodplain Topography and Vegetation
- (27) Perennial Side Channel
- (32) Hyporheic Off-Channel Habitat (Groundwater)
- (36) Meander (Oxbow) Re-connect - Reconstruction



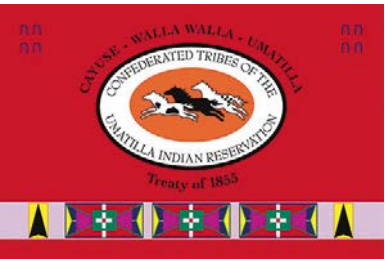
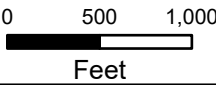
Legend

- River Miles (1.0)
- River Miles (0.5)
- 2020 Centerline
- Reach Boundary
- Improve Thermal Refugia
- Dam Removal
- Restore Banklines with LWD
- LWD Placements
- Side Channel
- Hyporheic Off-Channel Habitat
- Riparian Fencing
- Bank Shaping and Stabilization
- Removal of Bank Armoring
- Levee Modification
- Protection
- Channel Reconstruction
- Floodplain Pond
- Remove and/or Relocate Floodplain Infrastructure
- Wetland Restoration\*
- Riparian Buffer Planting
- Restore Floodplain Topography and Vegetation
- Upland Vegetation Treatment
- Floodplain Excavation
- Alcove

\*based on NWI Existing Wetlands (2023)

Umatilla River Assessment  
Reach-by-Reach Map Book

Reach UM26  
Restoration Actions





# Reach Opportunities

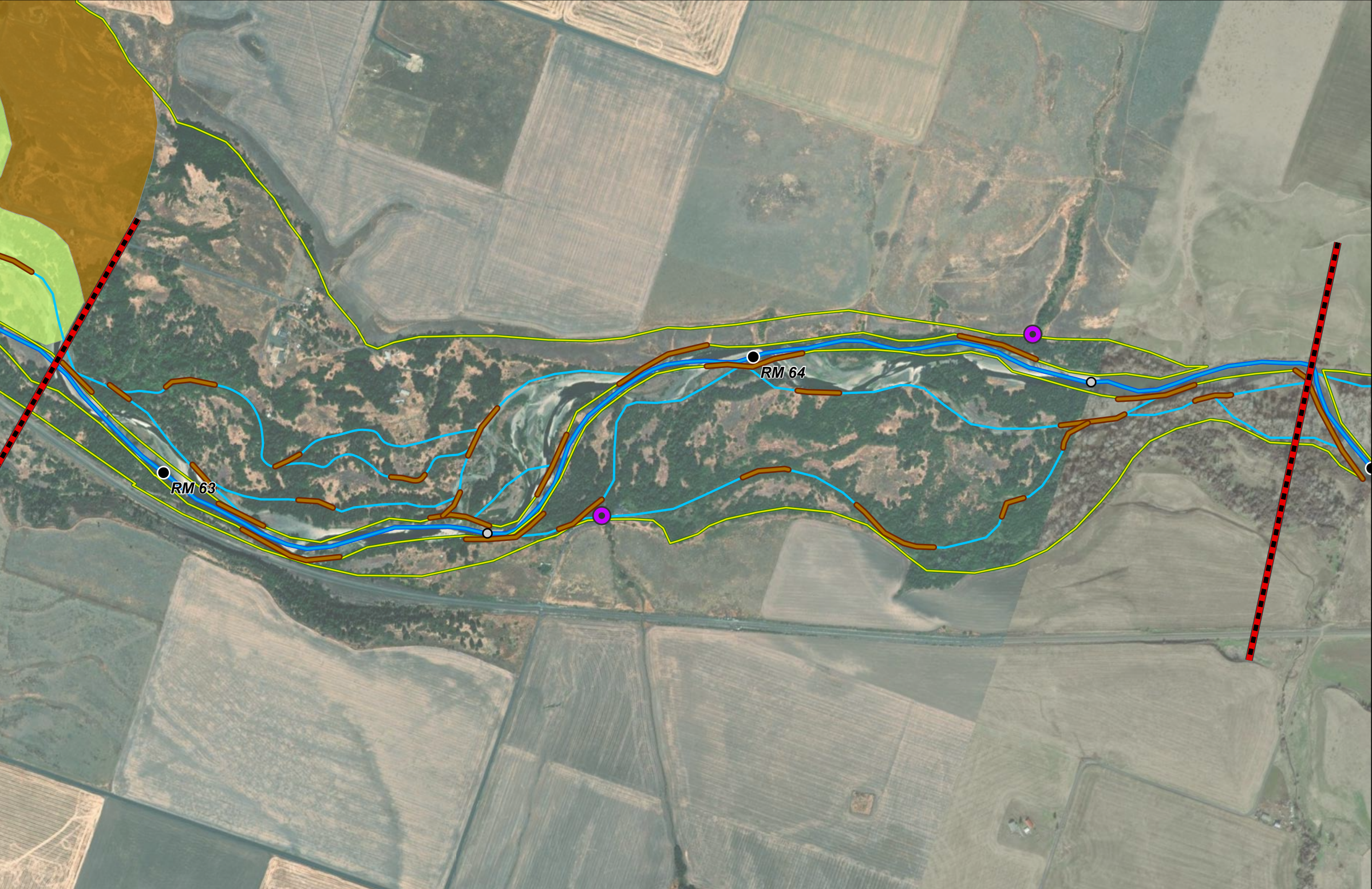
Reach Name: UM27

Prioritization Tier:

Tier 2

## Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (8) Water Management-Improve Irrigation Efficiency
- (9) Acquire or Increase Instream Flow (Lease/Purchase; GW Storage)
- (20) LWD Placements - Individual Whole Trees, Logjams, etc.
- (26) Improve Thermal Refugia (reconnect cold springs, winter temps)
- (27) Perennial Side Channel



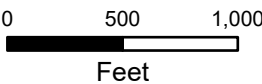
## Legend

- |                           |                                |  |
|---------------------------|--------------------------------|--|
| ● River Miles (1.0)       | Restore Banklines with LWD     | Protection                                       |
| ○ River Miles (0.5)       | LWD Placements                 | Channel Reconstruction                           |
| — 2020 Centerline         | Side Channel                   | Floodplain Pond                                  |
| — Reach Boundary          | Hyporheic Off-Channel Habitat  | Remove and/or Relocate Floodplain Infrastructure |
| ● Improve Thermal Refugia | Riparian Fencing               | Wetland Restoration*                             |
| ○ Dam Removal             | Bank Shaping and Stabilization | Riparian Buffer Planting                         |
|                           | Removal of Bank Armoring       | Restore Floodplain Topography and Vegetation     |
|                           | Levee Modification             | Upland Vegetation Treatment                      |
|                           |                                | Floodplain Excavation                            |
|                           |                                | Alcove   |

\*based on NWI Existing Wetlands (2023)

## Umatilla River Assessment Reach-by-Reach Map Book

Reach UM27  
Restoration Actions





Reach Opportunities

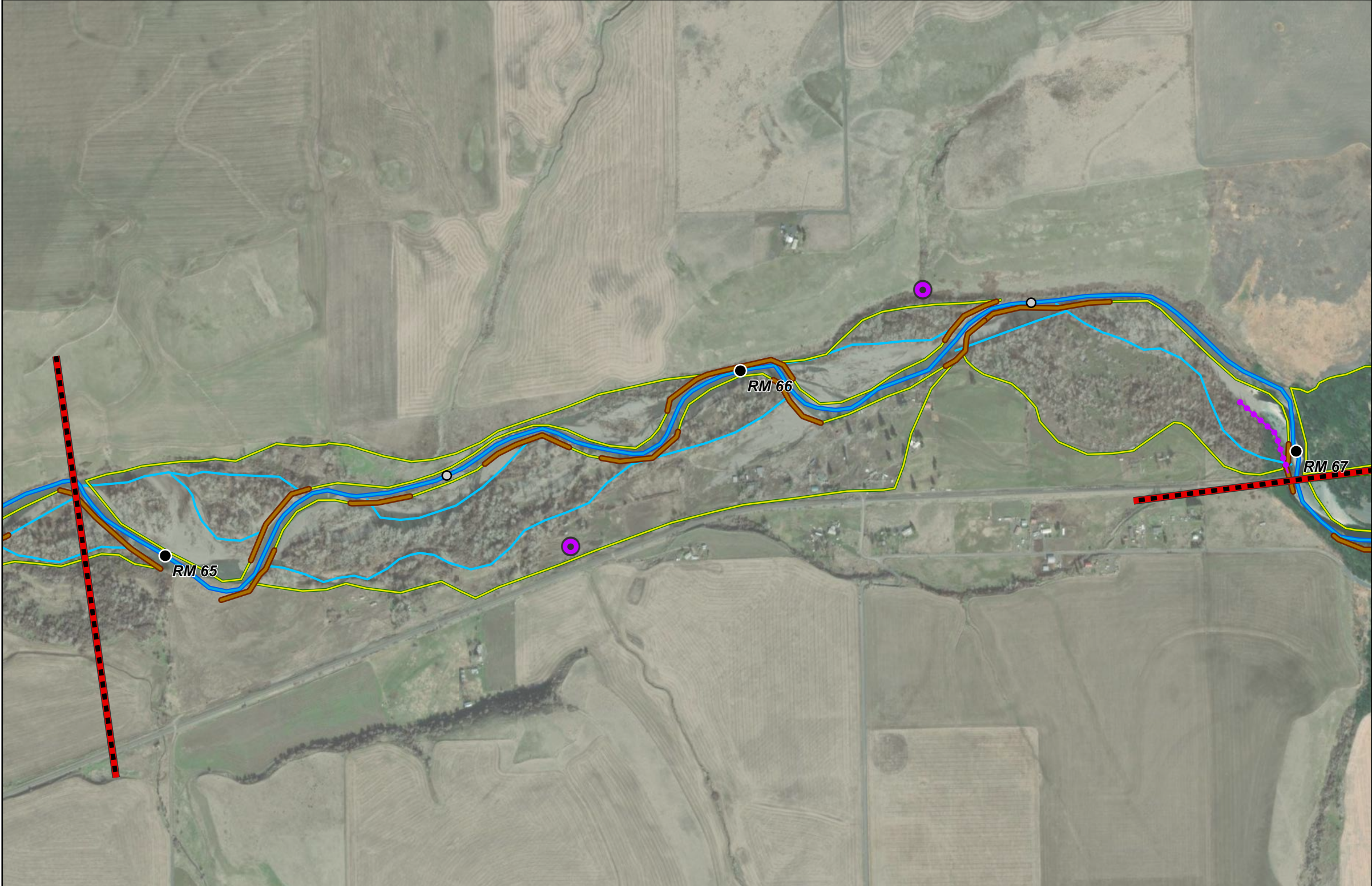
Reach Name: UM28

Prioritization Tier:

Tier 1

Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (8) Water Management-Improve Irrigation Efficiency
- (9) Acquire or Increase Instream Flow (Lease/Purchase; GW Storage)
- (20) LWD Placements - Individual Whole Trees, Logjams, etc.
- (22) Levee Modifications: Removal, Setback, Breach
- (26) Improve Thermal Refugia (reconnect cold springs, winter temps)
- (27) Perennial Side Channel



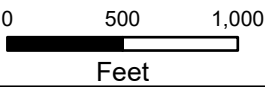
Legend

- River Miles (1.0)
  - River Miles (0.5)
  - 2020 Centerline
  - ▬ Reach Boundary
  - Improve Thermal Refugia
  - Dam Removal
- Restore Banklines with LWD
  - LWD Placements
  - Side Channel
  - Hyporheic Off-Channel Habitat
  - Riparian Fencing
  - Bank Shaping and Stabilization
  - Removal of Bank Armoring
  - Levee Modification
- Protection
  - Channel Reconstruction
  - Floodplain Pond
  - Remove and/or Relocate Floodplain Infrastructure
  - Wetland Restoration\*
  - Riparian Buffer Planting
  - Restore Floodplain Topography and Vegetation
  - Upland Vegetation Treatment
  - Floodplain Excavation
  - Alcove

\*based on NWI Existing Wetlands (2023)

Umatilla River Assessment  
Reach-by-Reach Map Book

Reach UM28  
Restoration Actions





Reach Opportunities

Reach Name: UM29

Prioritization Tier:

Tier 3

Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (11) Off-Site Water Developments
- (14) Beaver Re-introduction or Management
- (20) LWD Placements - Individual Whole Trees, Logjams, etc.



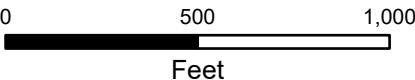
Legend

- River Miles (1.0)
  - River Miles (0.5)
  - 2020 Centerline
  - ▬ Reach Boundary
  - Improve Thermal Refugia
  - Dam Removal
- Restore Banklines with LWD
  - LWD Placements
  - Side Channel
  - Hyporheic Off-Channel Habitat
  - Riparian Fencing
  - Bank Shaping and Stabilization
  - Removal of Bank Armoring
  - Levee Modification
- Protection
  - Channel Reconstruction
  - Floodplain Pond
  - Remove and/or Relocate Floodplain Infrastructure
  - Wetland Restoration\*
  - Riparian Buffer Planting
  - Restore Floodplain Topography and Vegetation
  - Upland Vegetation Treatment
  - Floodplain Excavation
  - Alcove

\*based on NWI Existing Wetlands (2023)

Umatilla River Assessment  
Reach-by-Reach Map Book

Reach UM29  
Restoration Actions





Reach Opportunities

Reach Name: UM30

Prioritization Tier:

Tier 2

Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (20) LWD Placements - Individual Whole Trees, Logjams, etc.
- (22) Levee Modifications: Removal, Setback, Breach
- (24) Restoration of Floodplain Topography and Vegetation
- (26) Improve Thermal Refugia (reconnect cold springs, winter temps)
- (27) Perennial Side Channel
- (28) Secondary Channel (non-perennial)
- (29) Floodplain Pond



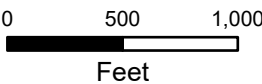
Legend

- |                           |                                |  |
|---------------------------|--------------------------------|--|
| ● River Miles (1.0)       | Restore Banklines with LWD     | Protection                                       |
| ○ River Miles (0.5)       | LWD Placements                 | Channel Reconstruction                           |
| — 2020 Centerline         | Side Channel                   | Floodplain Pond                                  |
| — Reach Boundary          | Hyporheic Off-Channel Habitat  | Remove and/or Relocate Floodplain Infrastructure |
| ● Improve Thermal Refugia | Riparian Fencing               | Wetland Restoration*                             |
| ○ Dam Removal             | Bank Shaping and Stabilization | Riparian Buffer Planting                         |
|                           | Removal of Bank Armoring       | Restore Floodplain Topography and Vegetation     |
|                           | Levee Modification             | Upland Vegetation Treatment                      |
|                           |                                | Floodplain Excavation                            |
|                           |                                | Alcove   |

\*based on NWI Existing Wetlands (2023)

Umatilla River Assessment  
Reach-by-Reach Map Book

Reach UM30  
Restoration Actions





# Reach Opportunities

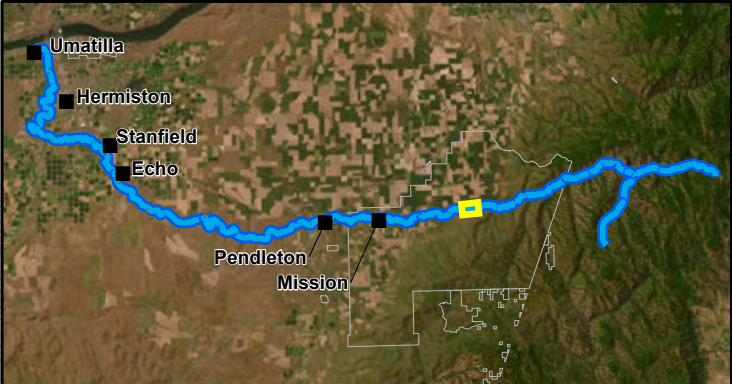
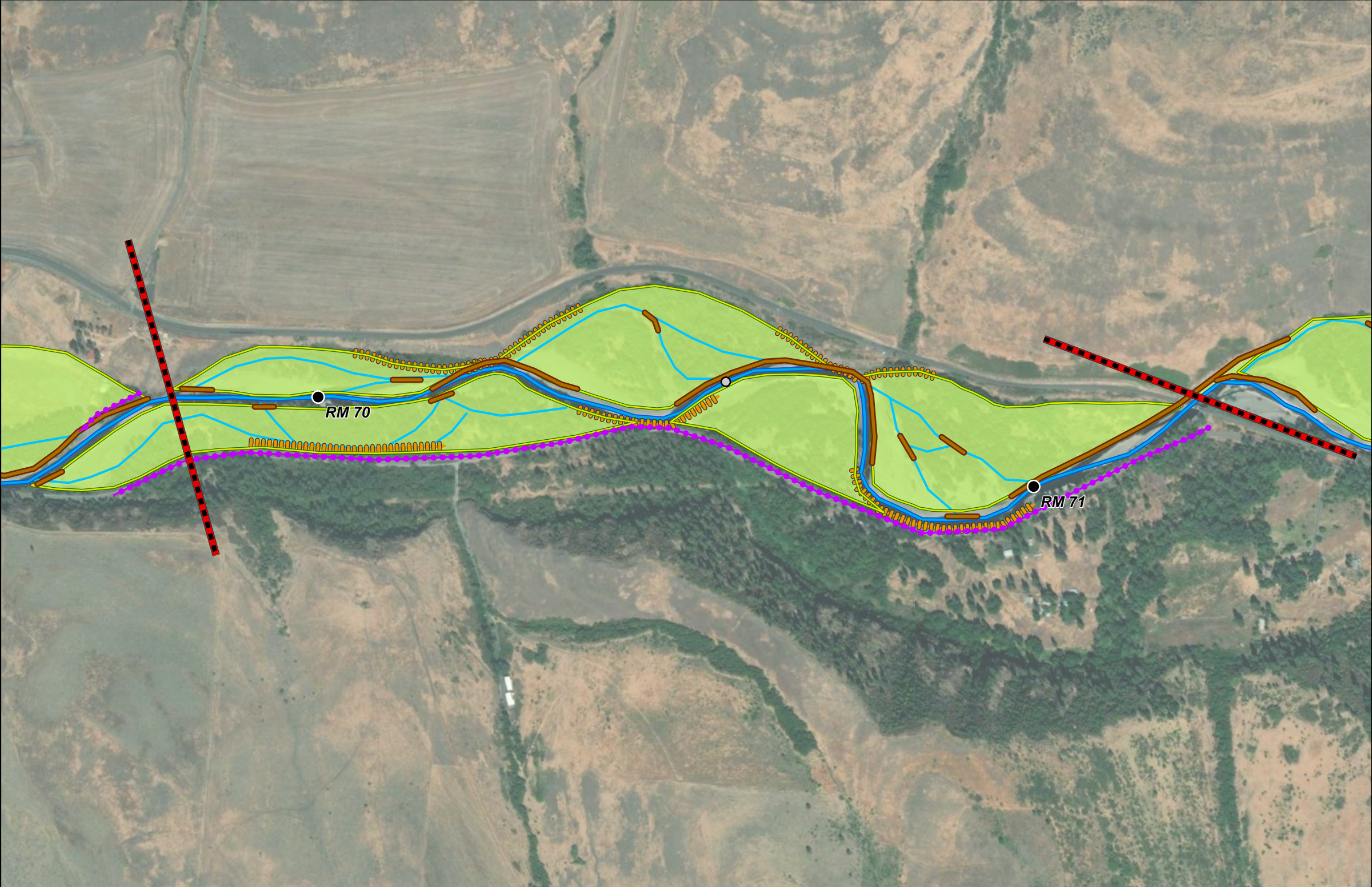
Reach Name: UM31

Prioritization Tier:

Tier 2

## Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (8) Water Management-Improve Irrigation Efficiency
- (9) Acquire or Increase Instream Flow (Lease/Purchase; GW Storage)
- (18) Restore Banklines with LWD - Bioengineering
- (20) LWD Placements - Individual Whole Trees, Logjams, etc.
- (22) Levee Modifications: Removal, Setback, Breach
- (24) Restoration of Floodplain Topography and Vegetation
- (27) Perennial Side Channel



## Legend

- River Miles (1.0)
- River Miles (0.5)
- 2020 Centerline
- Reach Boundary
- Improve Thermal Refugia
- Dam Removal
- Restore Banklines with LWD
- LWD Placements
- Side Channel
- Hyporheic Off-Channel Habitat
- Riparian Fencing
- Bank Shaping and Stabilization
- Removal of Bank Armoring
- Levee Modification
- Protection
- Channel Reconstruction
- Floodplain Pond
- Remove and/or Relocate Floodplain Infrastructure
- Wetland Restoration\*
- Riparian Buffer Planting
- Restore Floodplain Topography and Vegetation
- Upland Vegetation Treatment
- Floodplain Excavation
- Alcove

\*based on NWI Existing Wetlands (2023)

## Umatilla River Assessment Reach-by-Reach Map Book

Reach UM31  
Restoration Actions

0 500 1,000  
Feet



TETRA TECH



Reach Opportunities

Reach Name: UM32

Prioritization Tier:

Tier 3

Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (8) Water Management-Improve Irrigation Efficiency
- (9) Acquire or Increase Instream Flow (Lease/Purchase; GW Storage)
- (20) LWD Placements - Individual Whole Trees, Logjams, etc.
- (24) Restoration of Floodplain Topography and Vegetation
- (27) Perennial Side Channel
- (28) Secondary Channel (non-perennial)



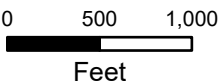
Legend

- River Miles (1.0)
  - River Miles (0.5)
  - 2020 Centerline
  - Reach Boundary
  - Improve Thermal Refugia
  - Dam Removal
- Restore Banklines with LWD
  - LWD Placements
  - Side Channel
  - Hyporheic Off-Channel Habitat
  - Riparian Fencing
  - Bank Shaping and Stabilization
  - Removal of Bank Armoring
  - Levee Modification
- Protection
  - Channel Reconstruction
  - Floodplain Pond
  - Remove and/or Relocate Floodplain Infrastructure
  - Wetland Restoration\*
  - Riparian Buffer Planting
  - Restore Floodplain Topography and Vegetation
  - Upland Vegetation Treatment
  - Floodplain Excavation
  - Alcove

\*based on NWI Existing Wetlands (2023)

Umatilla River Assessment  
Reach-by-Reach Map Book

Reach UM32  
Restoration Actions





# Reach Opportunities

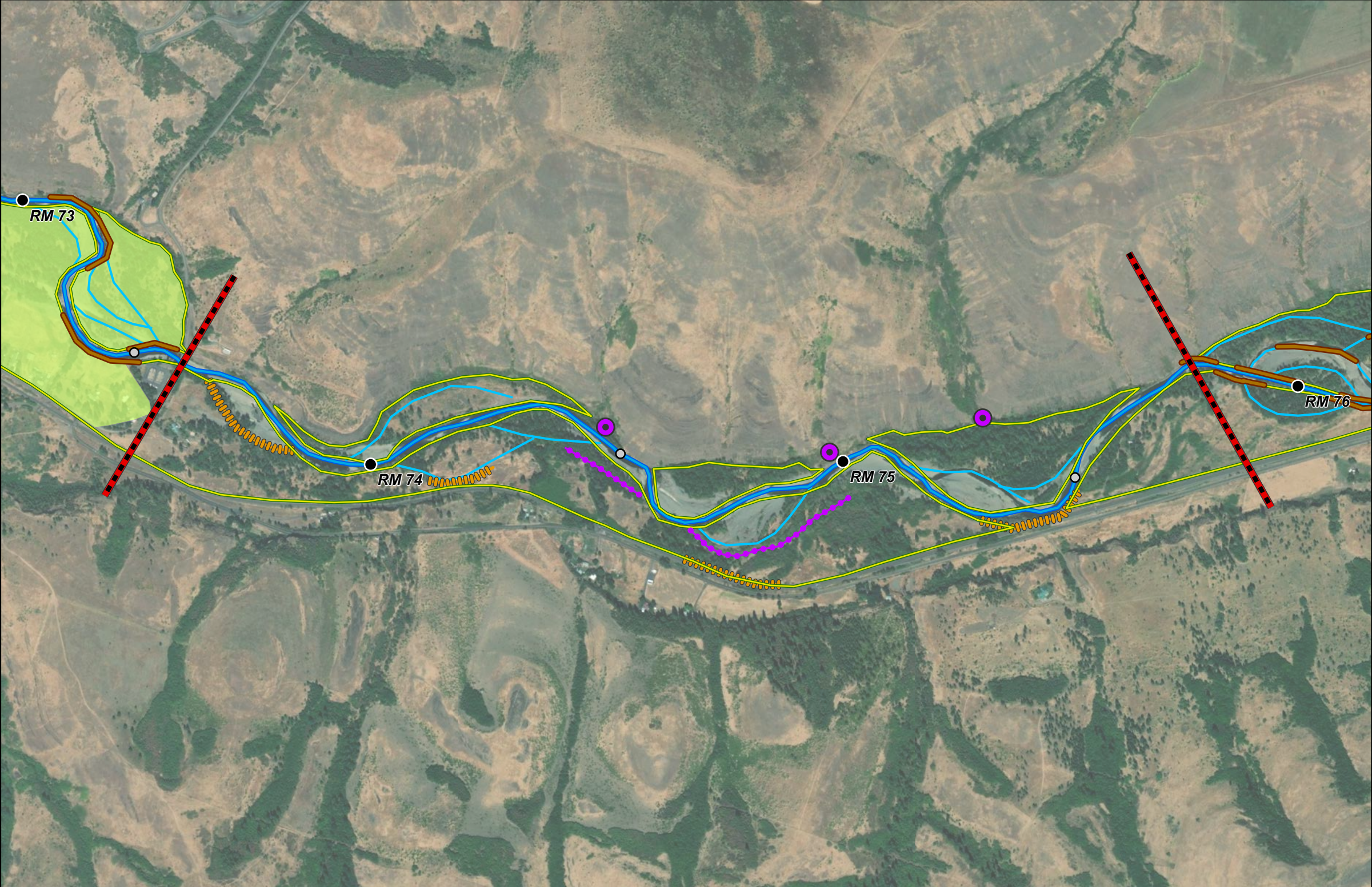
Reach Name: UM33

Prioritization Tier:

Tier 1

## Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (18) Restore Banklines with LWD - Bioengineering
- (22) Levee Modifications: Removal, Setback, Breach
- (26) Improve Thermal Refugia (reconnect cold springs, winter temps)
- (27) Perennial Side Channel



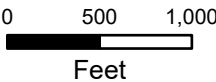
## Legend

- River Miles (1.0)
- River Miles (0.5)
- 2020 Centerline
- Reach Boundary
- Improve Thermal Refugia
- Dam Removal
- Restore Banklines with LWD
- LWD Placements
- Side Channel
- Hyporheic Off-Channel Habitat
- Riparian Fencing
- Bank Shaping and Stabilization
- Removal of Bank Armoring
- Levee Modification
- Protection
- Channel Reconstruction
- Floodplain Pond
- Remove and/or Relocate Floodplain Infrastructure
- Wetland Restoration\*
- Riparian Buffer Planting
- Restore Floodplain Topography and Vegetation
- Upland Vegetation Treatment
- Floodplain Excavation
- Alcove

\*based on NWI Existing Wetlands (2023)

## Umatilla River Assessment Reach-by-Reach Map Book

Reach UM33  
Restoration Actions





Reach Opportunities

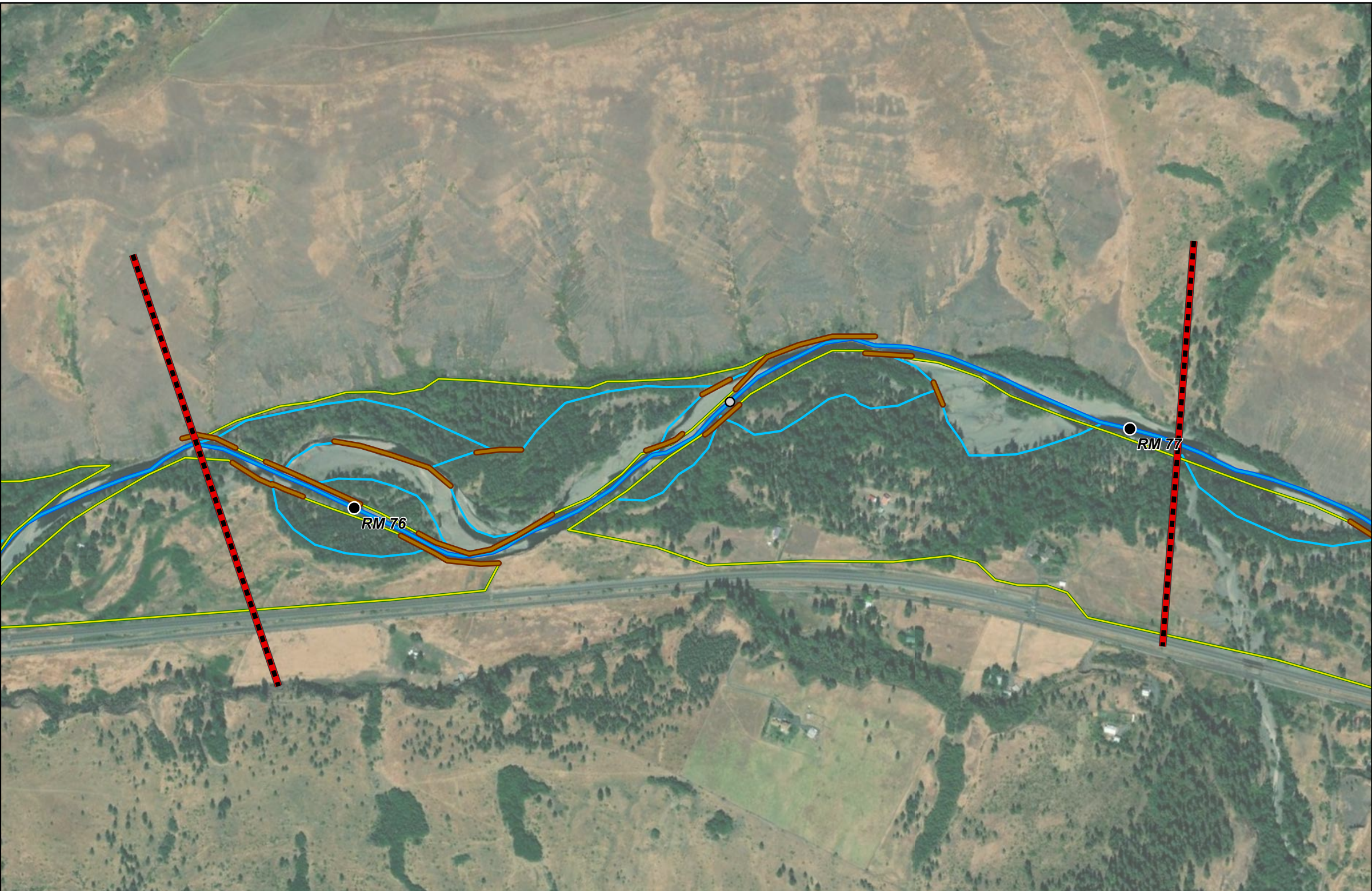
Reach Name: UM34

Prioritization Tier:

Tier 3

Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (8) Water Management-Improve Irrigation Efficiency
- (9) Acquire or Increase Instream Flow (Lease/Purchase; GW Storage)
- (20) LWD Placements - Individual Whole Trees, Logjams, etc.
- (24) Restoration of Floodplain Topography and Vegetation
- (27) Perennial Side Channel



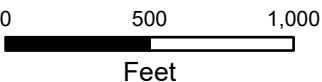
Legend

- River Miles (1.0)
  - River Miles (0.5)
  - 2020 Centerline
  - Reach Boundary
  - Improve Thermal Refugia
  - Dam Removal
- Restore Banklines with LWD
  - LWD Placements
  - Side Channel
  - Hyporheic Off-Channel Habitat
  - Riparian Fencing
  - Bank Shaping and Stabilization
  - Removal of Bank Armoring
  - Levee Modification
- Protection
  - Channel Reconstruction
  - Floodplain Pond
  - Remove and/or Relocate Floodplain Infrastructure
  - Wetland Restoration\*
  - Riparian Buffer Planting
  - Restore Floodplain Topography and Vegetation
  - Upland Vegetation Treatment
  - Floodplain Excavation
  - Alcove

\*based on NWI Existing Wetlands (2023)

Umatilla River Assessment  
Reach-by-Reach Map Book

Reach UM34  
Restoration Actions





Reach Opportunities

Reach Name: UM35

Prioritization Tier:

Tier 2

Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (8) Water Management-Improve Irrigation Efficiency
- (9) Acquire or Increase Instream Flow (Lease/Purchase; GW Storage)
- (18) Restore Banklines with LWD - Bioengineering
- (20) LWD Placements - Individual Whole Trees, Logjams, etc.
- (22) Levee Modifications: Removal, Setback, Breach
- (23) Remove and/or Relocate Floodplain Infrastructure
- (28) Secondary Channel (non-perennial)



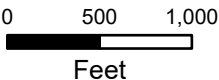
Legend

- River Miles (1.0)
  - River Miles (0.5)
  - 2020 Centerline
  - ▬ Reach Boundary
  - Improve Thermal Refugia
  - Dam Removal
- Restore Banklines with LWD
  - LWD Placements
  - Side Channel
  - Hyporheic Off-Channel Habitat
  - Riparian Fencing
  - Bank Shaping and Stabilization
  - Removal of Bank Armoring
  - Levee Modification
- Protection
  - Channel Reconstruction
  - Floodplain Pond
  - Remove and/or Relocate Floodplain Infrastructure
  - Wetland Restoration\*
  - Riparian Buffer Planting
  - Restore Floodplain Topography and Vegetation
  - Upland Vegetation Treatment
  - Floodplain Excavation
  - Alcove

\*based on NWI Existing Wetlands (2023)

Umatilla River Assessment  
Reach-by-Reach Map Book

Reach UM35  
Restoration Actions





Reach Opportunities

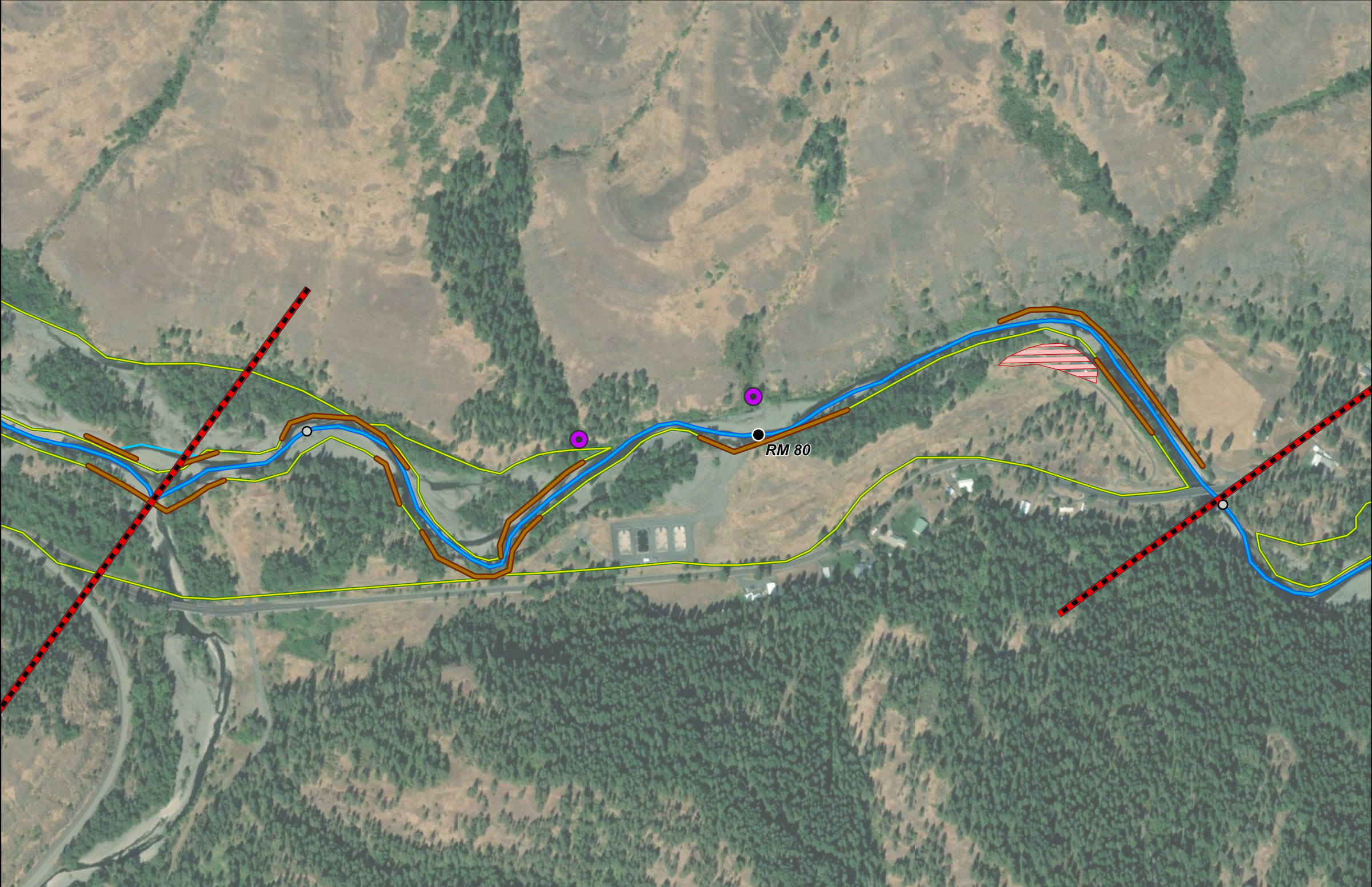
Reach Name: UM36

Prioritization Tier:

Tier 2

Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (8) Water Management-Improve Irrigation Efficiency
- (9) Acquire or Increase Instream Flow (Lease/Purchase; GW Storage)
- (20) LWD Placements - Individual Whole Trees, Logjams, etc.
- (23) Remove and/or Relocate Floodplain Infrastructure
- (26) Improve Thermal Refugia (reconnect cold springs, winter temps)



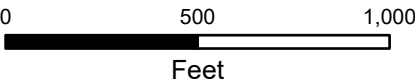
Legend

- River Miles (1.0)
  - River Miles (0.5)
  - 2020 Centerline
  - ▬ Reach Boundary
  - Improve Thermal Refugia
  - Dam Removal
- Restore Banklines with LWD
  - LWD Placements
  - Side Channel
  - Hyporheic Off-Channel Habitat
  - Riparian Fencing
  - Bank Shaping and Stabilization
  - Removal of Bank Armoring
  - Levee Modification
- Protection
  - Channel Reconstruction
  - Floodplain Pond
  - Remove and/or Relocate Floodplain Infrastructure
  - Wetland Restoration\*
  - Riparian Buffer Planting
  - Restore Floodplain Topography and Vegetation
  - Upland Vegetation Treatment
  - Floodplain Excavation
  - Alcove

\*based on NWI Existing Wetlands (2023)

Umatilla River Assessment  
Reach-by-Reach Map Book

Reach UM36  
Restoration Actions





Reach Opportunities

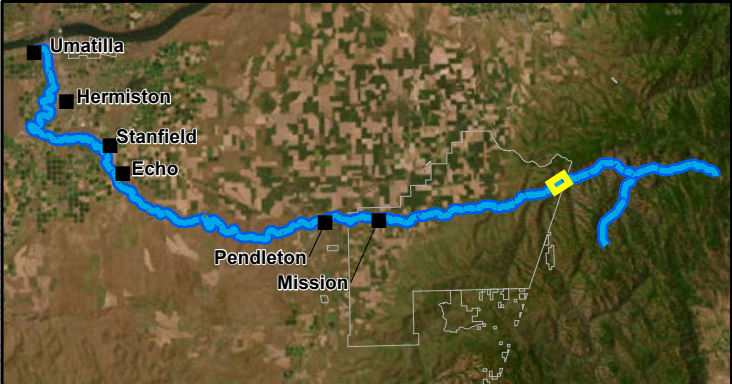
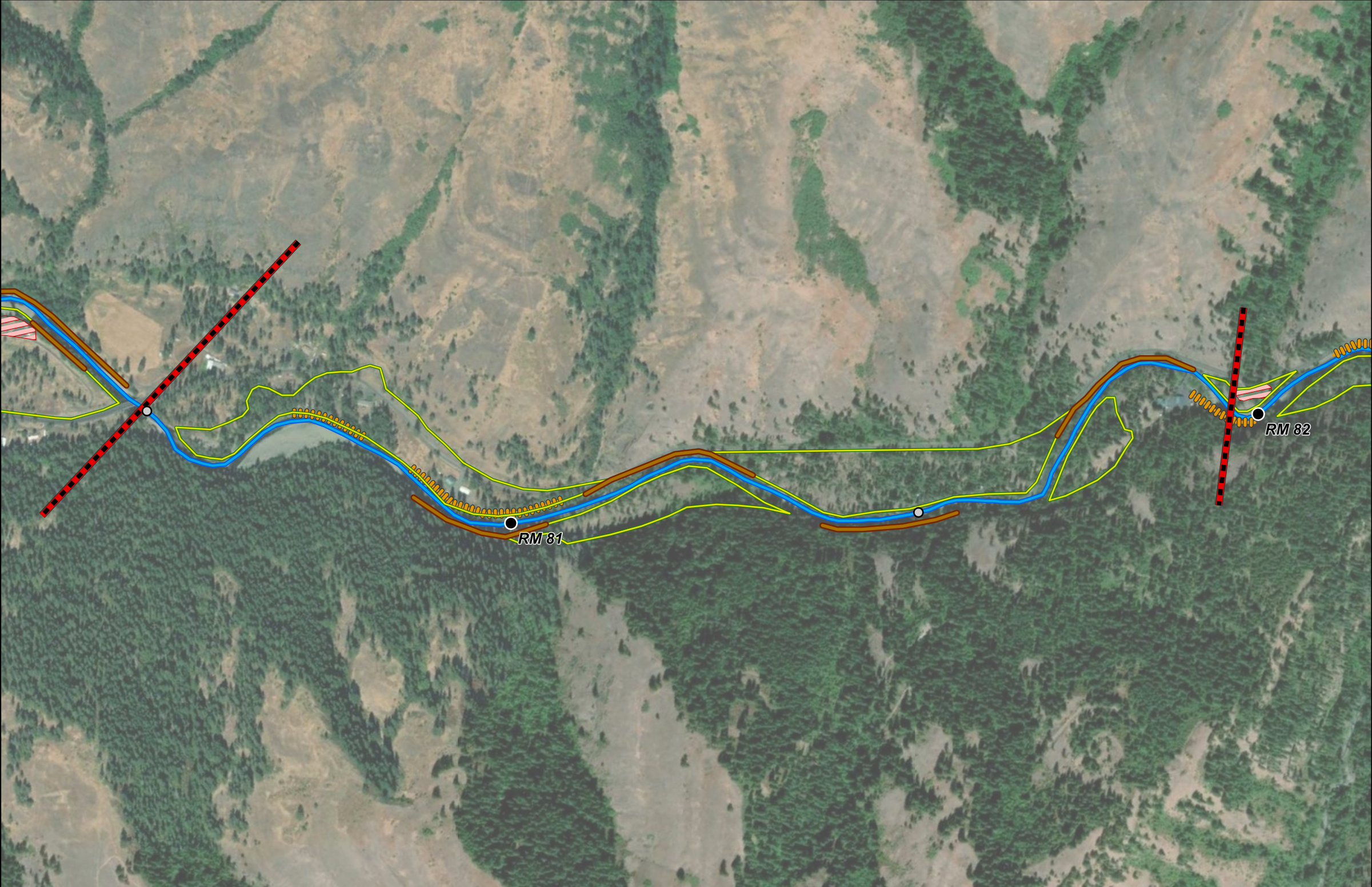
Reach Name: UM37

Prioritization Tier:

Tier 3

Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (8) Water Management-Improve Irrigation Efficiency
- (9) Acquire or Increase Instream Flow (Lease/Purchase; GW Storage)
- (11) Off-Site Water Developments
- (18) Restore Banklines with LWD - Bioengineering
- (20) LWD Placements - Individual Whole Trees, Logjams, etc.



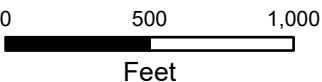
Legend

- River Miles (1.0)
  - River Miles (0.5)
  - 2020 Centerline
  - ▬ Reach Boundary
  - Improve Thermal Refugia
  - Dam Removal
- Restore Banklines with LWD
  - LWD Placements
  - Side Channel
  - Hyporheic Off-Channel Habitat
  - Riparian Fencing
  - Bank Shaping and Stabilization
  - Removal of Bank Armoring
  - Levee Modification
- Protection
  - Channel Reconstruction
  - Floodplain Pond
  - Remove and/or Relocate Floodplain Infrastructure
  - Wetland Restoration\*
  - Riparian Buffer Planting
  - Restore Floodplain Topography and Vegetation
  - Upland Vegetation Treatment
  - Floodplain Excavation
  - Alcove

\*based on NWI Existing Wetlands (2023)

Umatilla River Assessment  
Reach-by-Reach Map Book

Reach UM37  
Restoration Actions





Reach Opportunities

Reach Name: UM38

Prioritization Tier:

Tier 3

Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (8) Water Management-Improve Irrigation Efficiency
- (9) Acquire or Increase Instream Flow (Lease/Purchase; GW Storage)
- (18) Restore Banklines with LWD - Bioengineering
- (20) LWD Placements - Individual Whole Trees, Logjams, etc.
- (23) Remove and/or Relocate Floodplain Infrastructure



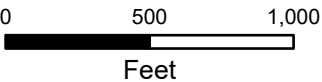
Legend

- |                         |                                |  |
|-------------------------|--------------------------------|--|
| ● River Miles (1.0)     | Restore Banklines with LWD     | Protection                                       |
| ○ River Miles (0.5)     | LWD Placements                 | Channel Reconstruction                           |
| 2020 Centerline         | Side Channel                   | Floodplain Pond                                  |
| Reach Boundary          | Hyporheic Off-Channel Habitat  | Remove and/or Relocate Floodplain Infrastructure |
| Improve Thermal Refugia | Riparian Fencing               | Wetland Restoration*                             |
| Dam Removal             | Bank Shaping and Stabilization | Riparian Buffer Planting                         |
|                         | Removal of Bank Armoring       | Restore Floodplain Topography and Vegetation     |
|                         | Levee Modification             | Upland Vegetation Treatment                      |
|                         |                                | Floodplain Excavation                            |
|                         |                                | Alcove   |

\*based on NWI Existing Wetlands (2023)

Umatilla River Assessment  
Reach-by-Reach Map Book

Reach UM38  
Restoration Actions





Reach Opportunities

Reach Name: UM39

Prioritization Tier:

Tier 3

Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (8) Water Management-Improve Irrigation Efficiency
- (9) Acquire or Increase Instream Flow (Lease/Purchase; GW Storage)
- (18) Restore Banklines with LWD - Bioengineering
- (20) LWD Placements - Individual Whole Trees, Logjams, etc.
- (23) Remove and/or Relocate Floodplain Infrastructure



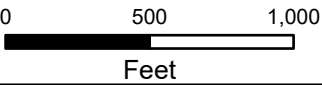
Legend

- River Miles (1.0)
  - River Miles (0.5)
  - 2020 Centerline
  - Reach Boundary
  - Improve Thermal Refugia
  - Dam Removal
- Restore Banklines with LWD
  - LWD Placements
  - Side Channel
  - Hyporheic Off-Channel Habitat
  - Riparian Fencing
  - Bank Shaping and Stabilization
  - Removal of Bank Armoring
  - Levee Modification
- Protection
  - Channel Reconstruction
  - Floodplain Pond
  - Remove and/or Relocate Floodplain Infrastructure
  - Wetland Restoration\*
  - Riparian Buffer Planting
  - Restore Floodplain Topography and Vegetation
  - Upland Vegetation Treatment
  - Floodplain Excavation
  - Alcove

\*based on NWI Existing Wetlands (2023)

Umatilla River Assessment  
Reach-by-Reach Map Book

Reach UM39  
Restoration Actions





Reach Opportunities

Reach Name: UM40

Prioritization Tier:

Tier 3

Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (8) Water Management-Improve Irrigation Efficiency
- (9) Acquire or Increase Instream Flow (Lease/Purchase; GW Storage)
- (18) Restore Banklines with LWD - Bioengineering
- (20) LWD Placements - Individual Whole Trees, Logjams, etc.
- (23) Remove and/or Relocate Floodplain Infrastructure



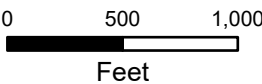
Legend

- River Miles (1.0)
  - River Miles (0.5)
  - 2020 Centerline
  - Reach Boundary
  - Improve Thermal Refugia
  - Dam Removal
- Restore Banklines with LWD
  - LWD Placements
  - Side Channel
  - Hyporheic Off-Channel Habitat
  - Riparian Fencing
  - Bank Shaping and Stabilization
  - Removal of Bank Armoring
  - Levee Modification
- Protection
  - Channel Reconstruction
  - Floodplain Pond
  - Remove and/or Relocate Floodplain Infrastructure
  - Wetland Restoration\*
  - Riparian Buffer Planting
  - Restore Floodplain Topography and Vegetation
  - Upland Vegetation Treatment
  - Floodplain Excavation
  - Alcove

\*based on NWI Existing Wetlands (2023)

Umatilla River Assessment  
Reach-by-Reach Map Book

Reach UM40  
Restoration Actions





## Reach Opportunities

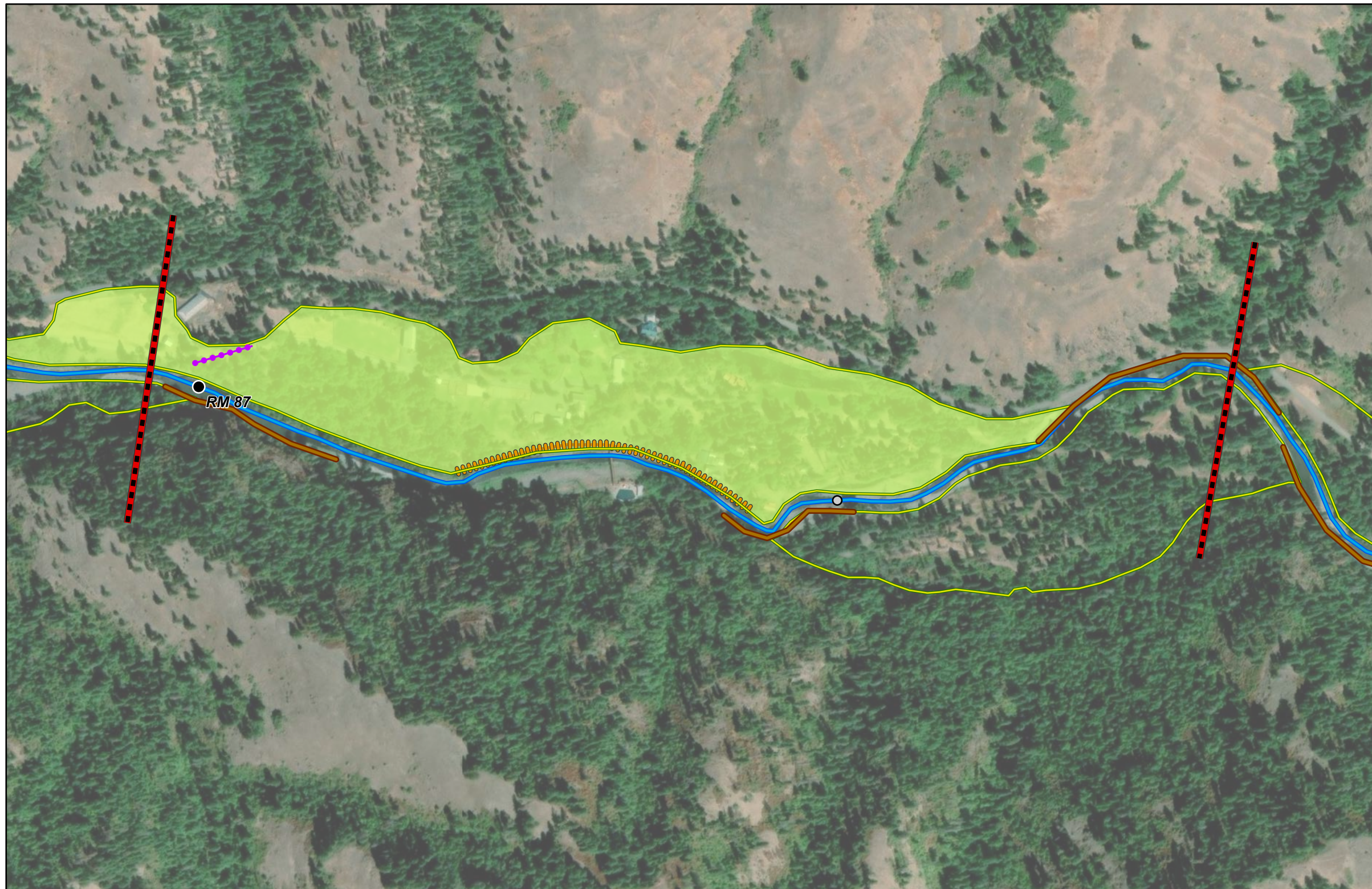
**Reach Name:** UM41

<b>Prioritization Tier:</b> <b>Tier 3</b>
--

### Restoration Actions:

(1) Protection: (Acquisitions, Easements, Coop. Agreements)























- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (8) Water Management-Improve Irrigation Efficiency
- (9) Acquire or Increase Instream Flow (Lease/Purchase; GW Storage)
- (22) Levee Modifications: Removal, Setback, Breach
- (24) Restoration of Floodplain Topography and Vegetation
- (20) LWD Placements - Individual Whole Trees, Logjams, etc.
- (18) Restore Banklines with LWD - Bioengineering















































## Legend























● River Miles (1.0)	Restore Banklines with LWD	Protection
○ River Miles (0.5)	LWD Placements	Channel Reconstruction
— 2020 Centerline	Side Channel	Floodplain Pond
Reach Boundary	Hyporheic Off-Channel Habitat	Remove and/or Relocate Floodplain Infrastructure
Improve Thermal Refugia	Riparian Fencing	Wetland Restoration*
Dam Removal	Bank Shaping and Stabilization	Riparian Buffer Planting
	Removal of Bank Armoring	Restore Floodplain Topography and Vegetation
	Levee Modification	Upland Vegetation Treatment
		Floodplain Excavation
		Alcove

*\*based on NWI Existing Wetlands (2023)*

- |   |  |   |
|---|--|---|
| ● River Miles (1.0)   |  Restore Banklines with LWD     |  Protection                                       |
| ○ River Miles (0.5)   |  LWD Placements                 |  Channel Reconstruction                           |
|  2020 Centerline         |  Side Channel                   |  Floodplain Pond                                  |
|  Reach Boundary          |  Hyporheic Off-Channel Habitat  |  Remove and/or Relocate Floodplain Infrastructure |
|  Improve Thermal Refugia |  Riparian Fencing               |  Wetland Restoration*                             |
|  Dam Removal             |  Bank Shaping and Stabilization |  Riparian Buffer Planting                         |
|   |  Removal of Bank Armoring       |  Restore Floodplain Topography and Vegetation     |
|   |  Levee Modification             |  Upland Vegetation Treatment                      |
|   |  |  Floodplain Excavation                            |
|   |  |  Alcove   |
- \*based on NWI Existing Wetlands (2023)*

- |   |  |   |
|---|--|---|
| ● River Miles (1.0)   |  Restore Banklines with LWD     |  Protection                                       |
| ○ River Miles (0.5)   |  LWD Placements                 |  Channel Reconstruction                           |
|  2020 Centerline         |  Side Channel                   |  Floodplain Pond                                  |
|  Reach Boundary          |  Hyporheic Off-Channel Habitat  |  Remove and/or Relocate Floodplain Infrastructure |
|  Improve Thermal Refugia |  Riparian Fencing               |  Wetland Restoration*                             |
|  Dam Removal             |  Bank Shaping and Stabilization |  Riparian Buffer Planting                         |
|   |  Removal of Bank Armoring       |  Restore Floodplain Topography and Vegetation     |
|   |  Levee Modification             |  Upland Vegetation Treatment                      |
|   |  |  Floodplain Excavation                            |
|   |  |  Alcove   |
- \*based on NWI Existing Wetlands (2023)*

- |   |  |   |
|---|--|---|
| ● River Miles (1.0)   |  Restore Banklines with LWD     |  Protection                                       |
| ○ River Miles (0.5)   |  LWD Placements                 |  Channel Reconstruction                           |
|  2020 Centerline         |  Side Channel                   |  Floodplain Pond                                  |
|  Reach Boundary          |  Hyporheic Off-Channel Habitat  |  Remove and/or Relocate Floodplain Infrastructure |
|  Improve Thermal Refugia |  Riparian Fencing               |  Wetland Restoration*                             |
|  Dam Removal             |  Bank Shaping and Stabilization |  Riparian Buffer Planting                         |
|   |  Removal of Bank Armoring       |  Restore Floodplain Topography and Vegetation     |
|   |  Levee Modification             |  Upland Vegetation Treatment                      |
|   |  |  Floodplain Excavation                            |
|   |  |  Alcove   |
- \*based on NWI Existing Wetlands (2023)*

● River Miles (1.0)	 Restore Banklines with LWD	 Protection
○ River Miles (0.5)	 LWD Placements	 Channel Reconstruction
 2020 Centerline	 Side Channel	 Floodplain Pond
 Reach Boundary	 Hyporheic Off-Channel Habitat	 Remove and/or Relocate Floodplain Infrastructure
 Improve Thermal Refugia	 Riparian Fencing	 Wetland Restoration*
 Dam Removal	 Bank Shaping and Stabilization	 Riparian Buffer Planting
	 Removal of Bank Armoring	 Restore Floodplain Topography and Vegetation
	 Levee Modification	 Upland Vegetation Treatment
		 Floodplain Excavation
		 Alcove

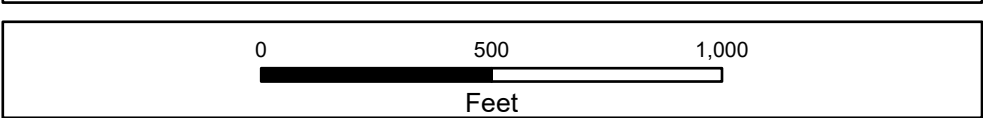
*\*based on NWI Existing Wetlands (2023)*

# Umatilla River Assessment Reach-by-Reach Map Book

Reach UM41  
Restoration Actions

0 500 1,000

Feet





Reach Opportunities

Reach Name: UM42

Prioritization Tier:

Tier 1

Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (8) Water Management-Improve Irrigation Efficiency
- (9) Acquire or Increase Instream Flow (Lease/Purchase; GW Storage)
- (20) LWD Placements - Individual Whole Trees, Logjams, etc.
- (22) Levee Modifications: Removal, Setback, Breach



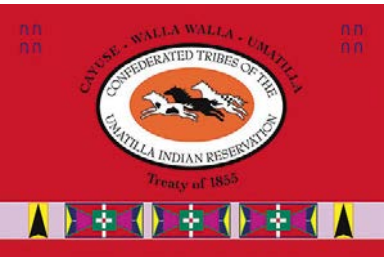
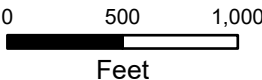
Legend

- River Miles (1.0)
  - River Miles (0.5)
  - 2020 Centerline
  - ▬ Reach Boundary
  - Improve Thermal Refugia
  - Dam Removal
- Restore Banklines with LWD
  - LWD Placements
  - Side Channel
  - Hyporheic Off-Channel Habitat
  - Riparian Fencing
  - Bank Shaping and Stabilization
  - Removal of Bank Armoring
  - Levee Modification
- Protection
  - Channel Reconstruction
  - Floodplain Pond
  - Remove and/or Relocate Floodplain Infrastructure
  - Wetland Restoration\*
  - Riparian Buffer Planting
  - Restore Floodplain Topography and Vegetation
  - Upland Vegetation Treatment
  - Floodplain Excavation
  - Alcove

\*based on NWI Existing Wetlands (2023)

Umatilla River Assessment  
Reach-by-Reach Map Book

Reach UM42  
Restoration Actions





Reach Opportunities

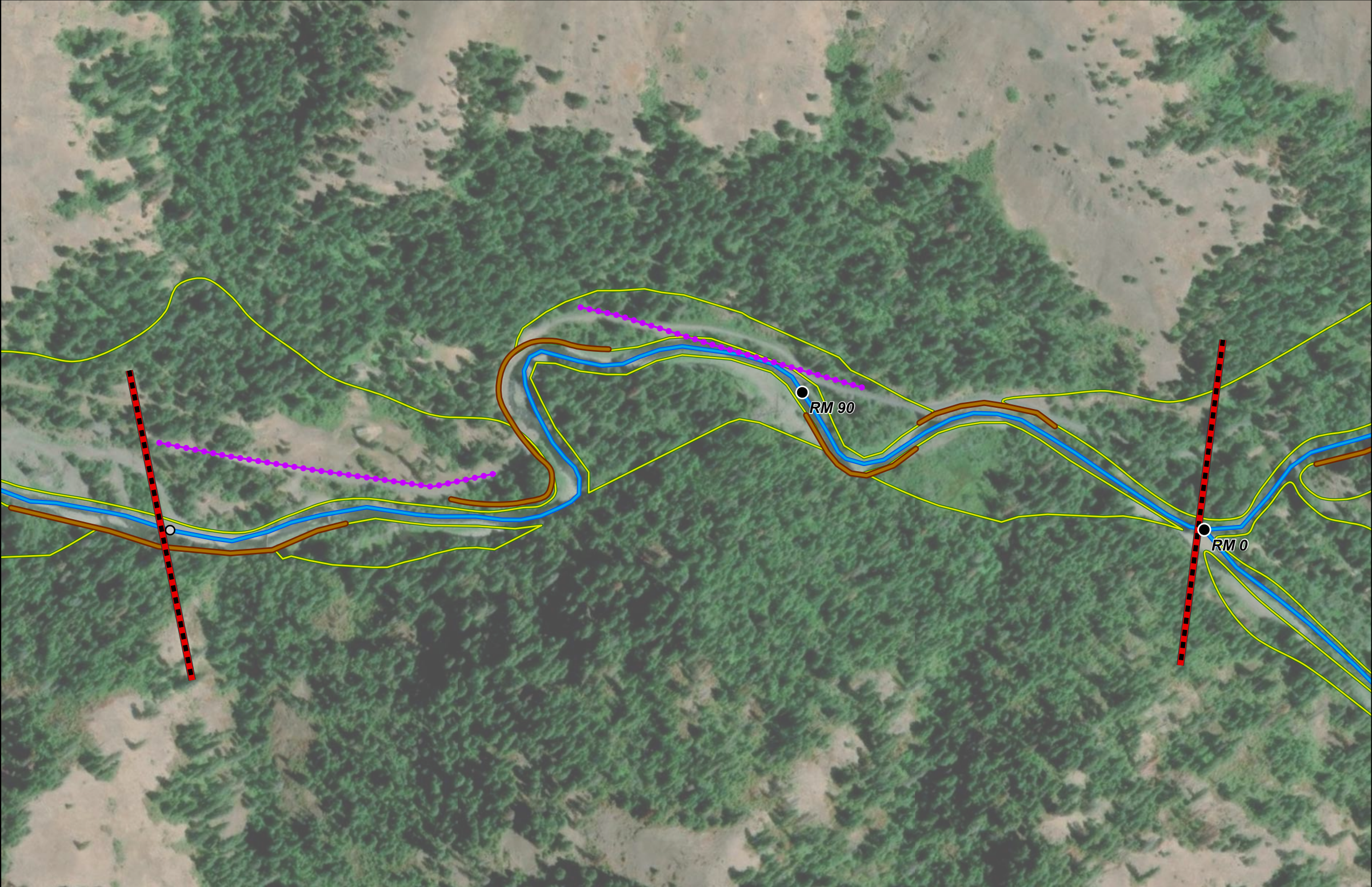
Reach Name: UM43

Prioritization Tier:

Tier 3

Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (8) Water Management-Improve Irrigation Efficiency
- (9) Acquire or Increase Instream Flow (Lease/Purchase; GW Storage)
- (20) LWD Placements - Individual Whole Trees, Logjams, etc.



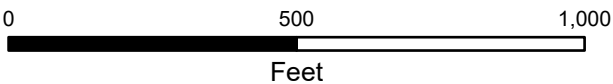
Legend

- River Miles (1.0)
  - River Miles (0.5)
  - 2020 Centerline
  - Reach Boundary
  - Improve Thermal Refugia
  - Dam Removal
- Restore Banklines with LWD
  - LWD Placements
  - Side Channel
  - Hyporheic Off-Channel Habitat
  - Riparian Fencing
  - Bank Shaping and Stabilization
  - Removal of Bank Armoring
  - Levee Modification
- Protection
  - Channel Reconstruction
  - Floodplain Pond
  - Remove and/or Relocate Floodplain Infrastructure
  - Wetland Restoration\*
  - Riparian Buffer Planting
  - Restore Floodplain Topography and Vegetation
  - Upland Vegetation Treatment
  - Floodplain Excavation
  - Alcove

\*based on NWI Existing Wetlands (2023)

Umatilla River Assessment  
Reach-by-Reach Map Book

Reach UM43  
Restoration Actions





Reach Opportunities

Reach Name: NF1

Prioritization Tier:

Conservation or Restoration

Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (11) Off--Site Water Developments
- (20) LWD Placements - Individual Whole Trees, Logjams, etc.



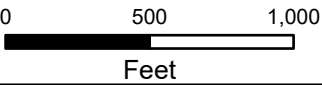
Legend

- |                         |                                |  |
|-------------------------|--------------------------------|--|
| ● River Miles (1.0)     | Restore Banklines with LWD     | Protection                                       |
| ○ River Miles (0.5)     | LWD Placements                 | Channel Reconstruction                           |
| 2020 Centerline         | Side Channel                   | Floodplain Pond                                  |
| Reach Boundary          | Hyporheic Off-Channel Habitat  | Remove and/or Relocate Floodplain Infrastructure |
| Improve Thermal Refugia | Riparian Fencing               | Wetland Restoration*                             |
| Dam Removal             | Bank Shaping and Stabilization | Riparian Buffer Planting                         |
|                         | Removal of Bank Armoring       | Restore Floodplain Topography and Vegetation     |
|                         | Levee Modification             | Upland Vegetation Treatment                      |
|                         |                                | Floodplain Excavation                            |
|                         |                                | Alcove   |

\*based on NWI Existing Wetlands (2023)

Umatilla River Assessment  
Reach-by-Reach Map Book

Reach NF1  
Restoration Actions





# Reach Opportunities

Reach Name: NF2

Prioritization Tier:

Conservation or Restoration

## Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (8) Water Management-Improve Irrigation Efficiency
- (9) Acquire or Increase Instream Flow (Lease/Purchase; GW Storage)
- (11) Off-Site Water Developments



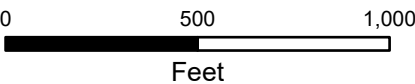
## Legend

- |                         |                                |  |
|-------------------------|--------------------------------|--|
| ● River Miles (1.0)     | Restore Banklines with LWD     | Protection                                       |
| ○ River Miles (0.5)     | LWD Placements                 | Channel Reconstruction                           |
| 2020 Centerline         | Side Channel                   | Floodplain Pond                                  |
| Reach Boundary          | Hyporheic Off-Channel Habitat  | Remove and/or Relocate Floodplain Infrastructure |
| Improve Thermal Refugia | Riparian Fencing               | Wetland Restoration*                             |
| Dam Removal             | Bank Shaping and Stabilization | Riparian Buffer Planting                         |
|                         | Removal of Bank Armoring       | Restore Floodplain Topography and Vegetation     |
|                         | Levee Modification             | Upland Vegetation Treatment                      |
|                         |                                | Floodplain Excavation                            |
|                         |                                | Alcove   |

\*based on NWI Existing Wetlands (2023)

## Umatilla River Assessment Reach-by-Reach Map Book

Reach NF2  
Restoration Actions





Reach Opportunities

Reach Name: NF3

Prioritization Tier:

Conservation or Restoration

Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (8) Water Management-Improve Irrigation Efficiency
- (9) Acquire or Increase Instream Flow (Lease/Purchase; GW Storage)
- (11) Off-Site Water Developments
- (14) Beaver Re-introduction or Management



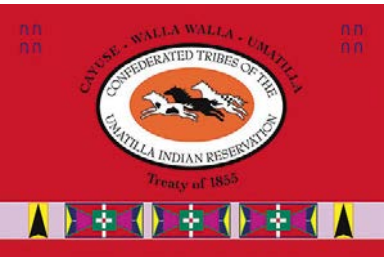
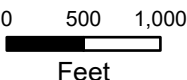
Legend

- |                         |                                |  |
|-------------------------|--------------------------------|--|
| ● River Miles (1.0)     | Restore Banklines with LWD     | Protection                                       |
| ○ River Miles (0.5)     | LWD Placements                 | Channel Reconstruction                           |
| 2020 Centerline         | Side Channel                   | Floodplain Pond                                  |
| Reach Boundary          | Hyporheic Off-Channel Habitat  | Remove and/or Relocate Floodplain Infrastructure |
| Improve Thermal Refugia | Riparian Fencing               | Wetland Restoration*                             |
| Dam Removal             | Bank Shaping and Stabilization | Riparian Buffer Planting                         |
|                         | Removal of Bank Armoring       | Restore Floodplain Topography and Vegetation     |
|                         | Levee Modification             | Upland Vegetation Treatment                      |
|                         |                                | Floodplain Excavation                            |
|                         |                                | Alcove   |

\*based on NWI Existing Wetlands (2023)

Umatilla River Assessment  
Reach-by-Reach Map Book

Reach NF3  
Restoration Actions





Reach Opportunities

Reach Name: NF4

Prioritization Tier:

Conservation or Restoration

Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (8) Water Management-Improve Irrigation Efficiency
- (9) Acquire or Increase Instream Flow (Lease/Purchase; GW Storage)
- (14) Beaver Re-introduction or Management



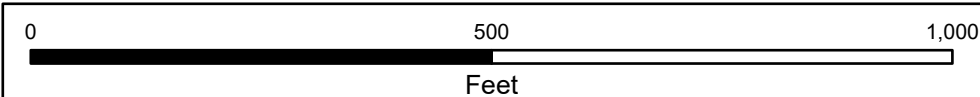
Legend

- |                         |                                |  |
|-------------------------|--------------------------------|--|
| ● River Miles (1.0)     | Restore Banklines with LWD     | Protection                                       |
| ○ River Miles (0.5)     | LWD Placements                 | Channel Reconstruction                           |
| 2020 Centerline         | Side Channel                   | Floodplain Pond                                  |
| Reach Boundary          | Hyporheic Off-Channel Habitat  | Remove and/or Relocate Floodplain Infrastructure |
| Improve Thermal Refugia | Riparian Fencing               | Wetland Restoration*                             |
| Dam Removal             | Bank Shaping and Stabilization | Riparian Buffer Planting                         |
|                         | Removal of Bank Armoring       | Restore Floodplain Topography and Vegetation     |
|                         | Levee Modification             | Upland Vegetation Treatment                      |
|                         |                                | Floodplain Excavation                            |
|                         |                                | Alcove   |

\*based on NWI Existing Wetlands (2023)

Umatilla River Assessment  
Reach-by-Reach Map Book

Reach NF4  
Restoration Actions





Reach Opportunities

Reach Name: NF5

Prioritization Tier:

Conservation or Restoration

Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (8) Water Management-Improve Irrigation Efficiency
- (9) Acquire or Increase Instream Flow (Lease/Purchase; GW Storage)
- (14) Beaver Re-introduction or Management



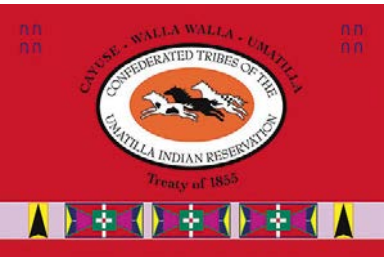
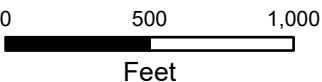
Legend

- |                         |                                |  |
|-------------------------|--------------------------------|--|
| ● River Miles (1.0)     | Restore Banklines with LWD     | Protection                                       |
| ○ River Miles (0.5)     | LWD Placements                 | Channel Reconstruction                           |
| 2020 Centerline         | Side Channel                   | Floodplain Pond                                  |
| Reach Boundary          | Hyporheic Off-Channel Habitat  | Remove and/or Relocate Floodplain Infrastructure |
| Improve Thermal Refugia | Riparian Fencing               | Wetland Restoration*                             |
| Dam Removal             | Bank Shaping and Stabilization | Riparian Buffer Planting                         |
|                         | Removal of Bank Armoring       | Restore Floodplain Topography and Vegetation     |
|                         | Levee Modification             | Upland Vegetation Treatment                      |
|                         |                                | Floodplain Excavation                            |
|                         |                                | Alcove   |

\*based on NWI Existing Wetlands (2023)

Umatilla River Assessment  
Reach-by-Reach Map Book

Reach NF5  
Restoration Actions





Reach Opportunities

Reach Name: NF6

Prioritization Tier:

Conservation or Restoration

Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (8) Water Management-Improve Irrigation Efficiency
- (9) Acquire or Increase Instream Flow (Lease/Purchase; GW Storage)
- (14) Beaver Re-introduction or Management



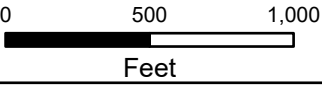
Legend

- |                         |                                |  |
|-------------------------|--------------------------------|--|
| ● River Miles (1.0)     | Restore Banklines with LWD     | Protection                                       |
| ○ River Miles (0.5)     | LWD Placements                 | Channel Reconstruction                           |
| 2020 Centerline         | Side Channel                   | Floodplain Pond                                  |
| Reach Boundary          | Hyporheic Off-Channel Habitat  | Remove and/or Relocate Floodplain Infrastructure |
| Improve Thermal Refugia | Riparian Fencing               | Wetland Restoration*                             |
| Dam Removal             | Bank Shaping and Stabilization | Riparian Buffer Planting                         |
|                         | Removal of Bank Armoring       | Restore Floodplain Topography and Vegetation     |
|                         | Levee Modification             | Upland Vegetation Treatment                      |
|                         |                                | Floodplain Excavation                            |
|                         |                                | Alcove   |

\*based on NWI Existing Wetlands (2023)

Umatilla River Assessment  
Reach-by-Reach Map Book

Reach NF6  
Restoration Actions





Reach Opportunities

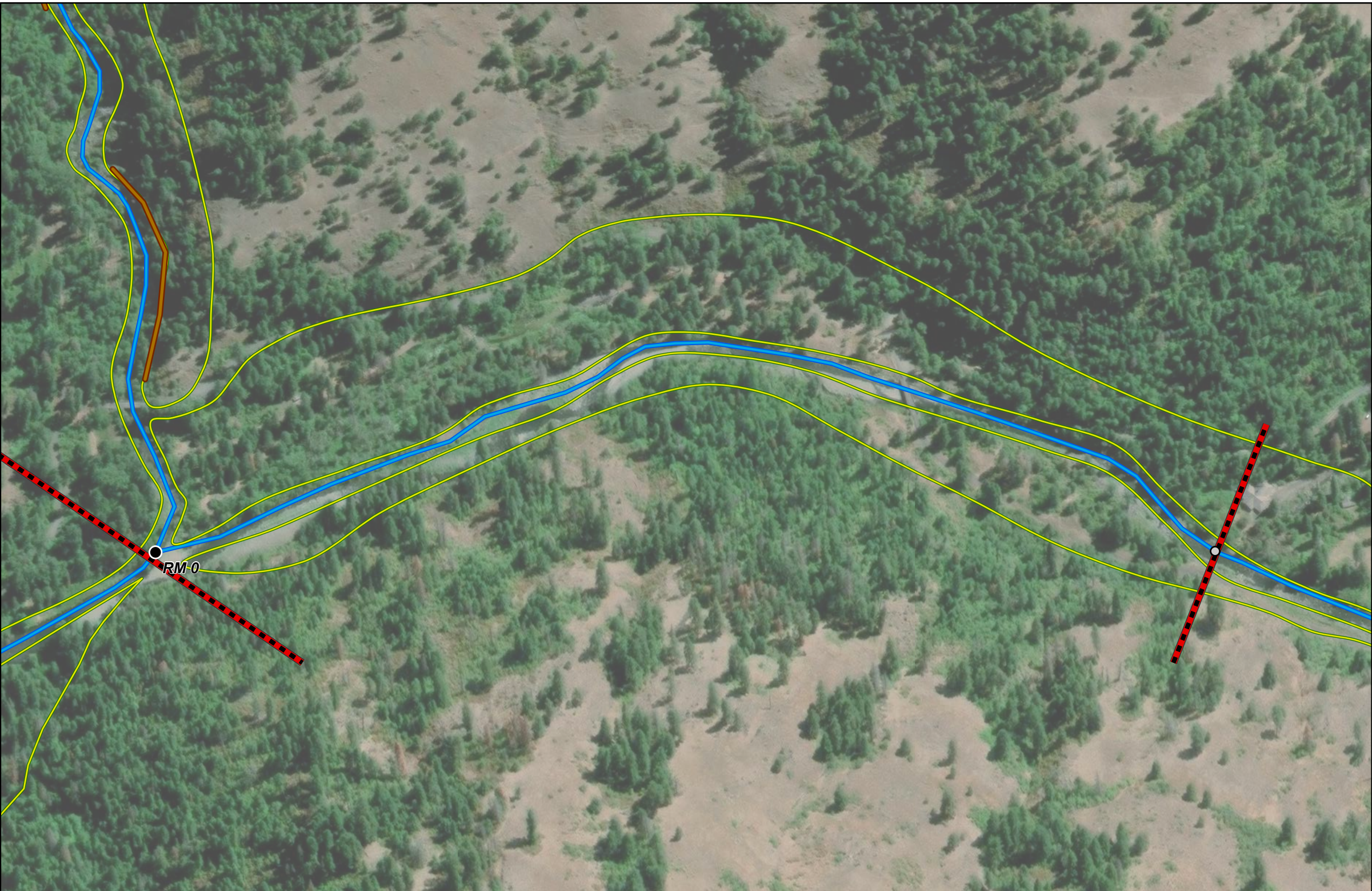
Reach Name: SF1

Prioritization Tier:

Conservation or Restoration

Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (8) Water Management-Improve Irrigation Efficiency
- (9) Acquire or Increase Instream Flow (Lease/Purchase; GW Storage)
- (14) Beaver Re-introduction or Management



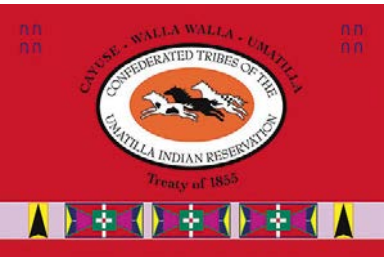
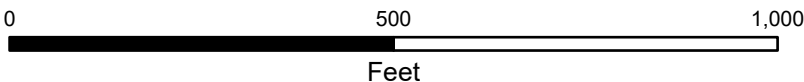
Legend

- |                         |                                |  |
|-------------------------|--------------------------------|--|
| ● River Miles (1.0)     | Restore Banklines with LWD     | Protection                                       |
| ○ River Miles (0.5)     | LWD Placements                 | Channel Reconstruction                           |
| 2020 Centerline         | Side Channel                   | Floodplain Pond                                  |
| Reach Boundary          | Hyporheic Off-Channel Habitat  | Remove and/or Relocate Floodplain Infrastructure |
| Improve Thermal Refugia | Riparian Fencing               | Wetland Restoration*                             |
| Dam Removal             | Bank Shaping and Stabilization | Riparian Buffer Planting                         |
|                         | Removal of Bank Armoring       | Restore Floodplain Topography and Vegetation     |
|                         | Levee Modification             | Upland Vegetation Treatment                      |
|                         |                                | Floodplain Excavation                            |
|                         |                                | Alcove   |

\*based on NWI Existing Wetlands (2023)

Umatilla River Assessment  
Reach-by-Reach Map Book

Reach SF1  
Restoration Actions





Reach Opportunities

Reach Name: SF2

Prioritization Tier:

Conservation or Restoration

Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (8) Water Management-Improve Irrigation Efficiency
- (9) Acquire or Increase Instream Flow (Lease/Purchase; GW Storage)
- (14) Beaver Re-introduction or Management



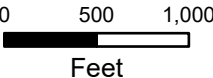
Legend

- |                         |                                |  |
|-------------------------|--------------------------------|--|
| ● River Miles (1.0)     | Restore Banklines with LWD     | Protection                                       |
| ○ River Miles (0.5)     | LWD Placements                 | Channel Reconstruction                           |
| 2020 Centerline         | Side Channel                   | Floodplain Pond                                  |
| Reach Boundary          | Hyporheic Off-Channel Habitat  | Remove and/or Relocate Floodplain Infrastructure |
| Improve Thermal Refugia | Riparian Fencing               | Wetland Restoration*                             |
| Dam Removal             | Bank Shaping and Stabilization | Riparian Buffer Planting                         |
|                         | Removal of Bank Armoring       | Restore Floodplain Topography and Vegetation     |
|                         | Levee Modification             | Upland Vegetation Treatment                      |
|                         |                                | Floodplain Excavation                            |
|                         |                                | Alcove   |

\*based on NWI Existing Wetlands (2023)

Umatilla River Assessment  
Reach-by-Reach Map Book

Reach SF2  
Restoration Actions





Reach Opportunities

Reach Name: SF3

Prioritization Tier:

Conservation or Restoration

Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (14) Beaver Re-introduction or Management



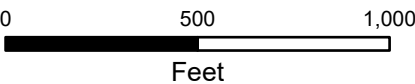
Legend

- River Miles (1.0)
  - River Miles (0.5)
  - 2020 Centerline
  - ▬ Reach Boundary
  - Improve Thermal Refugia
  - Dam Removal
- Restore Banklines with LWD
  - LWD Placements
  - Side Channel
  - Hyporheic Off-Channel Habitat
  - Riparian Fencing
  - Bank Shaping and Stabilization
  - Removal of Bank Armoring
  - Levee Modification
- Protection
  - Channel Reconstruction
  - Floodplain Pond
  - Remove and/or Relocate Floodplain Infrastructure
  - Wetland Restoration\*
  - Riparian Buffer Planting
  - Restore Floodplain Topography and Vegetation
  - Upland Vegetation Treatment
  - Floodplain Excavation
  - Alcove

\*based on NWI Existing Wetlands (2023)

Umatilla River Assessment  
Reach-by-Reach Map Book

Reach SF3  
Restoration Actions





Reach Opportunities

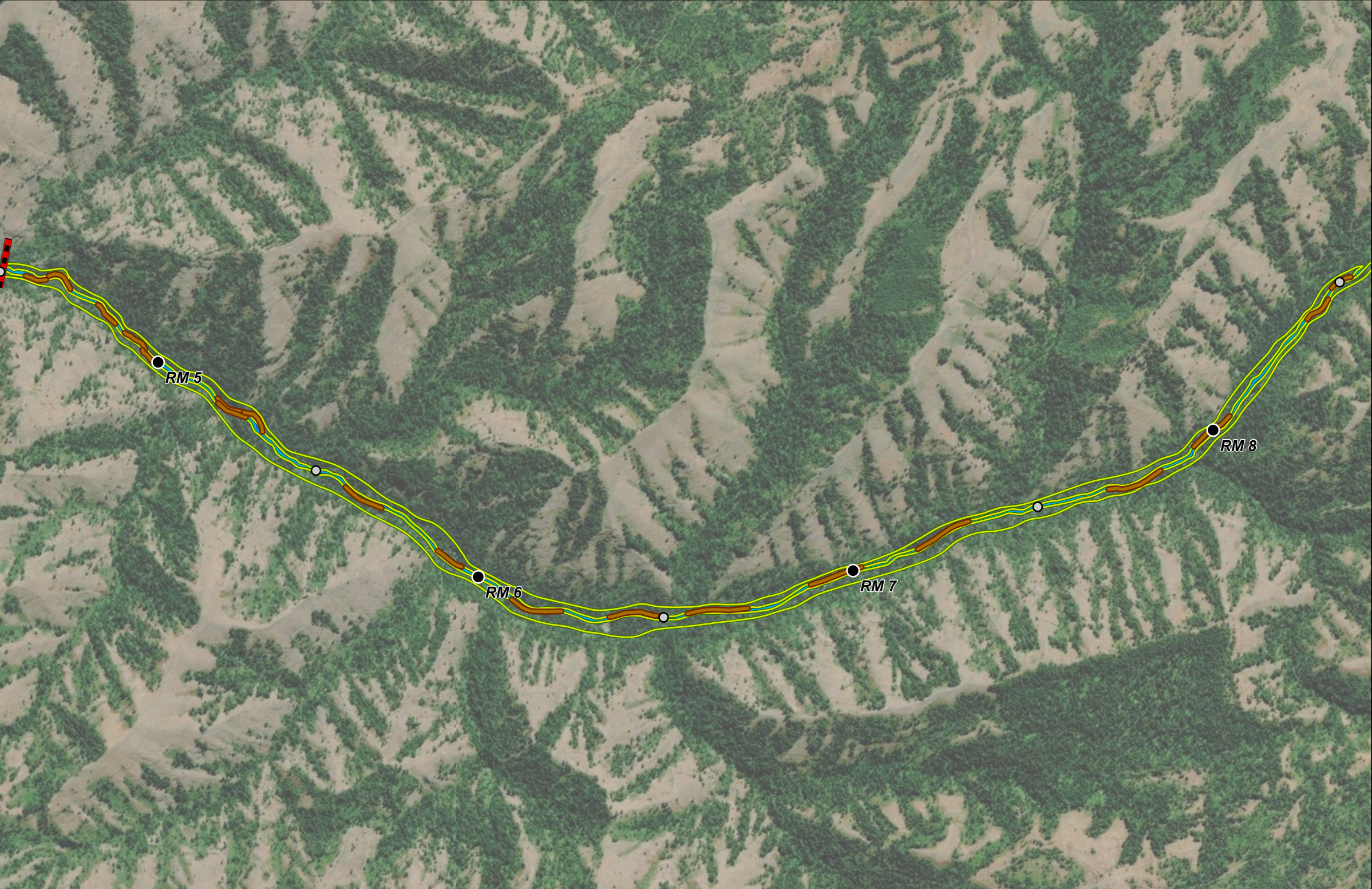
Reach Name: SF4

Prioritization Tier:

Conservation or Restoration

Restoration Actions:

- (1) Protection: (Acquisitions, Easements, Coop. Agreements)
- (2) Land Management: (Grazing Plans, Fire management, etc.)
- (14) Beaver Re-introduction or Management
- (20) LWD Placements - Individual Whole Trees, Logjams, etc.



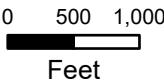
Legend

- River Miles (1.0)
  - River Miles (0.5)
  - 2020 Centerline
  - ▬ Reach Boundary
  - Improve Thermal Refugia
  - Dam Removal
- Restore Banklines with LWD
  - LWD Placements
  - Side Channel
  - Hyporheic Off-Channel Habitat
  - Riparian Fencing
  - Bank Shaping and Stabilization
  - Removal of Bank Armoring
  - Levee Modification
- Protection
  - Channel Reconstruction
  - Floodplain Pond
  - Remove and/or Relocate Floodplain Infrastructure
  - Wetland Restoration\*
  - Riparian Buffer Planting
  - Restore Floodplain Topography and Vegetation
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Reach SF4  
Restoration Actions







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