

River Restoration: Who, Why & What?



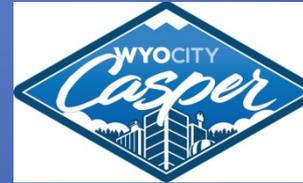
Paul Dey, Wyoming Water Association, October 27, 2016

OUTLINE

- **Governors Water Strategy**
- **River Restoration projects**
- **Stream Functional Pyramid Approach – Quantification Tool**



Partners

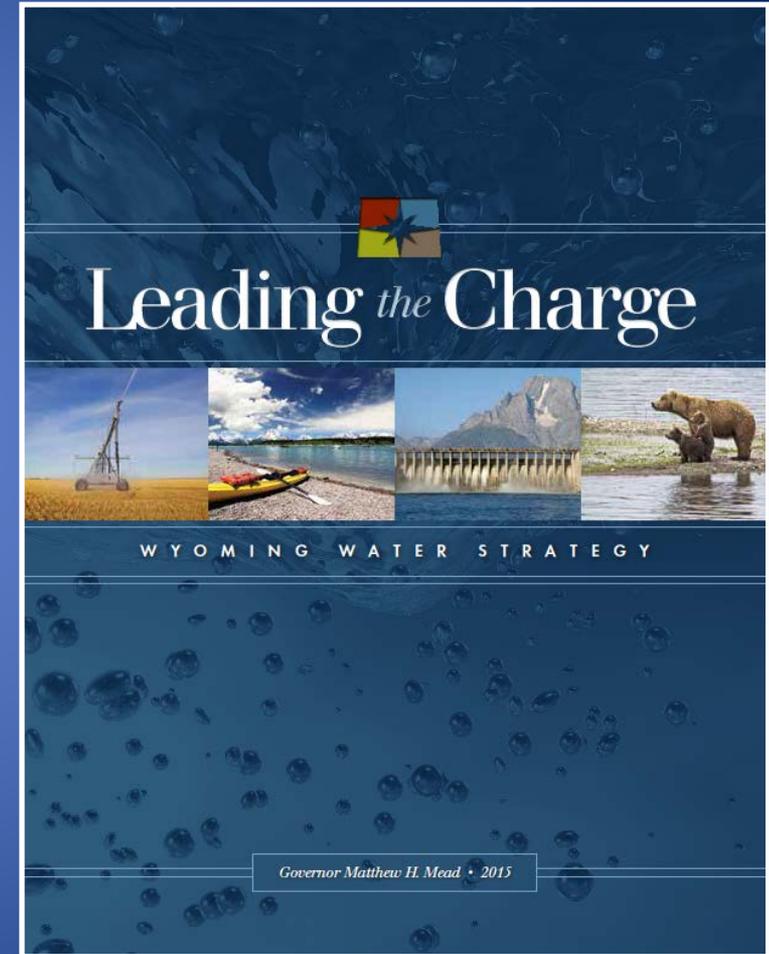


Private landowners



Water Strategy – River Restoration & Fish Passage

- Water Strategy has ten initiatives
- **Outcomes:**
 - Recommendations and a strategy to enhance existing and foster additional, effective stream restoration efforts throughout Wyoming
 - **Increased capacity and flexibility for water users in replacing infrastructure with fish-friendly alternatives while meeting water user needs**
- State agency group formed



Water Strategy – River Restoration & Fish Passage

- **Products Completed**

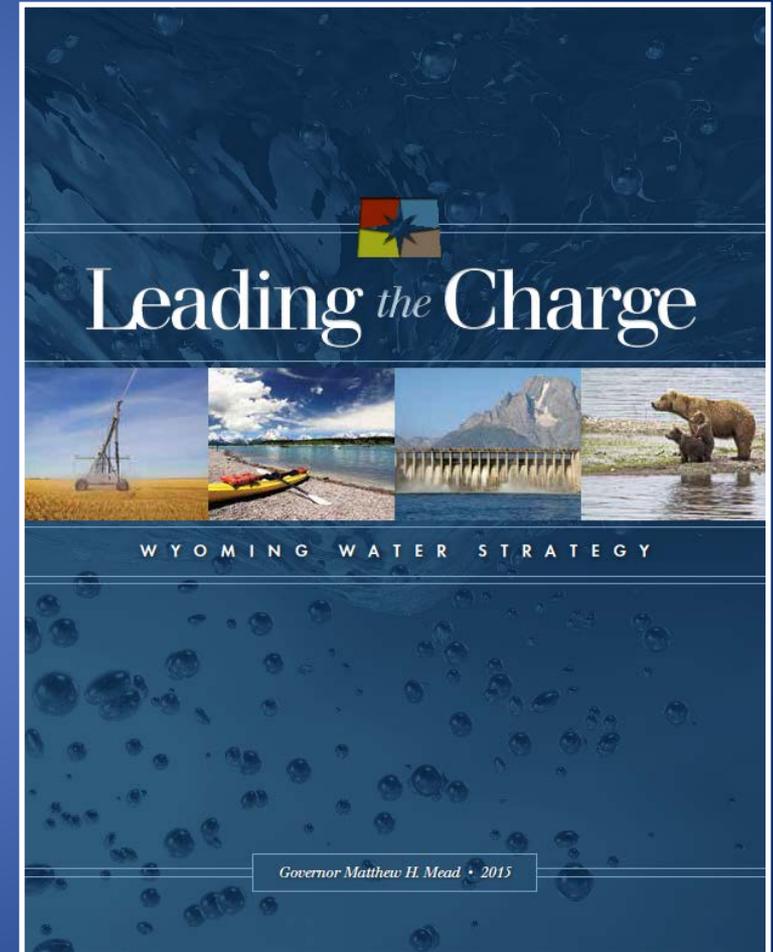
<https://wgfd.wyo.gov/WGFD/media/content/PDF/Habitat/Aquatic%20Habitat/>

- **Funding guidance**

- **Priorities**

- **Agency Resources Document**

- **Facebook page**

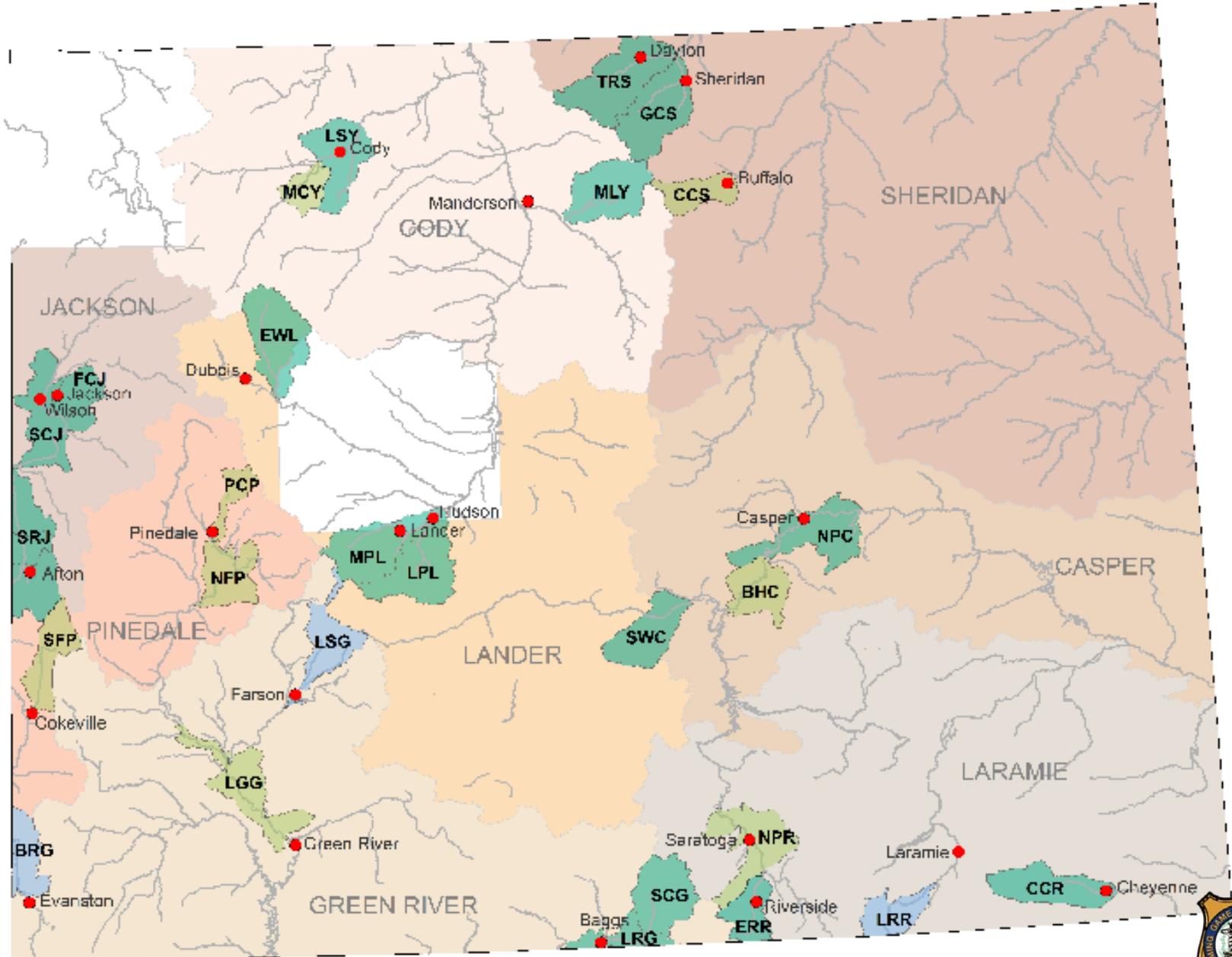


Funding Entity	Key Points	Eligibility	Funding Cycle /Important Date	Website / Contact Info.	Additional Details
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1. Public Funding for Private Landowners, Municipalities, Government Agencies, Non-Governmental Organizations

Wyoming Wildlife and Natural Resource Trust Fund	<ul style="list-style-type: none"> Enhance and conserve wildlife habitat and natural resource values throughout the state 9 member WWNRT board reviews projects and does an on-site tour of every proposal 	<ul style="list-style-type: none"> Any project designed to improve wildlife habitat or natural resource values Individuals are not eligible Will not fund salaries, acquisition of real property, or purchase of water rights 	<ul style="list-style-type: none"> Applications due March 1 and September 1 Decisions in June and December Standard contract is three years 	<p>http://wwnrt.wyo.gov/</p> <p>Grants Manager (307)777-8024</p>	<ul style="list-style-type: none"> Projects >\$200,000 must be submitted by September 1 and are subject to legislative approval in the following March legislative session Can apply for early (design), middle and late funding
Wyoming Game and Fish Department; Trust Fund	<ul style="list-style-type: none"> Habitat proposals scored as outlined in Department Strategic Habitat Plan Trust fund dollars can be granted to various entities, contracted through WGFD or used for materials Work on private land requires an additional cooperative agreement with landowner specifying goals, terms 	<ul style="list-style-type: none"> Any project designed to improve wildlife habitat or natural resource values Projects require a WGFD biologist representative Grants and contracts with all legal entities including private landowners 	<ul style="list-style-type: none"> Applications due to WGFD representative by December 1 Initial screening by WGFD staff in January Preliminary Commission approval in March Final approval and \$\$ available in early July Contracts and grant agreements can be developed early, between March and July, for work performed after early July Grant agreements are 	<p>WGFD Strategic Habitat Plan: https://wgfd.wyo.gov/WGFD/media/content/PDF/Habitat/Strategic%20Habitat%20Plan/SHP2015_Final.pdf</p> <p>Contact Information: https://wgfd.wyo.gov/About-Us/Offices-and-Facilities</p> <p>Cheyenne: Aquatic Habitat Program Manager or Terrestrial</p>	<ul style="list-style-type: none"> Funding can be any amount though most are \$10,000 - \$30,000 per project Reimbursement grant, meaning that funds can be issued to the recipient only after proof of expenditure on eligible costs identified to deliver the approved product Invoices are due to WGFD representative by June 10 Requires high level of coordination with WGFD

STREAM RESTORATION HOTSPOTS AND WGFD FISH REGIONS



 WGFD/WDEQ PRIORITY

 WGFD PRIORITY

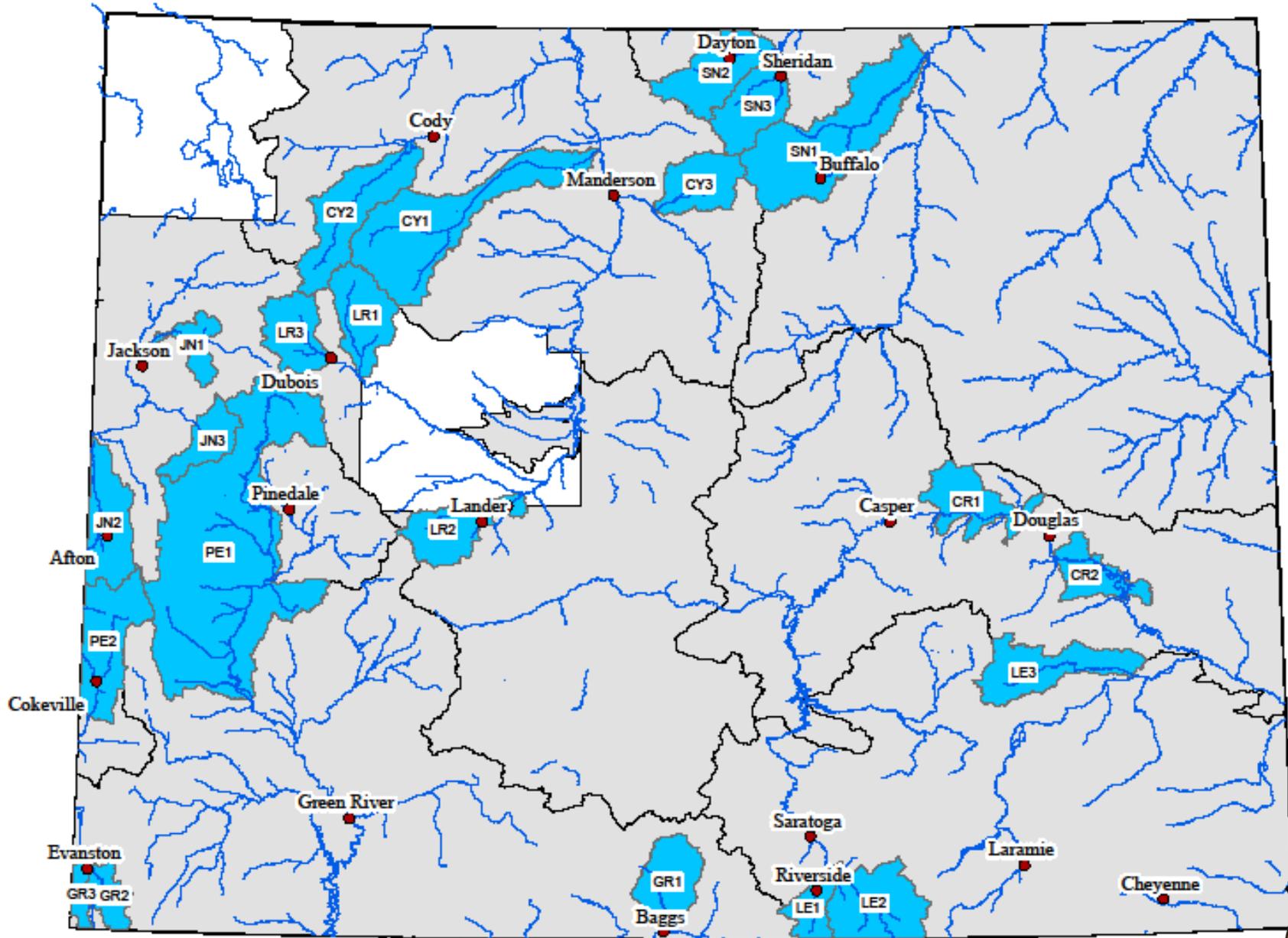
 WDEQ PRIORITY



STREAM RESTORATION HOTSPOTS

Key	Region	10 digit HUC	Watershed or stream name	Community	Projects, comments or reasons for selection
NPC	Casper	1018000703	North Platte Casper	Casper	Multi-phase 14 mile restoration ongoing through Casper.
BHC		1018000701	Bates Hole / Bolton Creek	NA	Beaver restoration in Bolton Ck. Sediment reduction for N. Platte
SWC		1018000609	Sweetwater River	NA	Dumbell Ranch Mitigation Bank
LSY	Cody	1008001401	Lower Shoshone River	Cody	Shoshone R. project proposed downstream from Belfry Bridge
MLY		1008000806	Medicine Lodge Creek	NA	Proposed project on G&F WHMA
MCY		1008001303	Marquette Creek	NA	YSC core population. Passive restoration may be an option.
LGG	Green River	1404010301	Lower Green River	Green River	Russian olive removal & replacement in community of Green R.
SCG		1405000304	Savery Ck blw High Savery Res.	NA	Channel wide & shallow, eroding banks
LRG		1405000302	Little Snake River	Baggs	Extensive stream restoration ongoing
BRG		1601010103	Bear River	Evanston	From the confluence with Woodruff Narrows Reservoirs upstream to the confluence with Sulphur Creek
LSG		1404010402	Little Sandy River	Farson	From the northern boundary of S33/T28N/R104W downstream 17.7 miles to the Sublette/Sweetwater County Line
FCJ	Jackson	1704010302	Flat Creek	Jackson	Multi-phase project ongoing through NWR; possible work further ds
SRJ		17040105	Salt River HUC-8	Afton	Much potential for private land projects & benefits
SCJ		1704010301	Spring Creeks	Wilson	Benefits spawning cutthroat and Snake River fishery
MPL	Lander	1008000302	Middle Fork Popo Agie River	Lander	Ongoing work through Lander with potential upstream & downstream
EWL		1008000104	East Fork Wind River	NA	YSC stronghold, includes Bear Creek and East Fork Wind River
LPL		1008000301	Little Popo Agie R. and Twin Ck.	Hudson	NRCS working with landowners; benefits sauger habitat
ERR	Laramie	1018000205	Encampment River	Riverside	Multiple phases ongoing and future work; large public benefit
NPR		1018000206	North Platte Saratoga	Saratoga	Community looking for long-term solutions; flood concerns
CCR		1019000901	Crow Creek	Cheyenne	Community has TMDL concerns; potential for fishery benefits
LRR		1018001002	Laramie River	Laramie	Upstream of Woods Landing
NFP	Pinedale	1404010203	New Fork River	NA	Gas Wells project on BLM proposed; efforts ongoing on private
SFP		1601010202	Smiths Fork River	Cokeville	Riparian restoration work has been proposed
PCP		1404010202	Pine Creek	Pinedale	Plans developed, further action depends on interest/support/funding
TRS	Sheridan	1009010101	Tongue River	Dayton	An assessment has been completed and is a basis for projects
GCS		1009010102	Goose Creek	Sheridan	COE Flood mitigation project ongoing
CCS		1009020601	Clear Creek	Buffalo	Buffalo investing in greenbelt; Big Bull Reservoir alternatives under consideration

Fish Passage Focus Watersheds



FISH PASSAGE FOCUS WATERSHEDS

Key	Region	HUC	Priority HUC name	Projects, comments or reasons for selection
CR1	CR	1018000709	North Platte - Sand Creek	Morton Diversion, sauger restoration potential
CR2		1018000804	North Platte - Glendo Res.	Orin Weir, sauger restoration potential
CY1	CY	10080009	Greybull River	YSC habitat, WWDC projects, many projects completed
CY2		10080013	South Fork Shoshone River	YSC habitat, potential for WWDC projects on large irrigation diversions
CY3		1008000806	Paint Rock Creek	YSC habitat, projects on Med Lodge, WWDC projects
GR1	GR	1405000403	Lower Muddy Creek	3 species conservation, CRC habitat
GR2		1601010102	Bear River - Sulphur Creek	BRC & LSC habitat, 3 species conservation
GR3		1601010104	Yellow Creek	BRC & LSC habitat, 3 species conservation
JN1	JN	1704010203	Lower Gros Ventre River	SGCN species and SRC habitat, location of most irrigation near Jackson
JN2		17040105	Salt River	SGCN species and SRC habitat
JN3		1704010303	Upper Hoback River	SGCN species and SRC habitat
LE1	LE	1018000205	Encampment River	Wild trout sport fishery, abundant restoration work
LE2		1018000202-4	Upper North Platte	High profile wild trout sport fishery, BNT spawning
LE3		1018001106, 11018001107	North Laramie River	SGCN species, key hornyhead chub habitat
LR1	LR	1008000104	East Fork Wind River	YSC habitat, majority is WGF & Federal owned
LR2		1008000302	Popo Agie River	Wild trout sport fishery, sauger habitat, numerous diversions
LR3		1008000101	Wind River - Warm Springs	YSC in some tributaries, SGCN species
PE1	PE	14040101	Upper Green River	CRC habitat, numerous diversions
PE2		16010102	Central Bear River	BRC habitat, numerous diversions
SN1	SN	10090206	Clear Creek	SGCN species, sauger, prairie fish assemblage; BNT fishery above Buffalo
SN2		1009010101	Tongue River - Fool Ck.	YSC habitat, sauger & SGCN species
SN3		1009010102	Goose Creek	Sauger & SGCN species; seasonal flow limitations

STATE AND FEDERAL AGENCY RESOURCES FOR STREAM RESTORATION

Permit/ Regulation/ Recommended Activity	Description	Agency	Contact and Website
WYPDES Storm Water Permits	Some activities require WYPDES permits for storm water discharge, including runoff from large and small construction sites.	Wyoming Department of Environmental Quality, Water Quality Division, WYPDES Program	307-777-7570 http://deq.wyoming.gov/wqd/storm-water-permitting/
WYPDES General Permit for Temporary Discharges Involving Construction Practices	This general permit for temporary discharge will cover activities associated with Construction Activities such as Construction Dewatering; Disinfection of Potable Water Lines; and/or Hydrostatic Testing of Pipes, Tanks, or Other Similar Vessels.	Wyoming Department of Environmental Quality, Water Quality Division, WYPDES Program	307-777-7090 http://deq.wyoming.gov/wqd/permitting/resources/general-permits-and-notice-of-intent/
Temporary Turbidity Waivers	Waiver to authorize temporary increases in turbidity for certain short-term, construction-related activities. Projects working in live waters and activities that may cause an excursion above allowable turbidity levels may qualify for a turbidity waiver.	Wyoming Department of Environmental Quality, Water Quality Division, Watershed Protection Program	307-777-6372 http://deq.wyoming.gov/wqd/cwa-section-401-turbidity-wetland/resources/turbidity/
Clean Water Act Section 404 permits	Any person, firm, or agency (including Federal, state, and local government agencies) planning to work in navigable waters of the United States, or discharge dredged or fill material in waters of the United States, including wetlands, must first obtain a permit from the Corps of Engineers.	United States Army Corps Engineers (USACE), Wyoming Regulatory Office	307-777-772-2300 http://www.nwo.usace.army.mil/Missions/RegulatoryProgram/Wyoming.aspx
Clean Water Act Section 401	The WDEQ Water Quality Division reviews and issues water quality certifications under	Wyoming Department of Environmental Quality, Water Quality Division, Watershed	307-777-6701

Water Strategy – River Restoration & Fish Passage

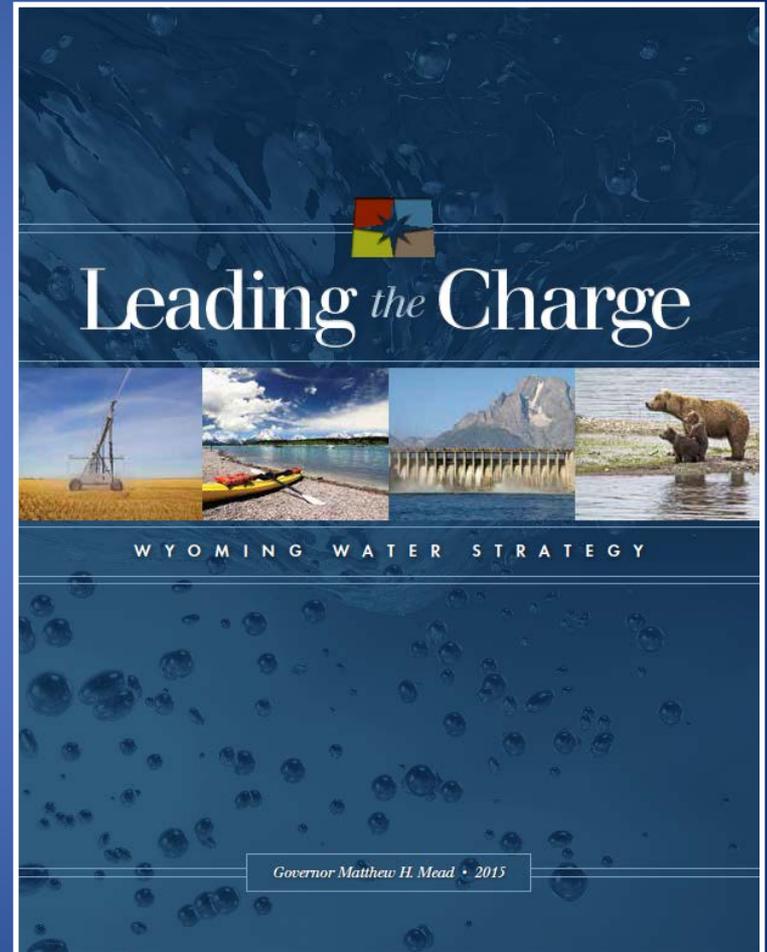
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- Funding guidance
- Priorities
- Agency Resources Document
- Facebook page

- Products in Development

- ~~Engineer Position~~
- Standards / best practices
- Encourage post-construction monitoring, maintenance, and adaptive management
- Workshops
- Storymap



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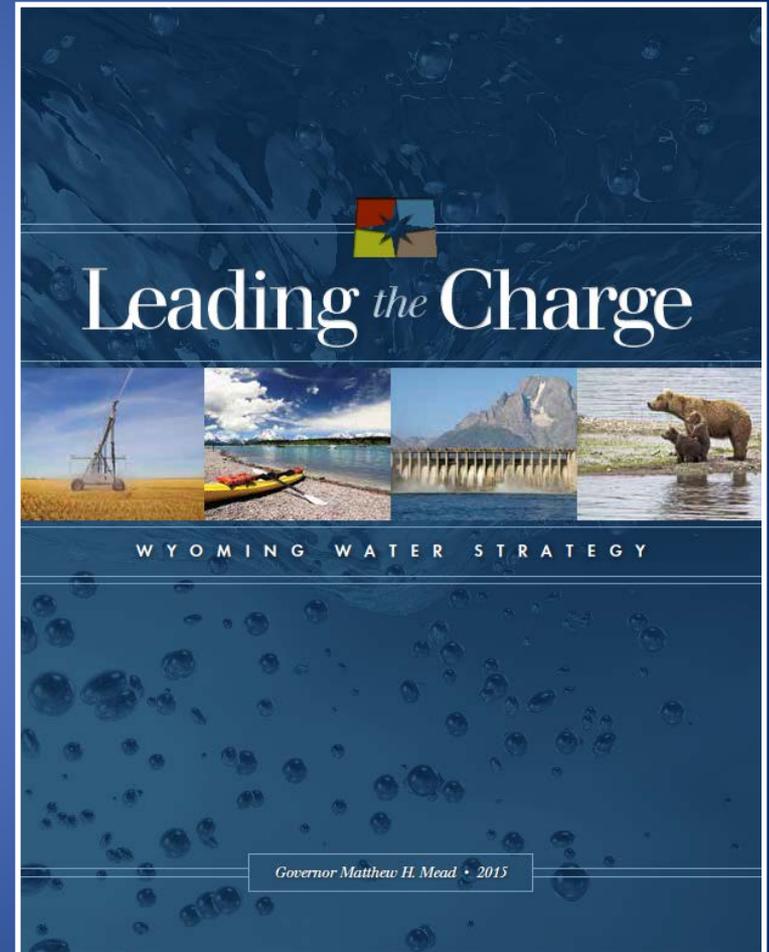
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Current River Restoration Projects

Casper

- Bolton Creek
- North Platte River Restoration

Green River

- Bear River RCPP
- Big Sandy River structures
- Seedskaadee cottonwood regeneration
- Flume Creek
- Green River Urban Riverway
- Little Snake
- Beaver Creek Cottonwood
- Beaver Creek Uinta
- Trout Creek Ramsay
- Muddy Creek Grade Control
- East Muddy Creek
- Savery Creek Habitat Improvement
- Red Creek Riparian
- Gooseberry Creek Riparian
- Currant Creek Culvert and Vanes
- Bear River Blue Bell Diversion
- Albert Creek
- Smiths Fork River
- Clear Creek

Cody

- Sunlight Creek restoration
- Shoshone Riverway
- Medicine Lodge Creek restoration
- Nowood River Harmony Diversion
- Wood River Campground
- Eaglenest Creek
- Lost Creek

Jackson

- Flat Creek Restoration, NER
- EW Crow Creek Ranch
- Edmiston Spring Creek
- Flat Creek South
- Ditch Creek
- Cody Creek
- Game Creek
- Upper Hoback River
- Swift Creek
- Upper Gros Ventre River Ranch
- Teal Trace Spring Creek
- Salt River
- Lower Bar BC/ Little Bar BC Creeks
- North Fork Price Spring Creek
- Greys River



Current River Restoration Projects

Lander

- East Fork Tributary Enhancement
- Middle Popo Agie River Restoration
- Little Popo Agie
- Red Canyon Creek

Laramie

- North Platte River RCPP
- East Fork Encampment weir removal
- Encampment River Peryam
- Encampment River Richardson
- Encampment River Oddfellows
- Encampment River Cherokee Wagner Diversions
- Laramie River Holland Property
- North Platte River Ryan Ranch
- Spring Creek Medicine Bow
- Bluegrass Creek
- Muddy Creek

Pinedale

- New Fork River bank
- New Fork River Gas Wells restoration
- Coal Creek Road
- Middle Piney Creek
- South Horse Creek
- Faler Creek

Sheridan

- Tongue River Corridor
- Middle Redwater Creek connectivity
- South Tongue Shutts Flat
- Sheridan Goose creeks 1135
- Goose Creek North Park
- Middle Powder River Kaycee



Quantification Tool

- Wyoming Stream Mitigation Protocol being revised - quantification tool
- **Function-based framework for stream assessment and restoration**
- Functional Pyramid: Hydrology, Hydraulics, Geomorphology, Physicochemical, Biological
- **Existing versus proposed condition**
- Wyoming performance standards (2016 field work)
- **Enhances communication about the possible benefits of restoration.**
- Encourages development of clear, quantifiable objectives that make monitoring obvious!



Level and Category	Parameter	Pre-Restoration Rating	Restoration Potential
1 - Hydrology	Channel-Forming Discharge	N/A	N/A
2 - Hydraulics	Floodplain Connectivity	Functioning-at-Risk	Functioning
3 - Geomorphology	Bed Form Diversity	Functioning-at-Risk	Functioning
	Channel Evolution	Not Functioning	Functioning
	Riparian Vegetation	Not Functioning	Functioning
	Lateral Stability	Functioning-at-Risk	Functioning
4 - Physicochemical	Water Quality	Not Functioning	Functioning-at-Risk
5 - Biology	Macroinvertebrate Communities	Functioning-at-Risk	Functioning-at-Risk
	Fish Communities	Functioning-at-Risk	Functioning-at-Risk

What is restoration?

- Restoring lost functions

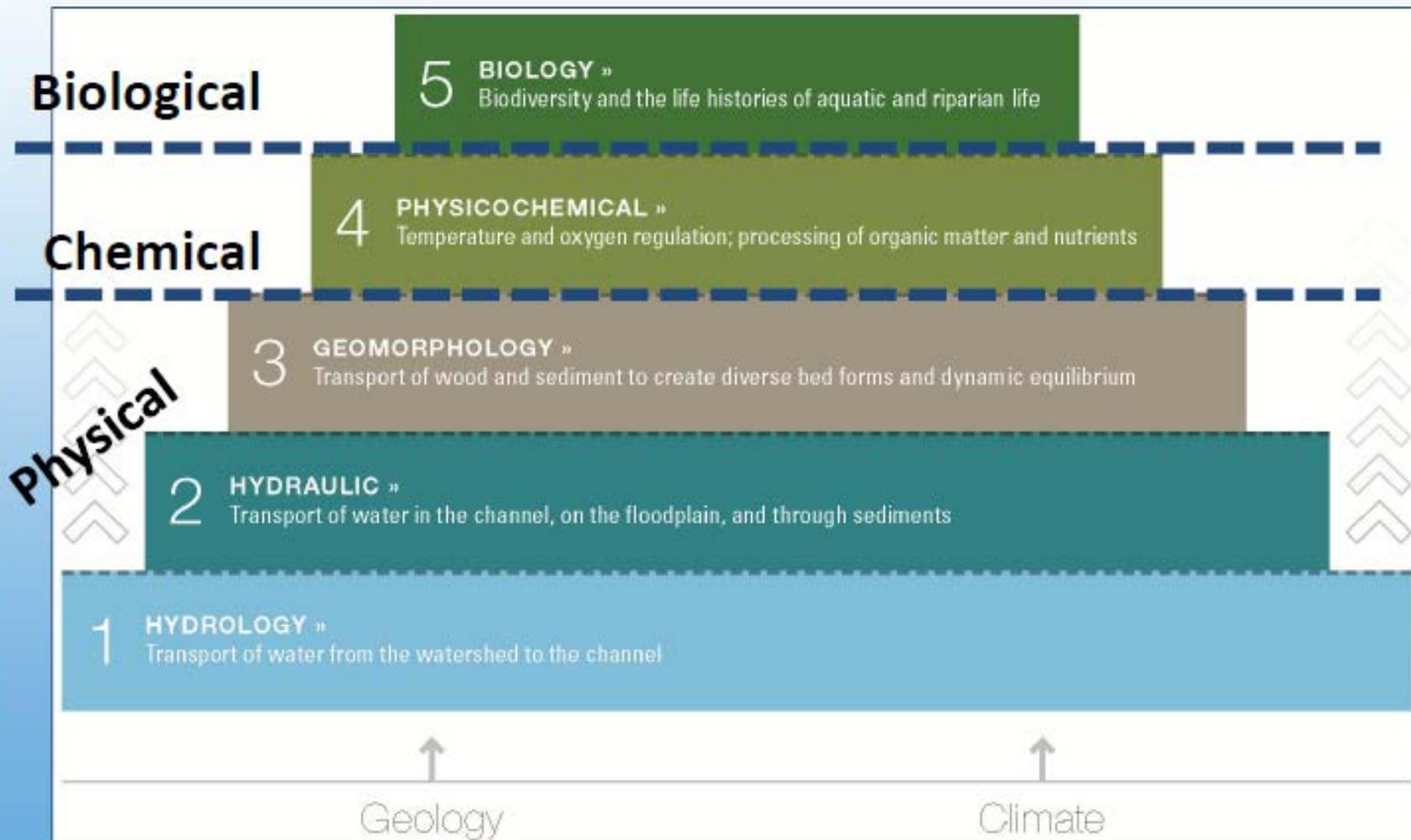


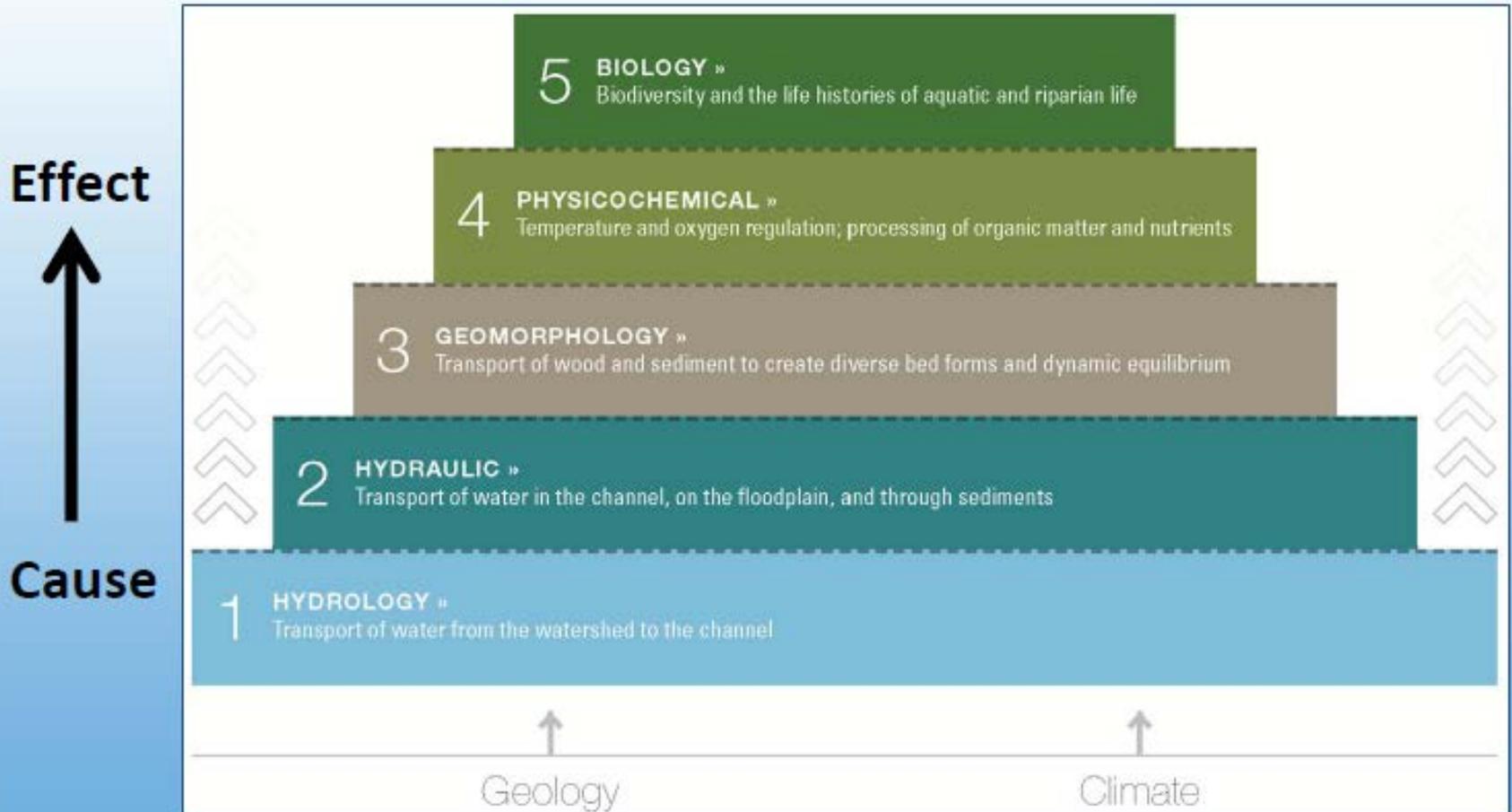
OR

- Restoring to a pre-disturbed condition

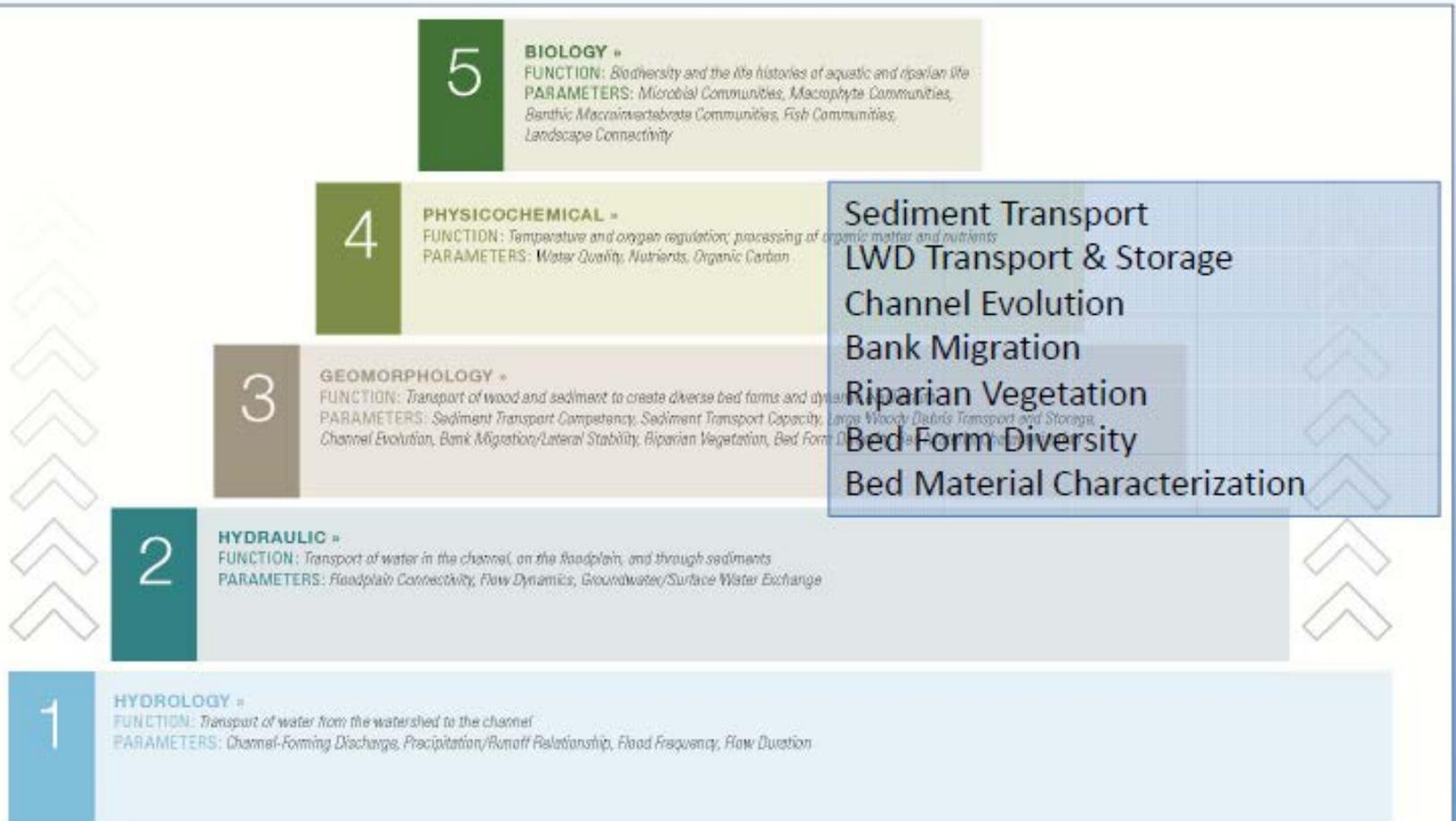


Function - The physical, chemical, and biological processes that occur in ecosystems.





Pyramid and Parameters



Performance Standards

- Based on Functional Capacity
- Divided into three categories:
 - Functioning
 - Functioning-At-Risk
 - Not Functioning
- Similar categories as PFC, different definitions

Key Functional Parameters



Floodplain connectivity



Bed form diversity (good riffles & pools)



Riparian communities



Lateral stability



SUMMARY

- Governors Water Strategy
- **River Restoration projects**
- Functional Pyramid



October 27, 2016 Wyoming Water Association
Annual Meeting, Casper, WY



QUESTIONS ?

