Tackling uncertainty: Coupling Stakeholder and Biophysical Scenarios under a multifaceted research program

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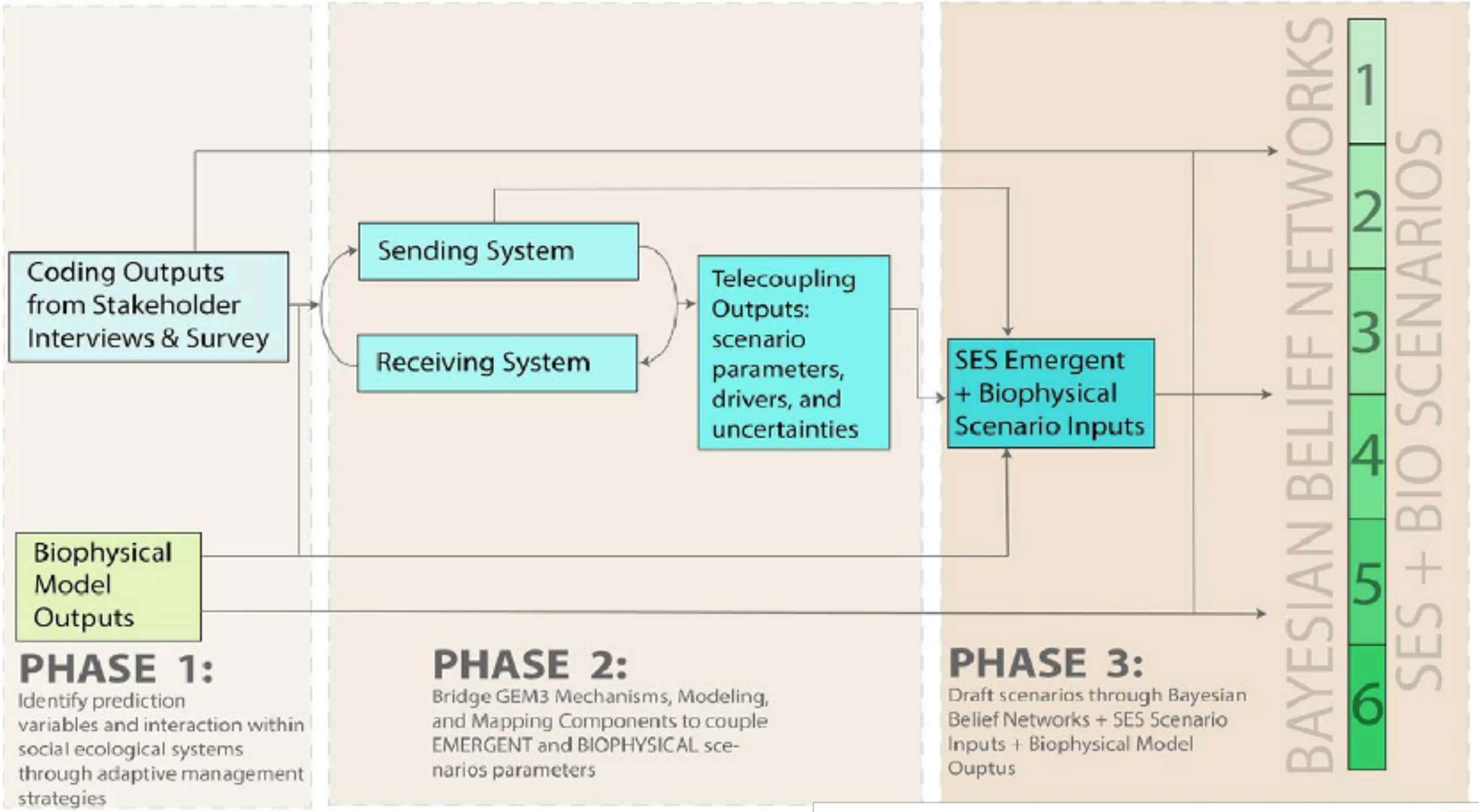
IDAHO EPSCoR

GEM3 Genes by Environment Modeling · Mechanisms · Mapping

BOISE STATE UNIVERSITY

University of Idaho

Idaho State University



PROCESS

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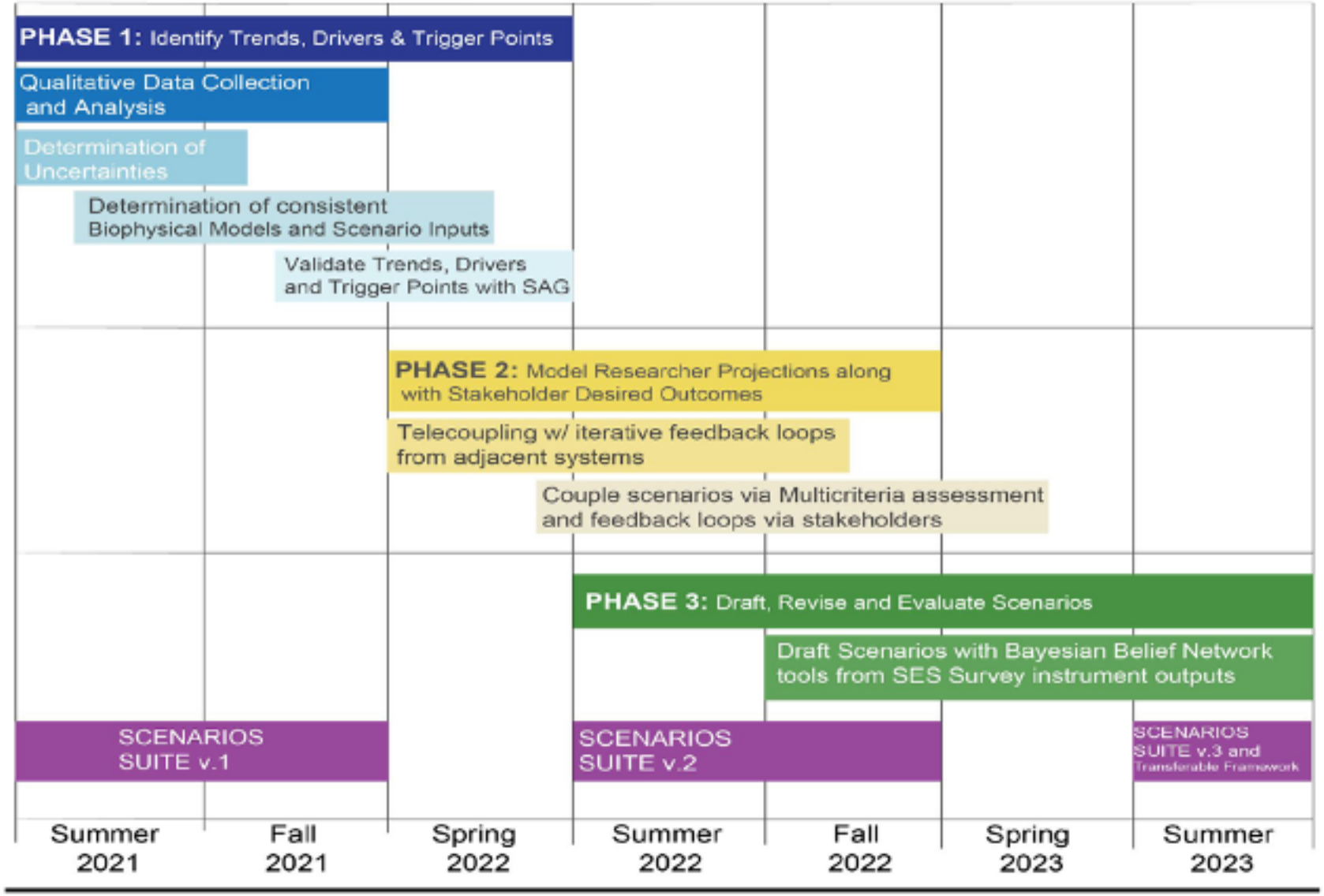
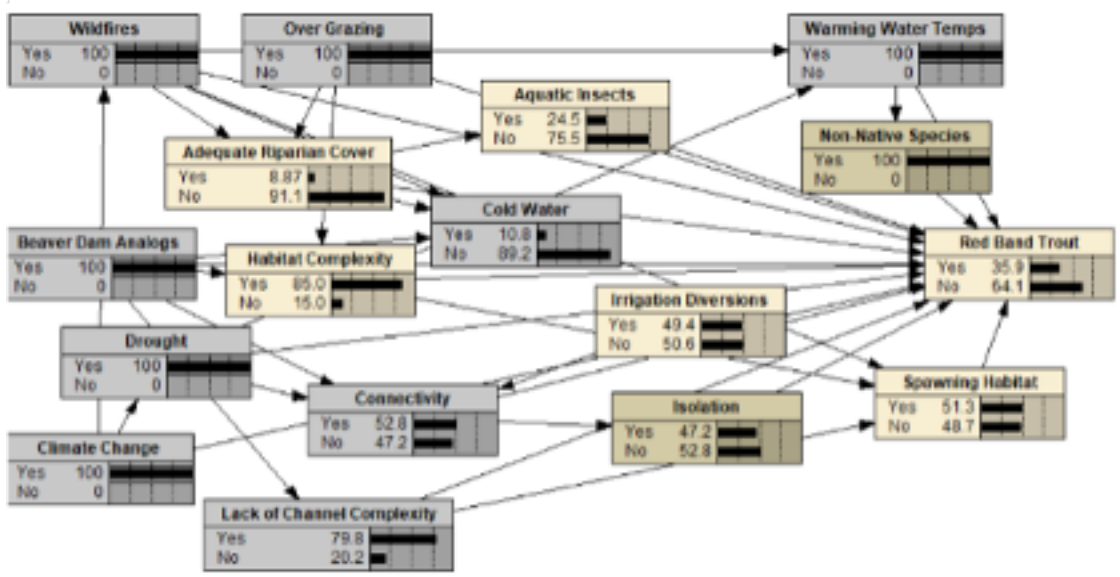
Time-table of key activities, outputs/deliverables, and outcomes



TIMELINE

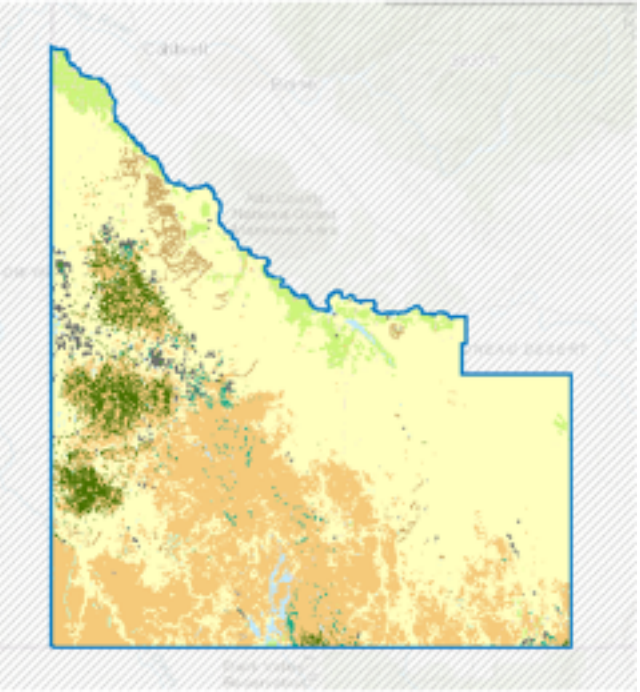
In interviews, research participants were asked about their perceptions of the components of the Redband Trout ecosystem, including how the components of the system were connected and how certain the experts were about the connections between the components.

Start	to	End	Quantifier	Confidence
Insect Life	to	Red band trout	1	Somewhat Confident
Healthy Riparian Habitat	to	Insect Life	0.78	Somewhat Confident
Healthy Riparian Habitat	to	Spawning Habitat	1	Somewhat Confident
Healthy Riparian Habitat	to	fine sediment	1	Somewhat Confident
Healthy Riparian Habitat	to	Cool water	0.56	Somewhat Confident
Healthy Riparian Habitat	to	Red band trout	1	Somewhat Confident
Beaver Dams	to	Healthy Riparian Habitat	1	Somewhat Confident
Grazing	to	Healthy Riparian Habitat	-0.86	Somewhat Confident
Roads next to Creeks	to	Healthy Riparian Habitat	-0.82	Somewhat Confident
Harvest Logging	to	Healthy Riparian Habitat	-0.56	Somewhat Confident



The level of uncertainty/certainty participants said was used in the BBN networks.

INTERVIEWS TO BBNs



Module Results

Land Change Modeler Decision Forest Model Results

Input Files

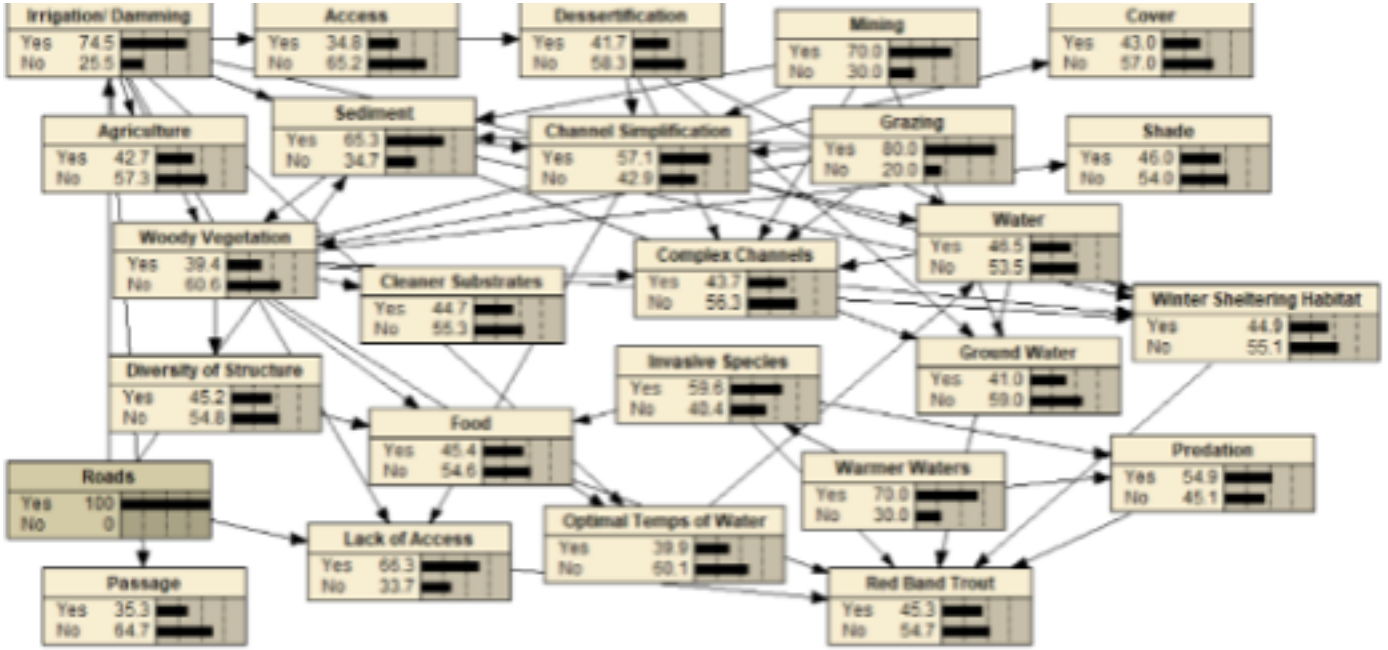
Independent variable 1	owyhee_bau_2011_reclass
Training site file	bautest_Train_lulc

Parameters and Performance

Number of trees	500
Number of variables at split	1
Out of bag (OOB) accuracy	89.81%
Out of bag (OOB) skill	0.8811
OOB accuracy with all variables	89.81%
OOB accuracy holding owyhee_bau_2011_reclass constant	70.97%

- Outputs of Geospatial Terrset Model were used to define parameters of second BBN draft.

- A 'Business as Usual' scenario was established as a baseline for other scenarios.
- Models iterations were run for until higher accuracy was achieved.



SCENARIO DEVELOPMENT

Rate of Change Matrix											
	Riparian Areas	Riparian Zone: Canopy Cover, %Bank	Agriculture. Grazing.	Channelization / Channel Complexity	Groundwater Availability	Erosion	Flow Channel Complexity and groundwater	Habitat Availability	Habitat Quality (maybe)	Climate	FISH Pop
Dataset	Geospatial Dataset: Source:	Geospatial Dataset: NLCD+Riparian Areas (shrub and forest) Source: NLCD, USFS	Geospatial Dataset: RAP Data, Inside Idaho Source:	Geospatial Dataset: Rosgen Classes (binary Map) Source:	Geospatial Dataset: Source:	Geospatial Dataset: Source:	Geospatial Dataset: Source:	Geospatial Dataset: Source:	Geospatial Dataset: Source:	Geospatial Dataset: RCP 8.5 Source: CMIP5	Geospatial Dataset: CDMETAPOP Source: Travis Seaborne
Business as Usual	Policy: Exclusion Area: Rate of Change:	Policy: Exclusion Area: Rate of Change:	Policy: Exclusion Area: Rate of Change:	Policy: Exclusion Area: Rate of Change:	Policy: Exclusion Area: Rate of Change:	Policy: Exclusion Area: Rate of Change:	Policy: Exclusion Area: Rate of Change:	Policy: Exclusion Area: Rate of Change:	Policy: Exclusion Area: Rate of Change:	Policy: Exclusion Area: Rate of Change:	Policy: Exclusion Area: Rate of Change:
Scenario 1	Policy: Exclusion Area: Rate of Change:	Policy: Exclusion Area: Rate of Change:	Policy: Exclusion Area: Rate of Change:	Policy: Exclusion Area: Rate of Change:	Policy: Exclusion Area: Rate of Change:	Policy: Exclusion Area: Rate of Change:	Policy: Exclusion Area: Rate of Change:	Policy: Exclusion Area: Rate of Change:	Policy: Exclusion Area: Rate of Change:	Policy: Exclusion Area: Rate of Change:	Policy: Exclusion Area: Rate of Change:
Scenario 2	Policy: Exclusion Area: Rate of Change:	Policy: Exclusion Area: Rate of Change:	Policy: Exclusion Area: Rate of Change:	Policy: Exclusion Area: Rate of Change:	Policy: Exclusion Area: Rate of Change:	Policy: Exclusion Area: Rate of Change:	Policy: Exclusion Area: Rate of Change:	Policy: Exclusion Area: Rate of Change:	Policy: Exclusion Area: Rate of Change:	Policy: Exclusion Area: Rate of Change:	Policy: Exclusion Area: Rate of Change:

BBN runs were used to inform a ‘scenario crosswalk’ used to parameterize scenarios

SCENARIO DEVELOPMENT

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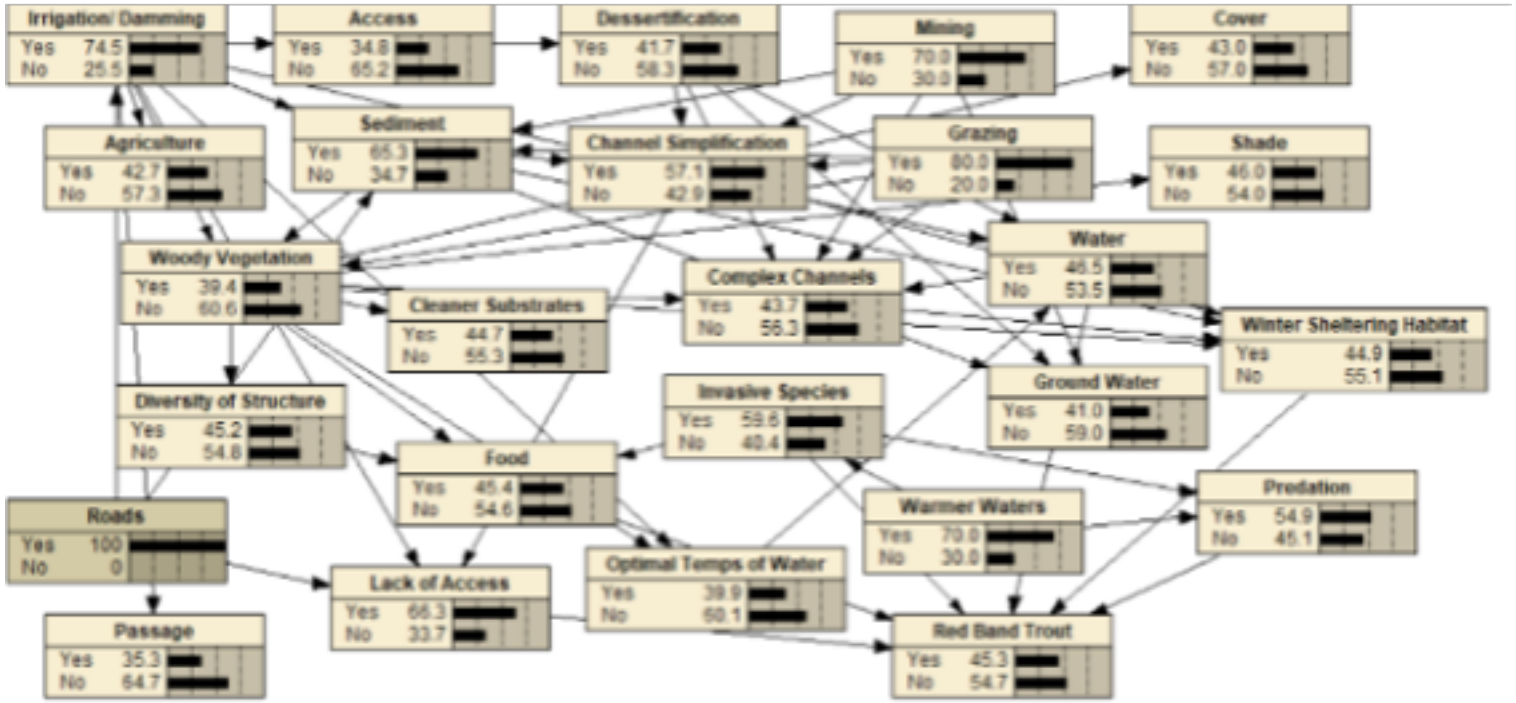
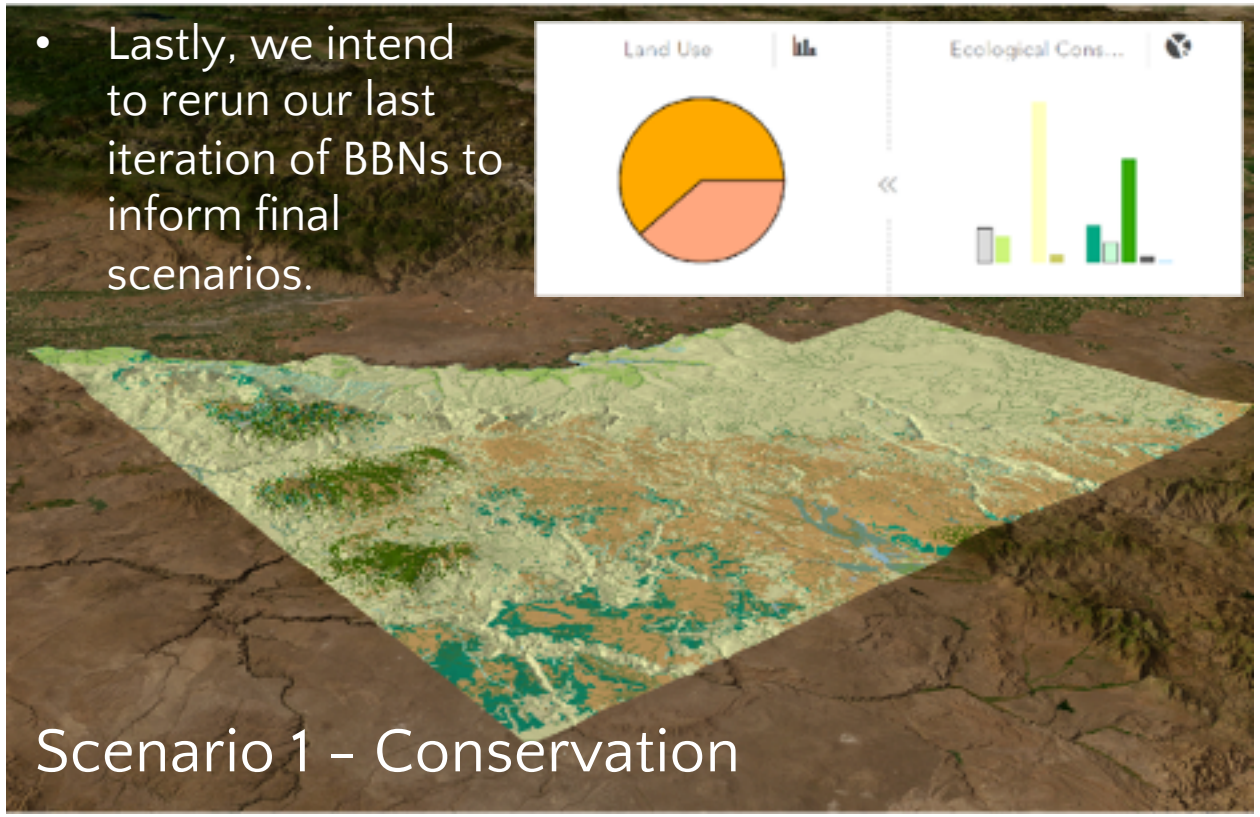
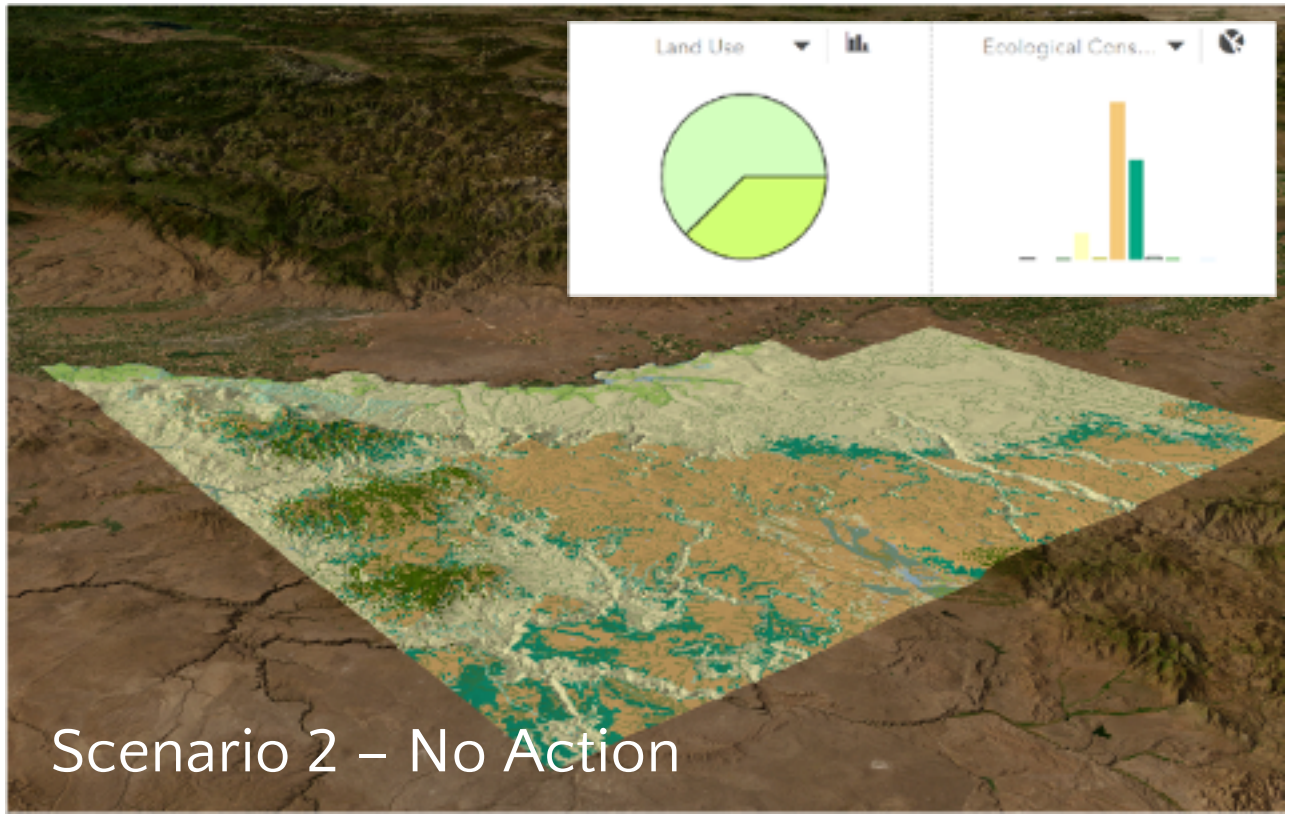


- We are currently recalibrating our BBN models for a scenario-based BBN runs.
- This final run will be used to create other geospatial scenarios through Terrset.

SCENARIO CALIBRATION



- Lastly, we intend to rerun our last iteration of BBNs to inform final scenarios.



TAKEAWAYS

1) Convergent research methodologies were used to inform qualitative and quantitative means to inform scenarios

2) The research developed a framework to utilize effective means for coupling Interview Data, BBNs, and Geospatial Data

SCENARIO & ALTERNATIVE FUTURE RESULTS