Yampa, White and Green Basin Implementation Plan

Priorities

Project and Methods Study (Use of Modeling)

Considerations(Constraints/Opportunities)

Goals, Processes, Measurable Outcomes

Goals for Tonight

- Vet the Basin Implementation Plan
- Answer Questions and Concerns
- Highlight Major Concerns
- Determine Next Steps/Next Step Options
  - Approve or not
  - Approve with revised specific language
  - Approve with list of conditions/language
  - Approval and timeline considerations
- Timeline for Actions

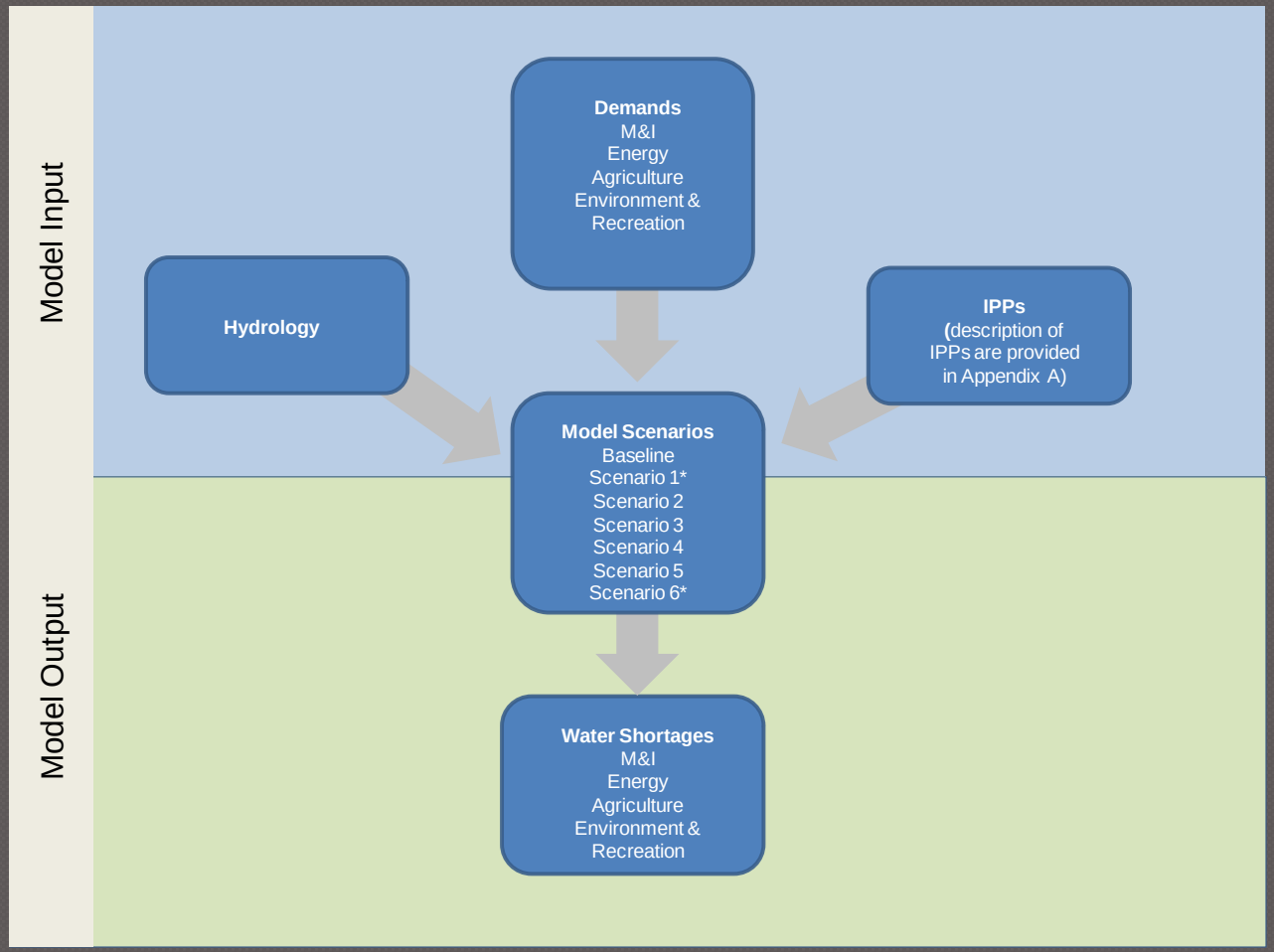
Primary Roundtable Priority

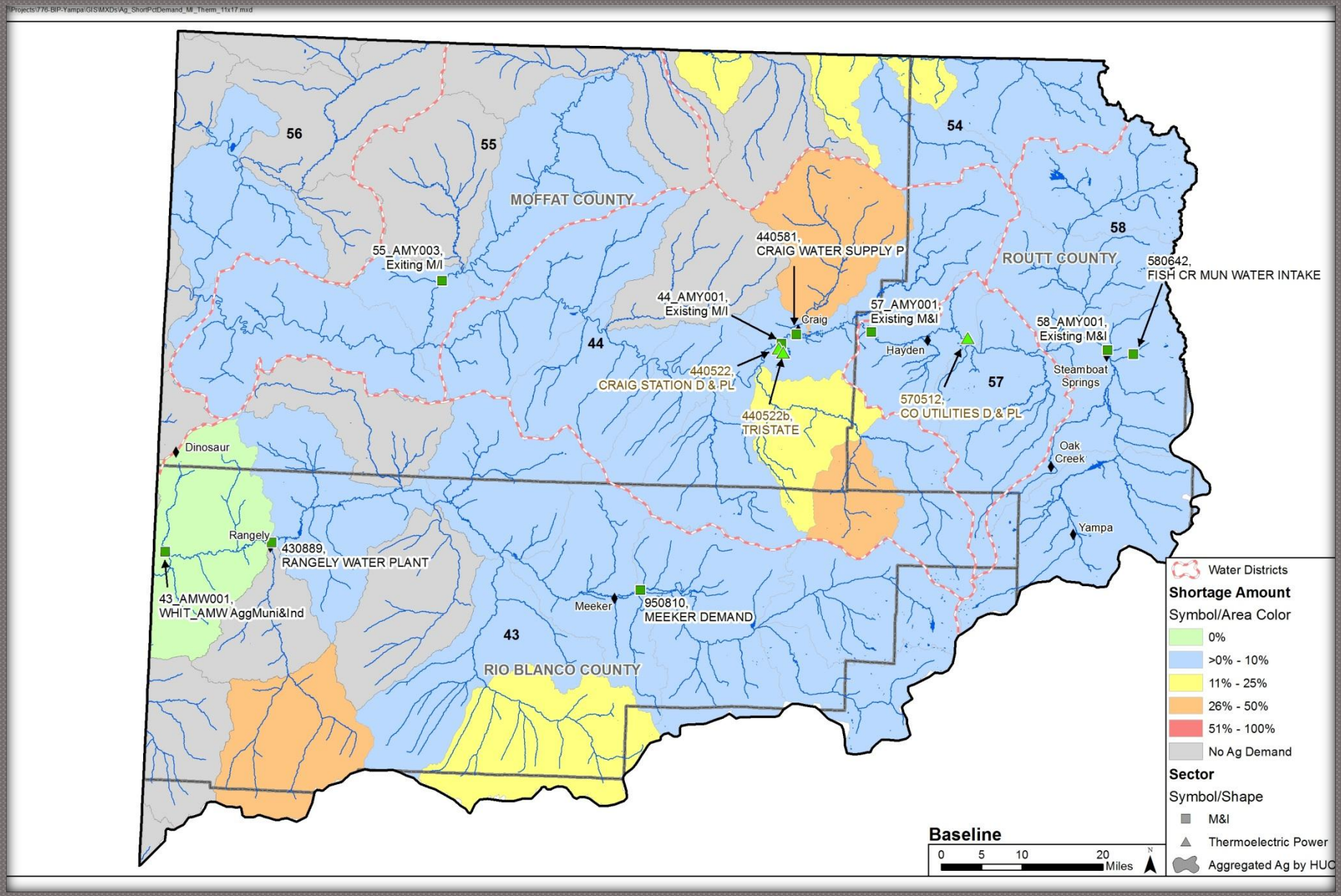
- Protect the Basin from curtailment in all circumstances for existing decreed, in-basin absolute water rights/uses, and achieve an equitable apportionment of native flows, over and above existing uses, for anticipated and unanticipated future water uses in the Yampa-White-Green Basin
- The principal objective underlying all goals is the maintenance and protection of historical water use in the Basin as well as the protection of water supplies for future in-basin demands

P&M Modeling: A System for Understanding Considerations, Achieving Priorities and Goals

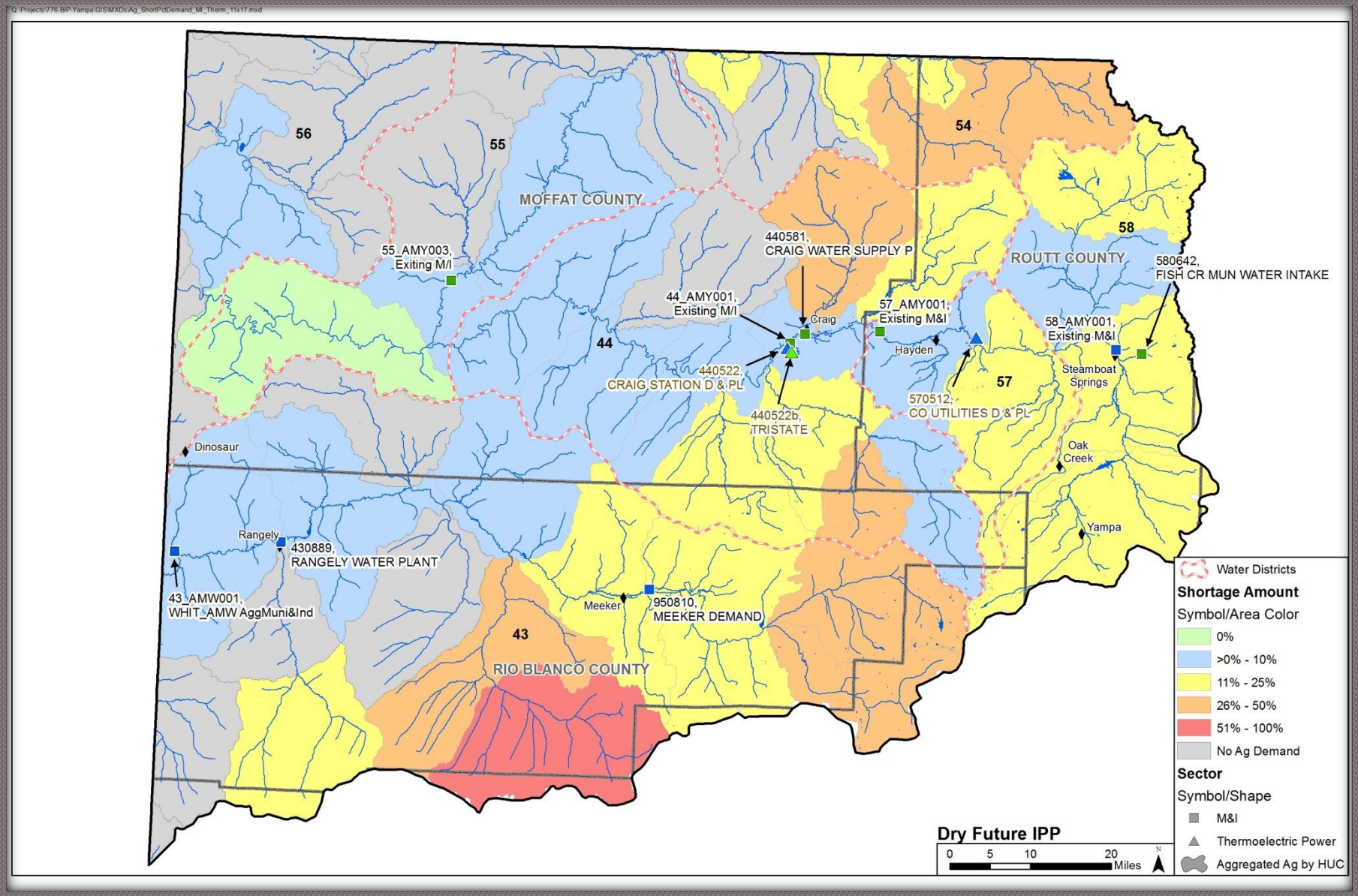
- Developed a comprehensive modeling and spatial analysis tool to understand situation and tradeoffs.
- Important for determining:
  - Constraints and opportunities (considerations)
  - Processes and measurable outcomes
  - Local interests and concerns
- P&M process helps the Basin get ahead
- Outcome is proactive verses reactive process for use in the face of change

Projects and Methods Study

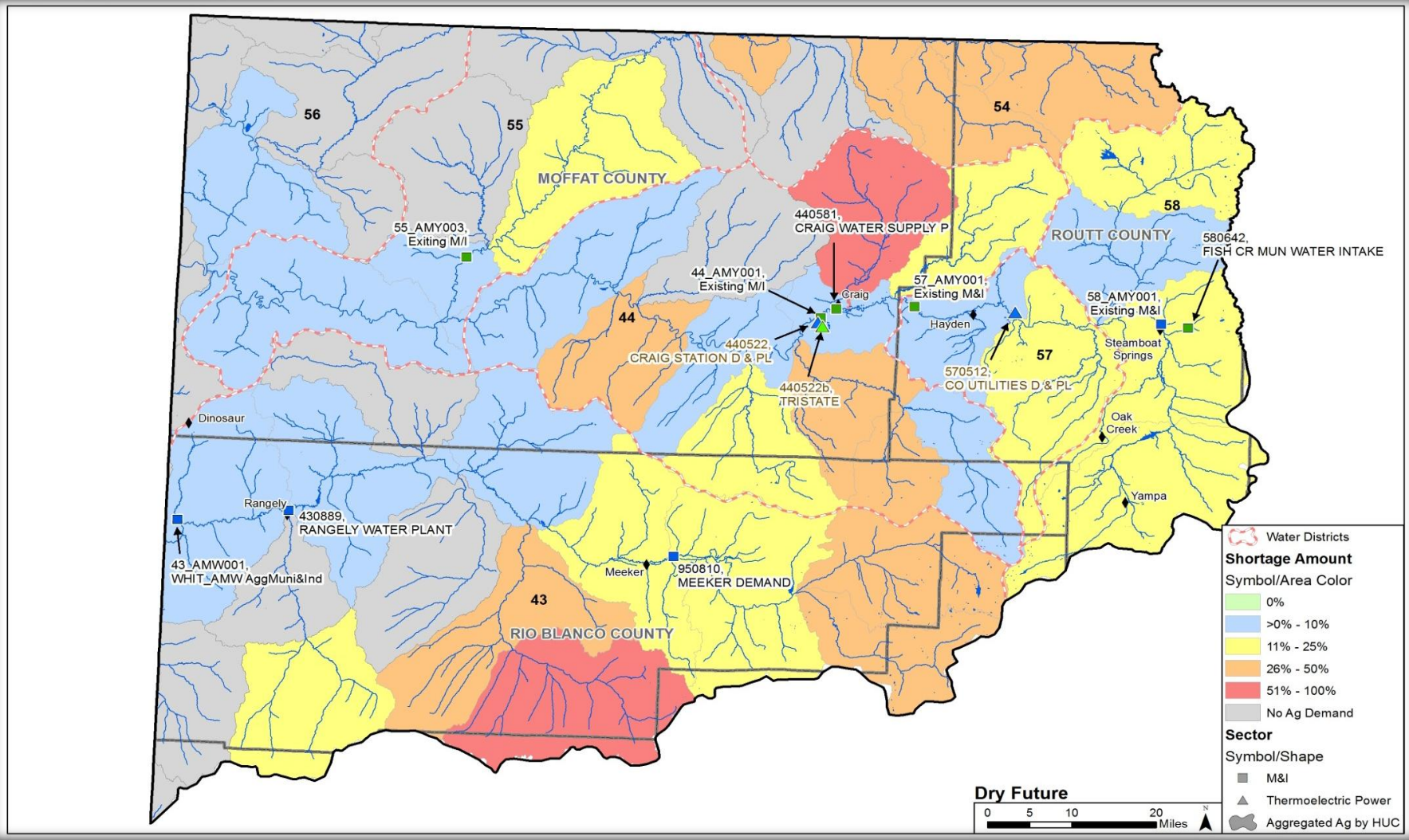




Example Shortage Indicator Baseline Shortage Amount



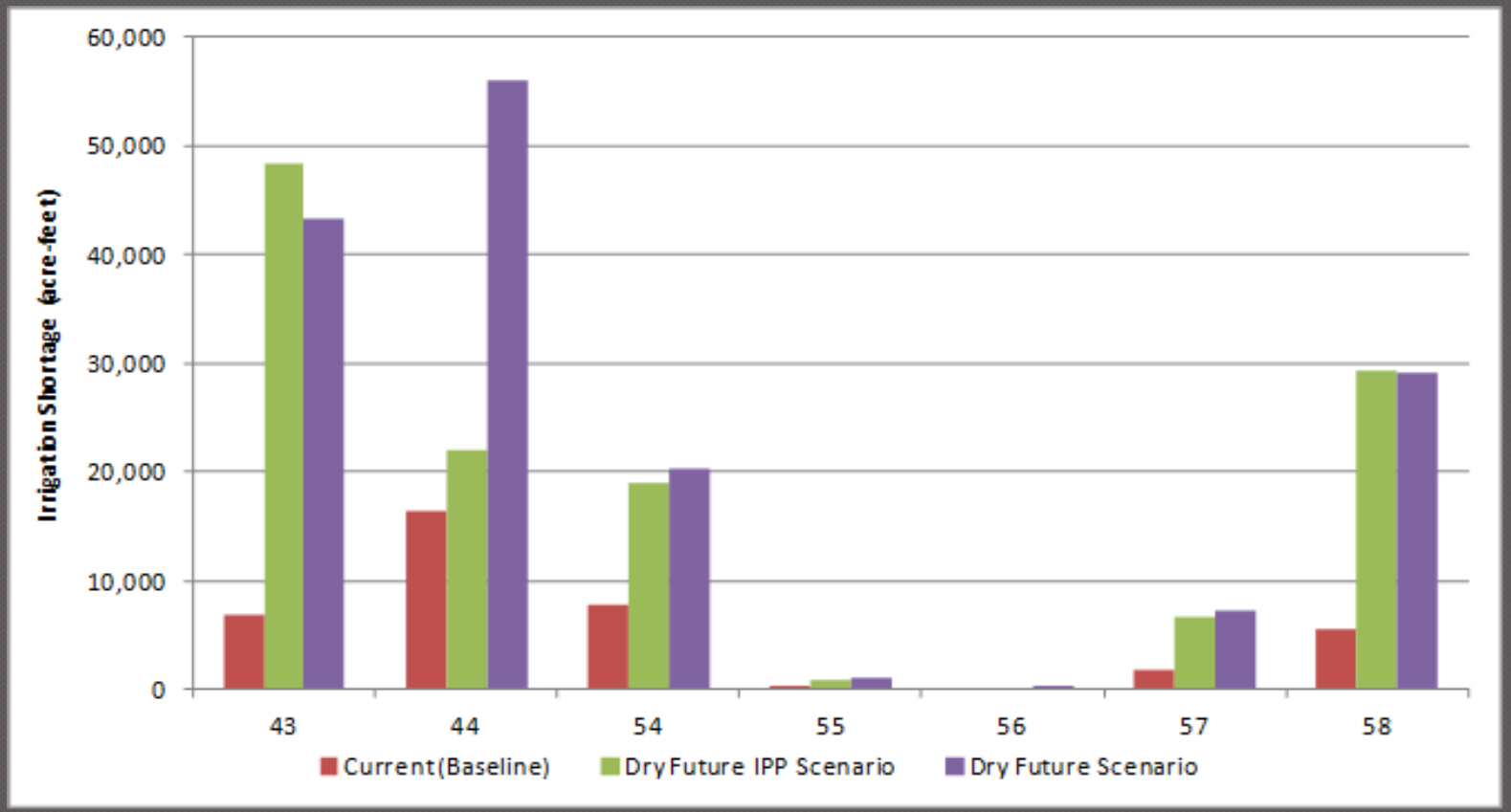
Example Shortage Indicator Dry Future IPP

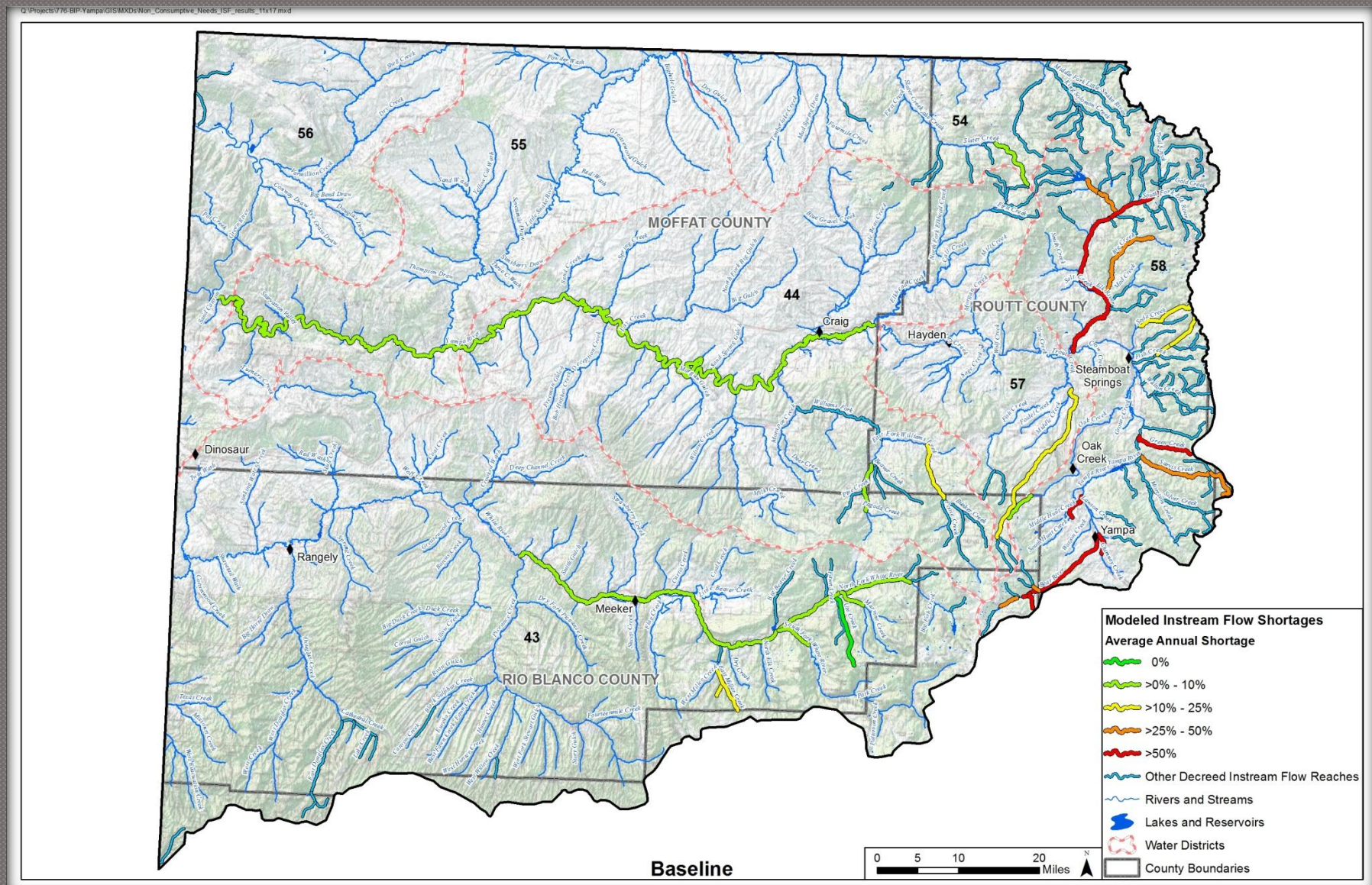


Example Shortage Indicator Dry Future

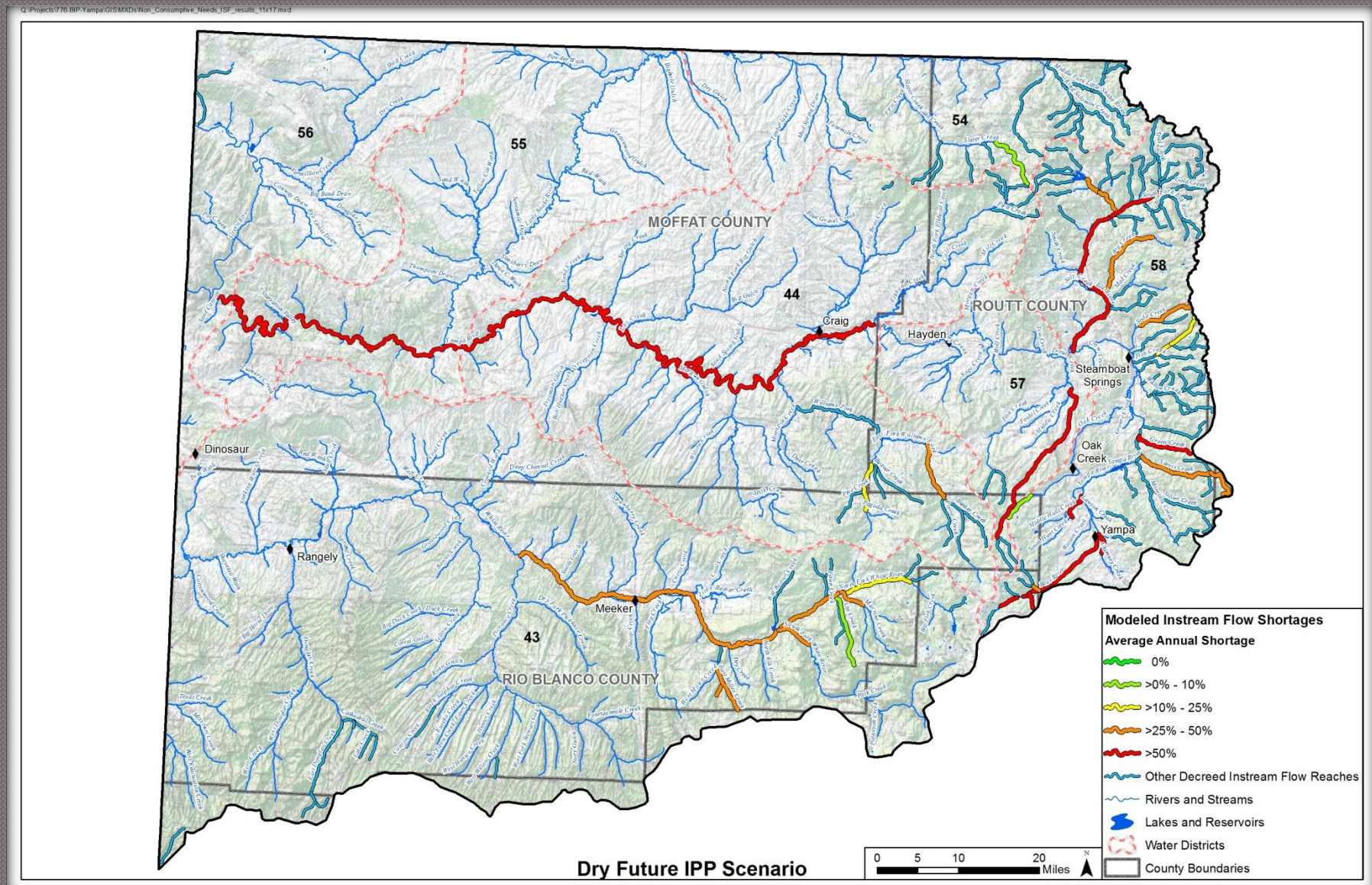
Example Model Output

Irrigation Shortage in each District

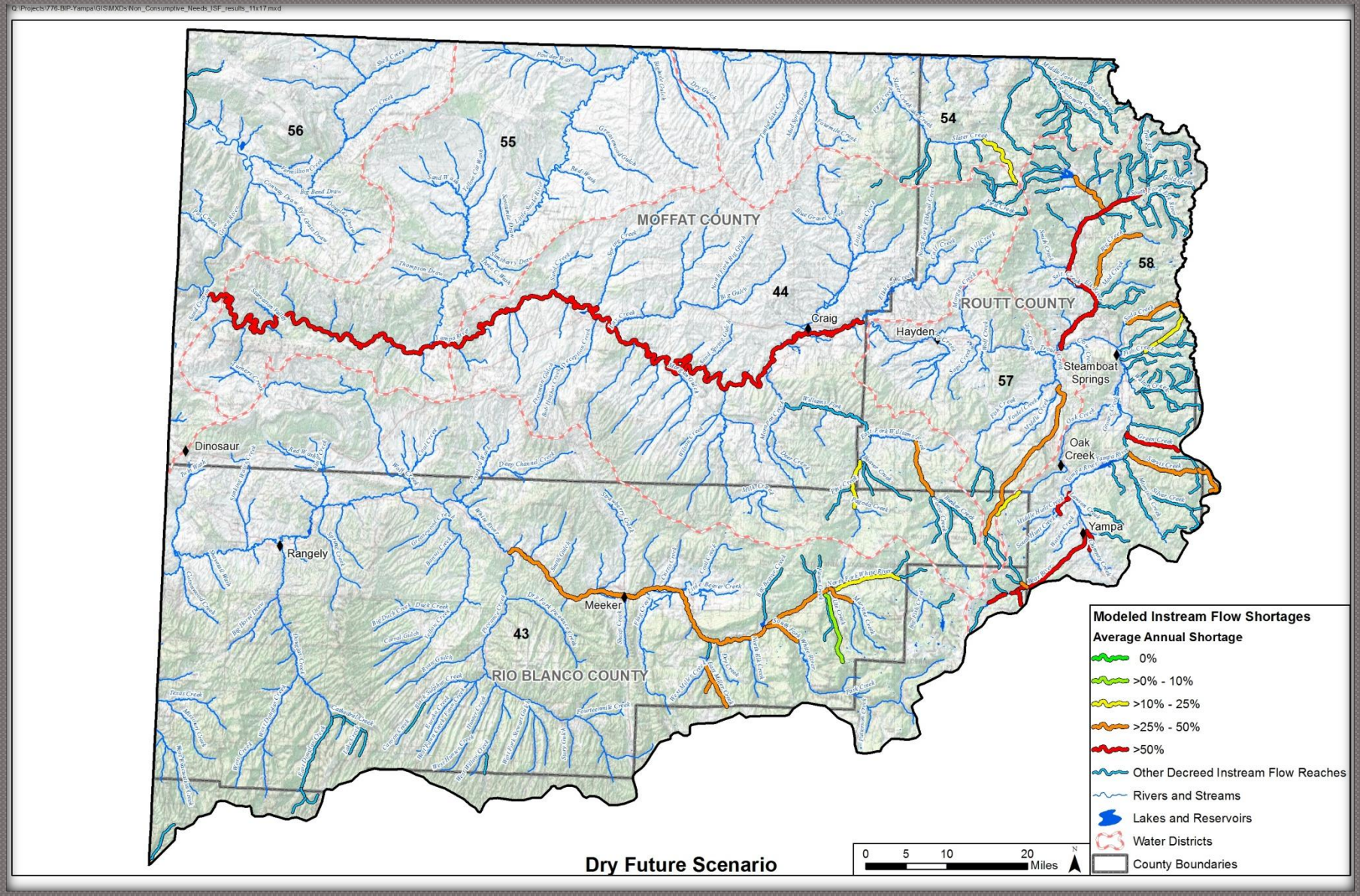




Example Baseline Annual Shortage



Example Dry Future IPP Annual Shortage



Example Dry Future Annual Shortage

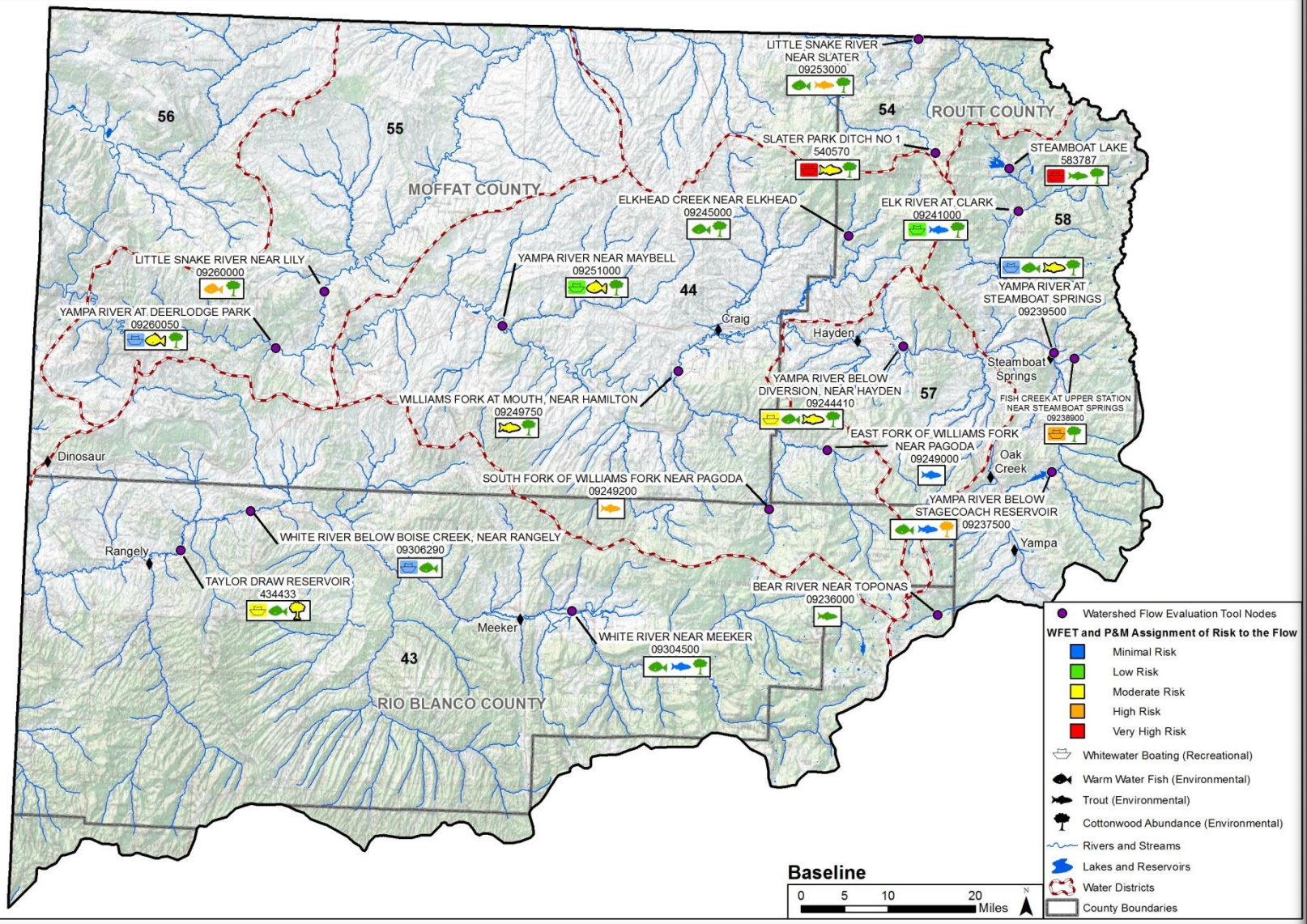
Node	Name of Model Node	Instream Modeled Flow Target (cfs)	Annual Average Flow (cfs)			Annual Average Short (cfs)			Percentage Shortage (%)		
			Baseline	Dry Future IPP Scenario	Dry Future Scenario	Baseline	Dry Future IPP Scenario	Dry Future Scenario	Baseline	Dry Future IPP Scenario	Dry Future Scenario
582404	Bear River (Middle)	7.9	4.1	2.9	2.9	3.8	5.0	5.1	47.8%	63.5%	63.7%
582202	Bear River (Lower)	12.0	5.8	3.3	3.3	6.2	8.7	8.7	51.6%	72.5%	72.9%
582206	Big Creek	15.0	10.7	8.8	8.8	4.3	6.2	6.2	28.4%	41.6%	41.6%
582214	Coal Creek	5.0	3.4	2.8	2.8	1.6	2.2	2.2	32.1%	44.2%	44.2%
582216	Dome Creek	2.0	0.3	0.4	0.4	1.7	1.6	1.6	85.9%	81.0%	81.0%
441452	East Fork Williams Fork	14.2	12.3	8.7	8.7	1.9	5.5	5.5	13.5%	38.7%	38.9%
581355	Elk River (Lower)	65.0	26.9	24.5	24.4	38.1	40.5	40.6	58.6%	62.4%	62.5%
582219	Elk River (Upper)	65.0	27.3	26.0	25.8	37.7	39.1	39.2	58.1%	60.1%	60.4%
582245	Green Creek	5.0	2.1	2.1	2.1	2.9	2.9	2.9	58.3%	58.9%	59.0%
582519	Hunt Creek	5.0	2.4	1.8	1.8	2.6	3.2	3.2	52.2%	63.2%	63.6%
432334	Marvine Creek	40.0	39.0	27.4	27.3	1.0	12.6	12.7	2.5%	31.4%	31.7%
432337	Miller Creek	10.0	8.4	7.1	7.1	1.6	2.9	2.9	16.1%	28.9%	28.9%
582287	North Fork Fish Creek	5.0	4.3	4.2	4.2	0.7	0.8	0.8	15.0%	15.8%	15.8%
432339	North Fork White River	70.0	69.7	52.9	52.9	0.3	17.1	17.1	0.4%	24.4%	24.4%
432338	North Fork White River	120.0	117.5	84.0	84.0	2.5	36.0	36.0	2.1%	30.0%	30.0%
582290	Oak Creek	2.0	1.9	1.8	1.8	0.1	0.2	0.2	7.0%	8.9%	10.3%
582409	Phillips Creek	6.0	2.4	1.4	1.3	3.6	4.6	4.7	59.9%	77.5%	77.5%
582306	Service Creek	6.0	3.9	3.6	3.6	2.1	2.4	2.4	34.2%	40.6%	40.6%
542076	Slater Creek	3.0	2.9	2.8	2.6	0.1	0.2	0.4	3.4%	8.2%	11.8%
582311	Soda Creek	5.0	4.1	3.2	3.2	0.9	1.8	1.8	17.4%	36.7%	36.7%
432344	South Fork White River	80.0	74.8	47.1	47.0	5.2	32.9	33.0	6.5%	41.1%	41.2%
441456	South Fork Williams Fork	5.9	5.4	4.8	4.7	0.5	1.1	1.1	8.6%	19.1%	19.5%
571009	Trout Creek (Lower)	5.0	3.8	1.6	2.9	1.2	3.4	2.1	24.7%	68.7%	41.7%
432372	Ute Creek	6.0	6.0	5.7	5.7	0.0	0.3	0.3	0.0%	4.9%	5.0%
431845	White River	200.0	190.8	111.9	113.6	9.2	88.1	86.4	4.6%	44.1%	43.2%
441448	Williams Fork River	20.7	20.3	15.8	16.2	0.4	4.9	4.5	1.7%	23.8%	21.9%
582332	Willow Creek	7.0	4.0	3.8	3.8	3.0	3.2	3.2	42.2%	46.1%	45.7%
581461	Willow Creek	5.0	3.0	2.8	2.9	2.0	2.2	2.1	40.7%	43.3%	42.8%
582162	Willow Spring & Pond	13.0	8.7	7.5	7.2	4.3	5.6	5.8	33.0%	42.7%	44.5%
582164	Yampa River	56.9	53.1	44.7	44.8	3.8	12.2	12.2	6.6%	21.4%	21.4%

Modeled Annual Average Instream Flow Reaches

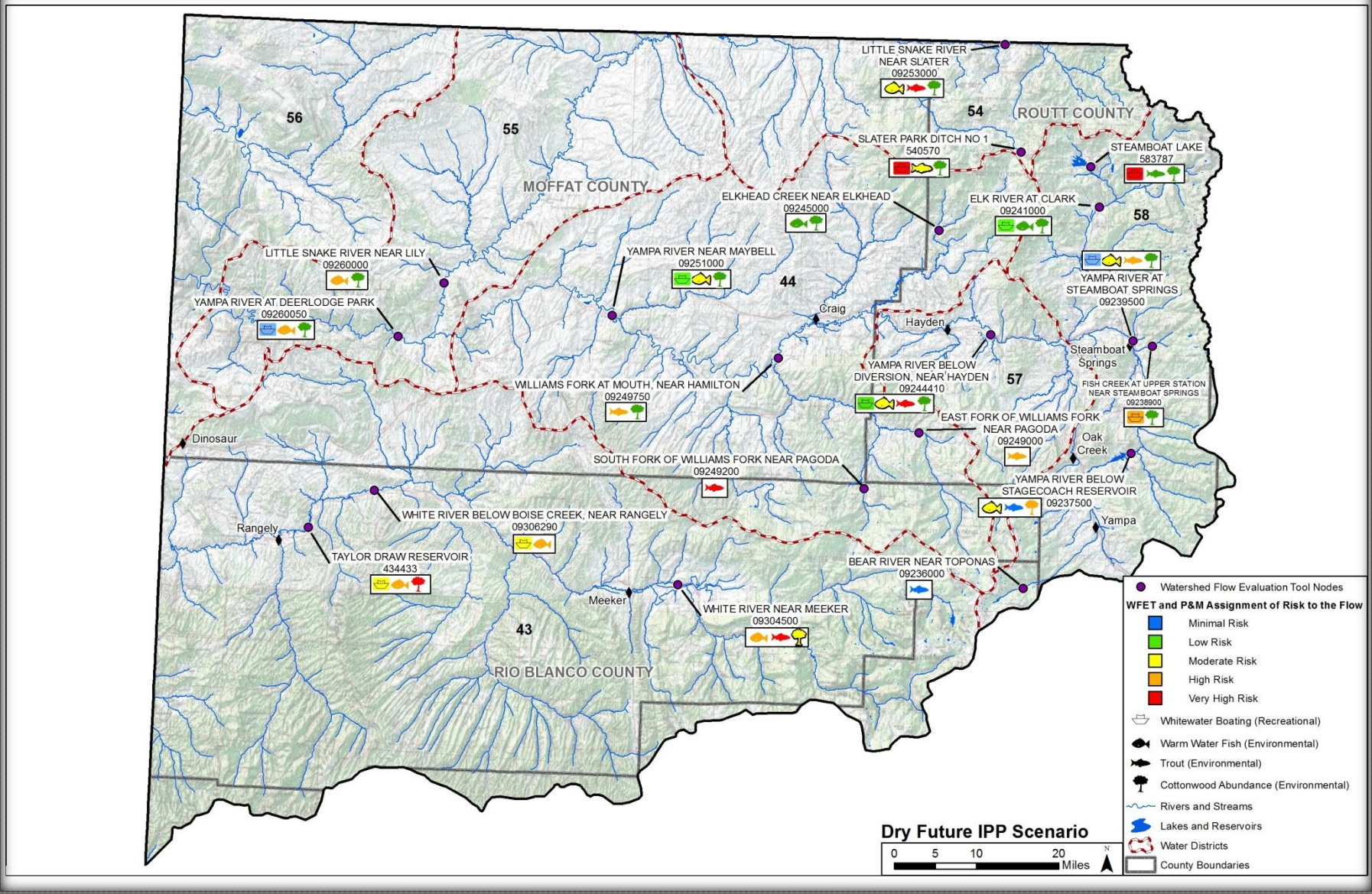
Example of Risk Element Analysis

- Constraints on water development and water management to protect habitat for endangered species are in place in the Green and Yampa basins, and similar constraints are being contemplated for the White River Basin
- The BIP addresses how the Basin's water needs must be developed in ways that provide collaborative solutions to water supply challenges while maintaining a balanced and diverse economic base long into the future
- Existing flow protections for endangered species must be considered in this process

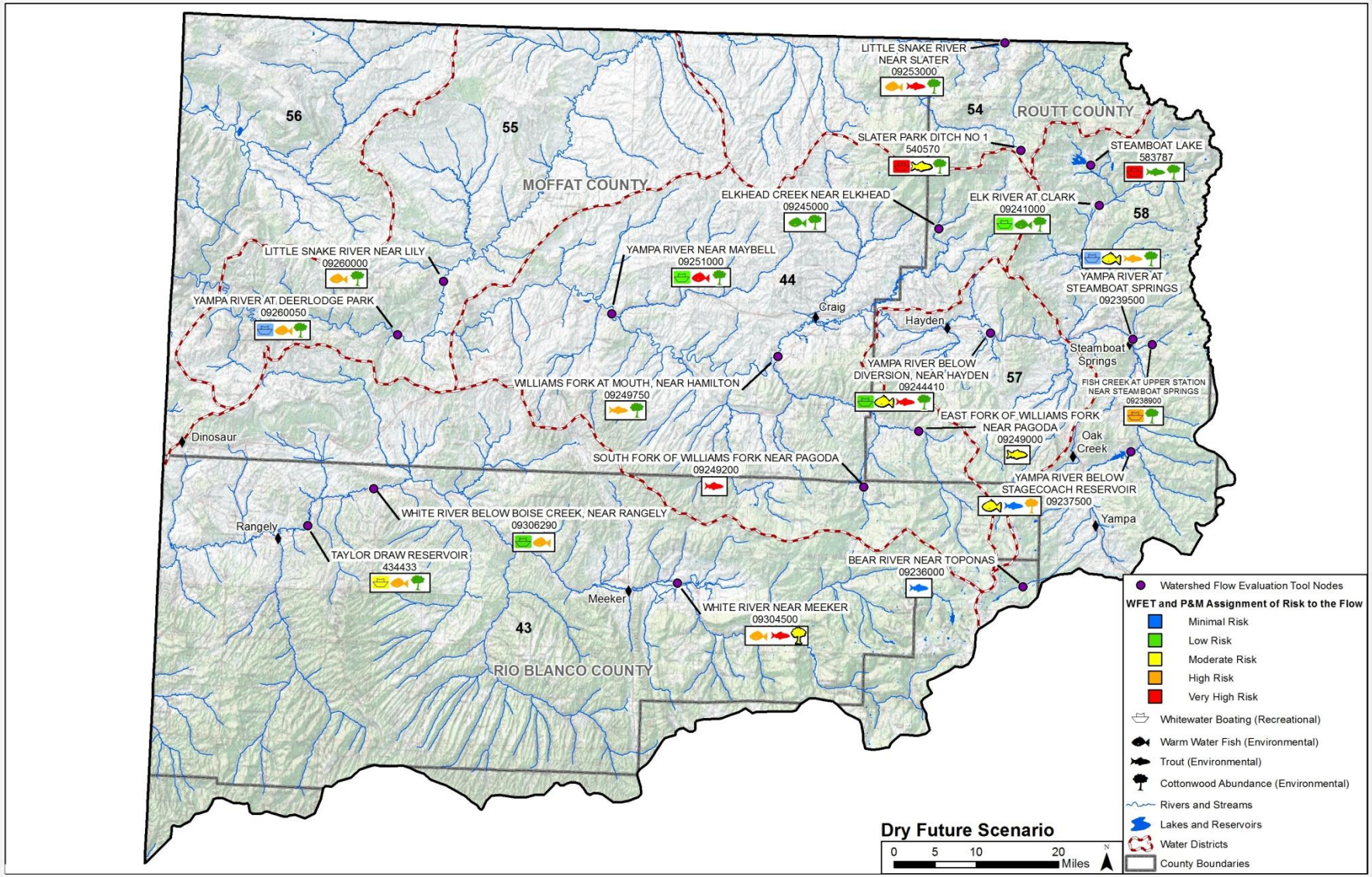
	Reach Name	Model Node	Trout Flow Risk (Aug and Sept)		
			Baseline	Dry Future IPP Scenario	Dry Future Scenario
			Existing Demand Historical	High Demand Dry (with IPPs)	High Demand Dry (no IPPs)
2	Yampa River from Pump Station to confluence of Elkhead Creek	9244410	Moderate Risk	Very High Risk	Very High Risk
4	Elk River from headwaters to the County Road 129 bridge at Clark; including the North, Middle and South Fork as well as the mainstem of the Elk	9241000	Minimal Risk	Moderate Risk	Moderate Risk
5	White River from headwaters to Meeker; including the North and South Fork and mainstem of the White	9304500	Minimal Risk	Very High Risk	Very High Risk
8	Slater Creek from headwaters to the Beaver Creek confluence	540570	Moderate Risk	Moderate Risk	Moderate Risk
10	South Fork of the Little Snake from headwaters to confluence of Johnson Creek	9253000	High Risk	Very High Risk	Very High Risk
11a	East Fork of the Williams Fork from headwaters to the confluence of the Forks	9249000	Minimal Risk	High Risk	Moderate Risk
11b	South Fork of the Williams Fork from headwaters to the confluence of the Forks	9249200	High Risk	Very High Risk	Very High Risk
11c	Williams Fork - from South Fork to confluence of the Yampa River	9249750	Moderate Risk	High Risk	High Risk
14	Yampa River from Stagecoach Reservoir "Tailwaters" to northern boundary of Sarvis Creek State Wildlife area	9237500	Minimal Risk	Minimal Risk	Minimal Risk
16	Yampa River from Chuck Lewis Wildlife Area to Pump Station	9239500	Moderate Risk	High Risk	High Risk
18	Willow Creek below Steamboat Lake to confluence with the Elk	583787	Low Risk	Low Risk	Low Risk
19	Bear River from headwaters to USFS boundary	9236000	Low Risk	Minimal Risk	Minimal Risk



Example Baseline Environmental/Recreational Attributes



Example Dry Future IPP Environmental/Recreational Attributes



Example Dry Future Environmental/Recreational Attributes

Considerations
Handling the Constraints and Opportunities

- The YWG Roundtable recognizes that almost any water supply whether categorized as an Identified Project and Process (IPP) or not, will involve complex and nuanced tradeoffs
- Each project will present its own specific set of opportunities and constraints
- What is a constraint for one project might be an opportunity for another
- Consequently, at this time, the YWG Roundtable believes it is not possible to develop a comprehensive list of opportunities and constraints
- Rather the Plan sets out planning "considerations" that will serve to guide future development and evaluation of water supply and resource projects

Key Considerations

Summary of Considerations for the Yampa/White/Green Basin
Less developed relative to other basins in the State
Relatively junior water rights relative to other basins in the State
Limited storage
Less developed diversion infrastructure
No history of mainstem administration
Numerous large conditional water rights
Flow requirements for endangered species protection ▪ Yampa PBO ○ Increase in irrigated lands ○ Increase in agricultural consumptive use ▪ Green River PBO ▪ Prospective White River PBO

Goals, Processes and Measurable Outcomes

Protect existing decreed and anticipated future water uses in the Yampa-White-Green Basin

Processes:

- Document existing baseline of major decrees, environmental agreements (PBOs), H2O rights admin, including permitted future depletions
- Detail the projected effects of water shortages (drought/climate change) that may require additional water storage to satisfy existing/future uses
- Review Division 6 water rights abandonment list and educate pre-compact water rights owners on how to maintain existing decreed water rights
- Update/refine estimates of anticipated/unanticipated future water uses

Measurable Outcomes:

- Obtain equitable apportionment of native flow of Yampa/White Rivers for existing/future in-basin H2O uses within Y-W-G basin via a legally assured process prior to development of any new TMD
- Maintain existing/future PBO depletion allowances for in-basin needs
- Minimize and mitigate the risk of a Colorado River compact shortage
- Prevent pre-Compact H2O rights from abandonment/placement on the abandonment list

Protect/encourage AG uses of H2O in the Y/W/G Basin in context of private property rights

Processes:

- Identify agricultural water shortages and evaluate potential cooperative and/or incentive programs to reduce agricultural water shortages
- Identify projects that propose to use at-risk water rights, alternative transfer methods, water banking and efficiency improvements that protect and encourage continued agricultural water use
- Identify projects that will bring new irrigable lands in the basin into production using new water diversions
- Encourage and support M&I projects that have components that preserve agricultural water uses

Measurable Outcomes:

- Preserve the current baseline of approximately 119,000 protected acres and expand by 10% by 2030
- Encourage land use policies and community goals that enhance agriculture and agricultural water rights

Improve AG supplies to increase irrigated land/reduce shortages/meet potential new Ag needs adding 14,000 acres

Processes:

- Identify specific locations in the Y-W-G Basin where agricultural shortages exist and quantify shortage time/frequency/duration
- Consider potential effects of climate change, drought and compact shortages in shortage analysis
- Identify projects that will bring new irrigable lands in the basin into production using new water diversions
- Recommend site-specific solutions in collaboration with local water users.
- Evaluate multiple objectives of recommended solutions
- Develop methods to streamline permitting in a cost-effective manner

Measurable Outcomes:

- Reduce agricultural shortages basin-wide by 10 percent by the year 2030
- Preserve the current baseline of 119,000 irrigated acres and expand by at least 14,000 acres

Identify and address municipal and industrial water shortages

Processes:

- Identify specific locations where municipal/industrial shortages may exist in drought scenarios; quantify shortage time/frequency/duration
- Identify regional impacts of water shortages (drought, climate change, wildfire, compact issues) on municipal and industrial demands
- Identify projects and processes that can be used to meet M&I needs
- Encourage collaborative multi-use storage projects
- Support efforts of water providers to secure redundant supplies in the face of potential watershed impacts from wildfire
- Encourage municipal entities to meet some future municipal water needs through water conservation and efficiency

Measurable Outcomes:

- Reliably meet 100% of municipal and industrial demands in the basin through the year 2050 and beyond

Quantify-protect environmental-recreational water uses at locations-nodes identified in the non-consumptive needs study of Y/W/G Roundtable

Processes:

- Identify specific locations in Y-W-G Basins where identified non-consumptive needs are not being met. Use tools, such as Watershed Flow Evaluation, to quantify flow needs in time/frequency/duration at nodes identified in P&M study
- Recommend potential site-specific solutions/projects in collaboration with local water users
- Perform analyses to maximize the effectiveness of recommended solutions for meeting multiple objectives (i.e. consumptive/non-consumptive)
- Recognize that floodplains, riparian areas, and wetlands are natural storage reservoirs, implement restoration projects to maintain/ improve

Measurable Outcomes:

- To the extent that non-consumptive needs can be specified and projects can be analyzed, implement projects for non-consumptive attributes within existing legal/water management context
- Multi-purpose projects and methods will be researched and designed to meet the other goals enumerated for Yampa PBO, new White PBO, flow protection and any water leasing or re-operation of projects needed for native warm water fish, for cottonwoods, and for recreational boating on reaches with greater and overlapping flow alteration risks
- Quantify non-consumptive attributes for environmental attributes and recreation, the economic values of the relatively natural flow regimes of the Yampa/ White, and as applicable the modified Green river systems

Maintain and consider the existing natural range of water quality that is necessary for current and anticipated water uses.

Processes:

- Encourage and support water quality protection and monitoring programs in the sub-basins of the Y-W-G. through watershed groups and other efforts

Measurable Outcomes:

- Consider and maintain the existing water quality necessary for current and future water uses when reviewing IPPs.
- Support the Implementation of water quality monitoring programs to create quality-controlled baseline data for all sub-basins of the Y-W-G.

Restore, maintain, and modernize water storage and distribution infrastructure

Processes:

- Identify opportunities/constraints for Ag water efficiency that do not cause injury to other water users or environmental values
- Identity specific locations where infrastructure requires improvement or replacement to preserve existing uses
- Recommend potential solutions in collaboration with local water users
- Research potential grant programs for infrastructure improvements
- Identify/include collective partnerships for infrastructure improvements which may provide multi-use benefit, i.e. fish passage
- Evaluate appropriate measuring infrastructure for improved admin of the rivers
- Conduct a headgate study in Y-W-G basins which describes efficiency-effectiveness of existing structures and accessibility to diversion point, and use

Measurable Outcomes:

- Increased percentage of operable headgates
- As applicable reduce water loss through less wastage/seepage through leaky ditches/headgates/storage ponds
- Increase Ag H2O storage combined with multi-benefit opportunities as possible
- Implement at least one project every year in the Yampa-White-Green Basin focusing on the restoration, maintenance, and modernization of existing water infrastructure

Develop an integrated system of H2O use/storage/administration/delivery to reduce shortages-meet environmental/recreational needs

Processes:

- Use appropriate CDSS modeling to evaluate storage operation/delivery locations/river flows
- Evaluate contracting possibilities with existing/proposed storage options
- Discuss river administration opportunities
- Review needs for infrastructure improvements
- Encourage cooperative partnerships

Measurable Outcomes:

- Success in permitting and constructing in-basin storage projects
- Reduction in consumptive shortages in drought scenarios
- Reduction in identified non-consumptive shortages in drought scenarios
- Admin/infrastructure improvements making decreed amounts of water available to diversion structures reducing need for seasonal gravel dams in the river
- Reduce the potential incidence of severe low flows in order for water users to exercise their water rights

Public Comments

Commenter Name/Org.	Date Received	Comment
Anthony D'Aquila	3/12/2014	Proposed 4 goals, including 1) No new inter-basin transfers or withdrawals from YWG Basin unless all reasonable alternatives have been implemented; 2) CO Legislature to establish and approve mandatory daily water consumption goals for public and otherwise regulated water utility in the state; 3) CO state and federal legislators represent these goals; and 4) Water policy planning in the YWG Basin and preferably state-wide must consider full spectrum of environmental, social, and economic impacts and benefits.
Ben Beall, Yampa River System Legacy Partnership/America's Great Outdoors	3/14/2014	Identified principles for future water needs planning in the Yampa Basin, including protecting current and future flows, preserving agricultural lands, protecting native riparian habitat, protecting four endangered fish, and ensuring existing and future recreational opportunities.
Kevin McBride, Upper Yampa Water Conservancy District	4/10/2014	Letter from John V. Redmond approving process of the Upper Yampa Water Conservancy District, Yampa-White-Green Basin Roundtable's White Paper. Identifies need for equitable apportionment, opposes additional Trans-Mountain Diversions from CO River Basin

Public Comments (cont.)

Commenter Name/Org.	Date Received	Comment
Stephanie Scott, CO Trout Unlimited	5/2/2014	Proposed guiding principles: 1) The Colorado Water Plan must include meaningful efforts to protect and restore healthy rivers and streams and environmental and recreation uses of water, 2) Basin implementation plans need to help refine the municipal supply "gap" at a local level, 3) Filling the municipal water supply gap requires a balanced strategy emphasizing efficient use of Colorado's limited water supplies, and 4) Laws and policies to facilitate creative water management should be encouraged.
Marsha Daughenbaugh, Community Agriculture Alliance	6/18/2014	Agricultural water rights in Northwest Colorado should be protected and enhanced by the CWP. Existing agricultural water rights, both pre-Colorado River and post Compact water rights, must be protected. Agriculture should be valued equally across CO. Important issues include protection of ag. water rights, equitable apportionment, trans-mountain diversions that don't threaten West Slope water rights, water conservation, non-consumptive benefits, relationship b/t water quality and quantity, future M&I needs, and protection of wildlife/riparian habitat.

Public Comments (cont.)

Commenter Name/Org.	Date Received	Comment
Thomas Korver on behalf of John Adams	7/21/2014	Finds that Morrison Creek Reservoir is inconsistent with goals of preserving agriculture and agricultural water use and no demonstrable need for the project has been established. Need for Reservoir should be fully demonstrated, and impacts of Reservoir should be fully addressed, before there is any further consideration of the Reservoir as an IPP. Unless such additional analysis is undertaken, Morrison Creek Reservoir should be removed from the IPP list.
Dequine family, Germaine family, and Kim Singleton	7/21/2014	Open to the idea of the project on the condition that it operates and functions in a manner that is reasonable, respectful, sustainable, and aesthetic. Need to minimize draw down. Approve non-motorized recreational use, minimal traffic impacts, and private shoreline. Support the Morrison Creek Reservoir project – but only with the inclusion of the aforementioned matters.
Richard Saterdal, Morrison Divide Ranch HOA	7/21/2014	Morrison Creek Reservoir is not included in several analysis tables and figures. YWG BIP results need to show what benefits each IPP provides in each scenario to determine effectiveness of individual projects. BIP also needs to describe important operational assumptions for the projects, such as whether or not MC Reservoir was modeled to protect instream flows. Based on info provided in the draft YWG BIP it is impossible to tell whether or not the proposed Morrison Creek Reservoir provides any benefits in the scenarios modeled.

Next Steps

- Identify inconsistencies in P&M study
- Refine, explain, resolve inconsistencies
- Further define IPP's and establish work plan for accomplishing measurable outcomes
- Expand understanding of, and improve use of, P&M Process
- Complete measurable outcomes

Questions