

Public Goods versus Public Services: Economic and fiscal impacts of natural Gas Development in the Jack Morrow Hills of Wyoming.

by

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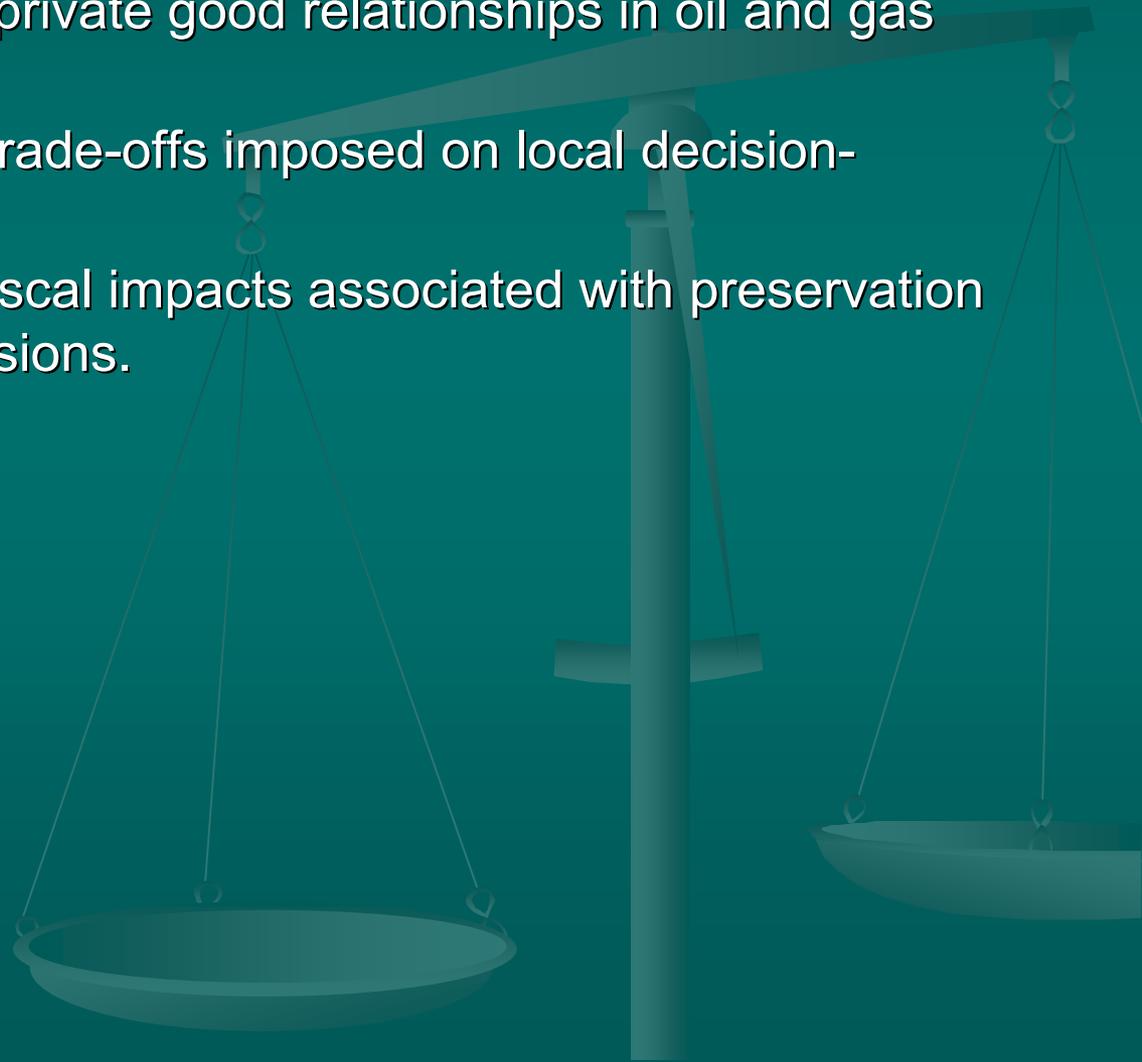
U.S. Bureau of Land Management,
Wyoming State Office

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Objectives

- Investigate the public and private good relationships in oil and gas development
- Identify the scope of the trade-offs imposed on local decision-makers.
- Estimate economic and fiscal impacts associated with preservation versus development decisions.



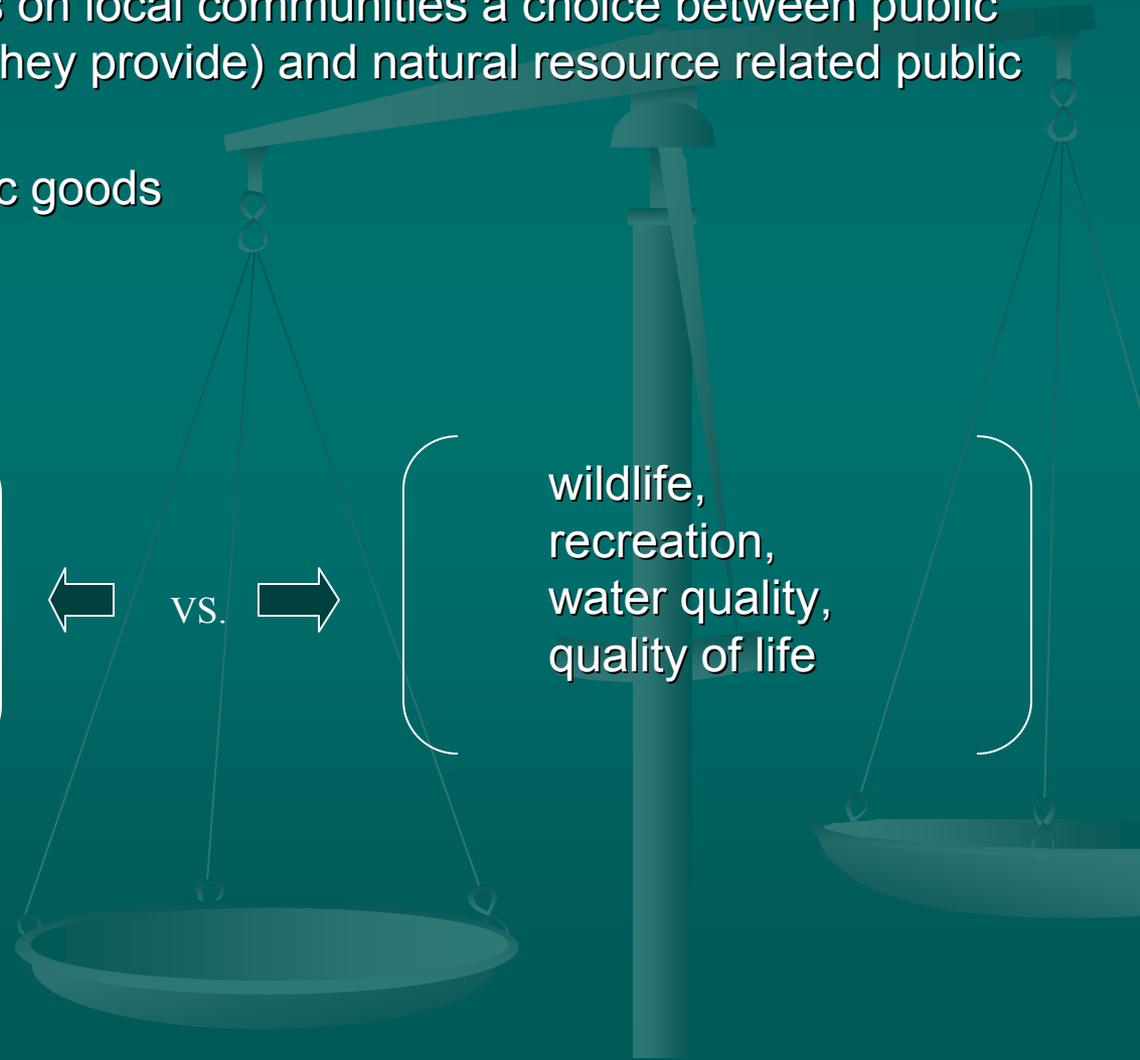
The Issue: (“faustian decision”)

- The NEPA process imposes on local communities a choice between public services (the public goods they provide) and natural resource related public goods
- Public services versus public goods

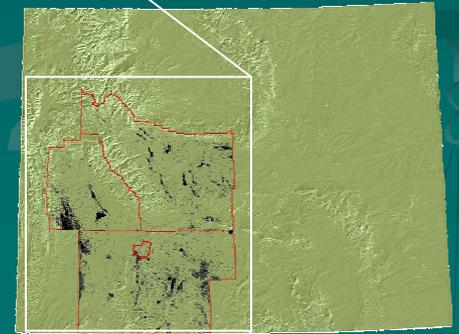
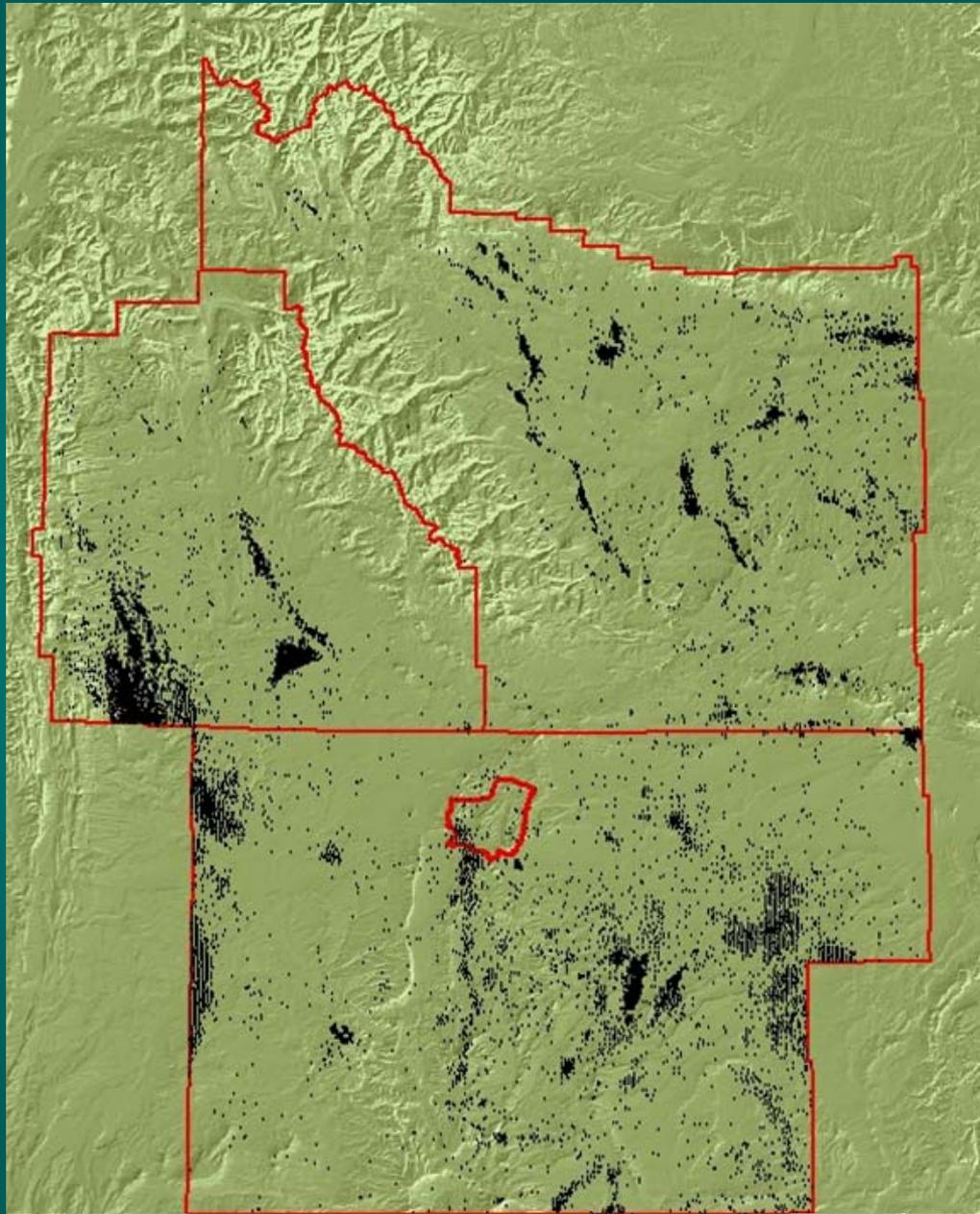
Roads,
health,
schools,
emergency services

← vs. →

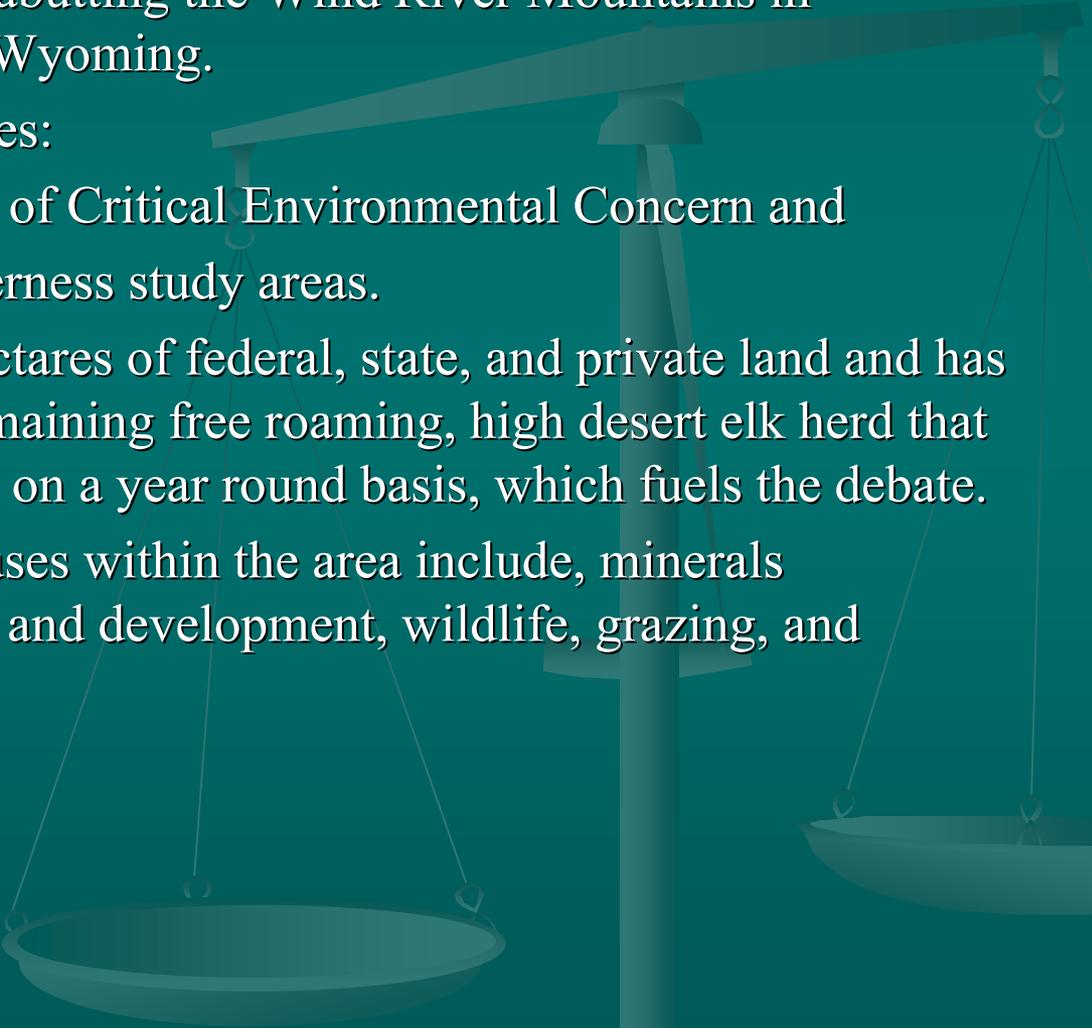
wildlife,
recreation,
water quality,
quality of life



Jack Morrow Hills Area in relation to the State of Wyoming



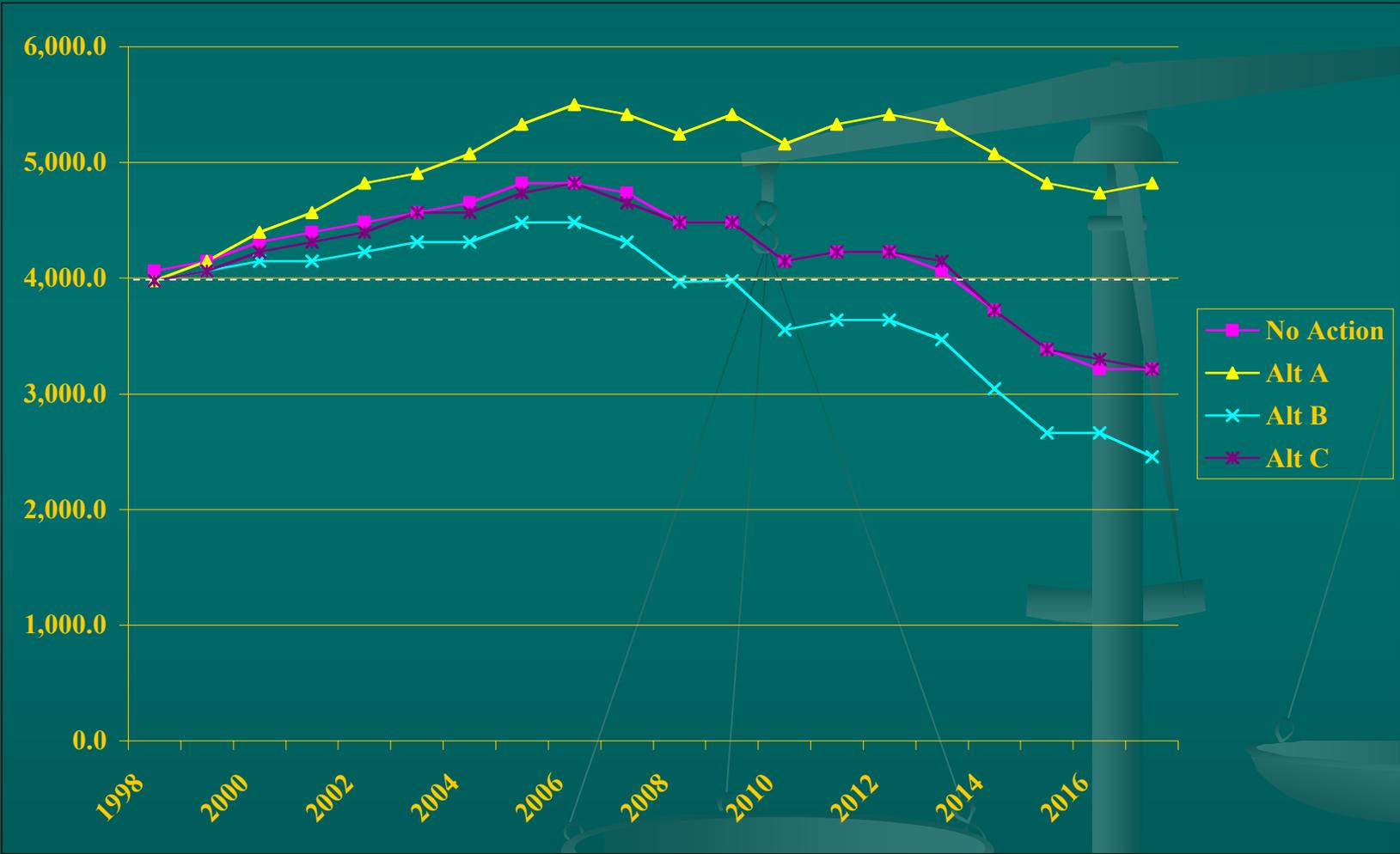
Description of the area

- The Jack Morrow Hills (JMH) area is located in the high desert area abutting the Wind River Mountains in Southwest Wyoming.
 - Encompasses:
 - three Areas of Critical Environmental Concern and
 - seven wilderness study areas.
 - 251,853 hectares of federal, state, and private land and has the only remaining free roaming, high desert elk herd that reside there on a year round basis, which fuels the debate.
 - Dominant uses within the area include, minerals exploration and development, wildlife, grazing, and recreation.
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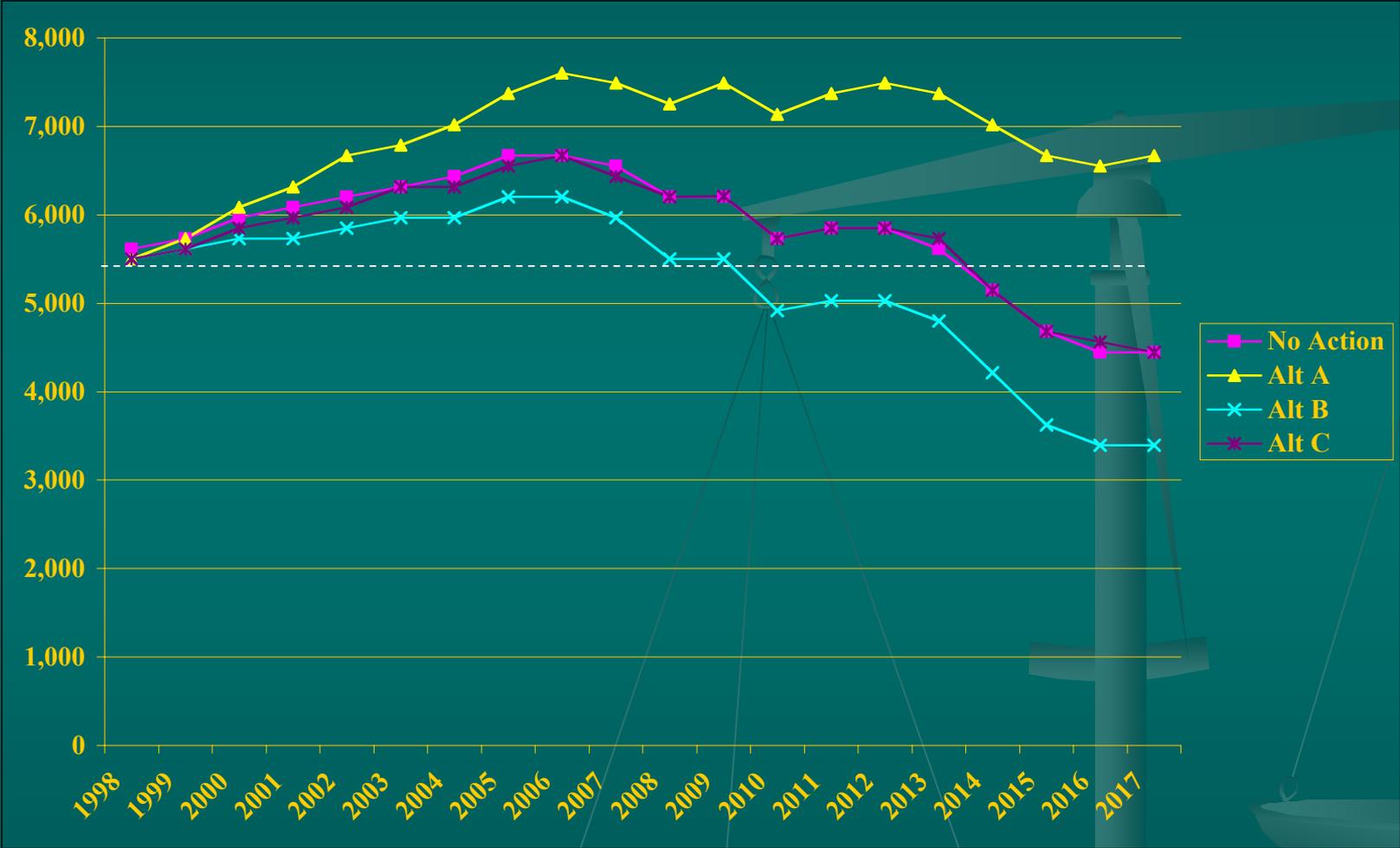
Oil and Gas Assumptions

Price Per Barrel of Crude Oil:	\$26.00
Price Per MCF of Natural Gas:	\$3.00
Total Impact Per Barrel of Crude Oil:	\$34.16
Total Impact Per MMCF of Natural Gas:	\$3,613.38
Earnings Per Barrel of Crude Oil:	\$2.50
Earnings Per MMCF of Natural Gas:	\$188.14
Jobs Per Barrel of Crude Oil (AJE):	0.000072
Jobs Per MMCF of Natural Gas (AJE):	0.005387
Assessed Valuation/Price Crude Oil:	93.66%
Assessed Valuation/Price Natural Gas:	80.95%
SWWYO Tax Revenue/Assessed Valuation Crude Oil:	7.11%
SWWYO Tax Revenue/Assessed Valuation Natural Gas:	7.58%

Assumed Gas Production Trends



Assumed Oil Production Trends



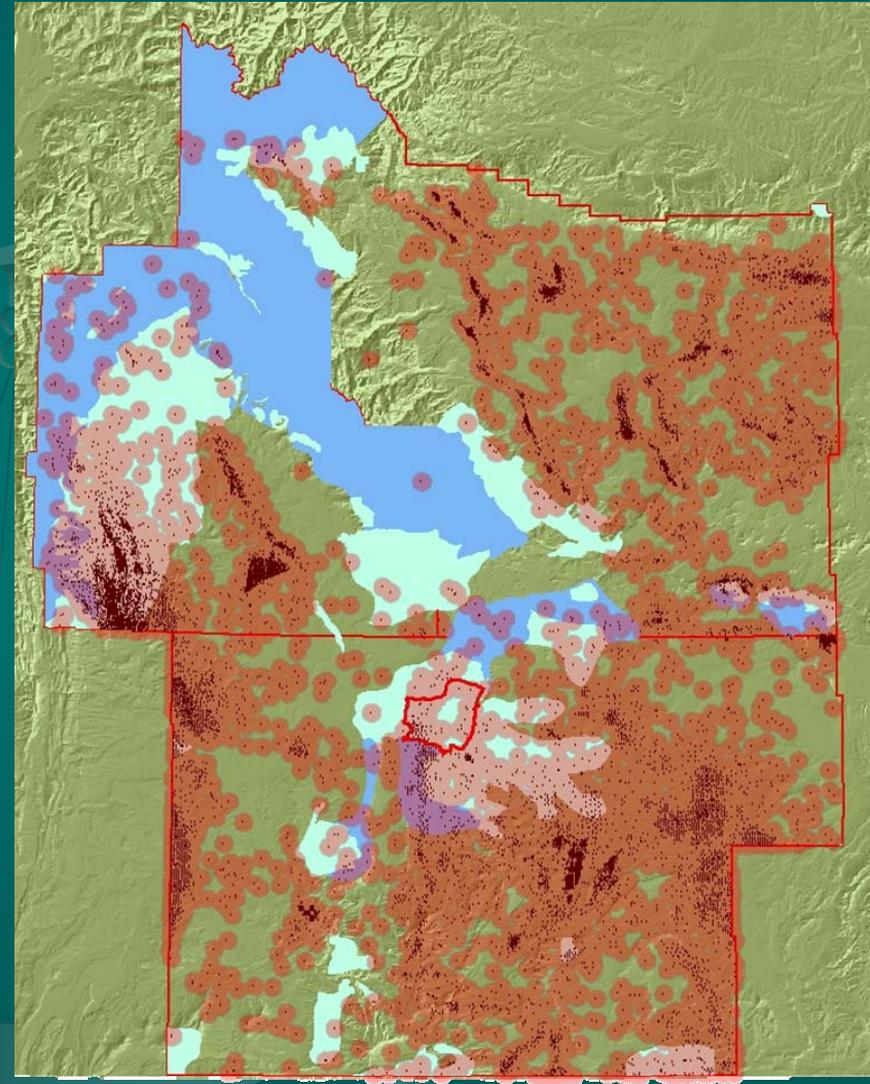
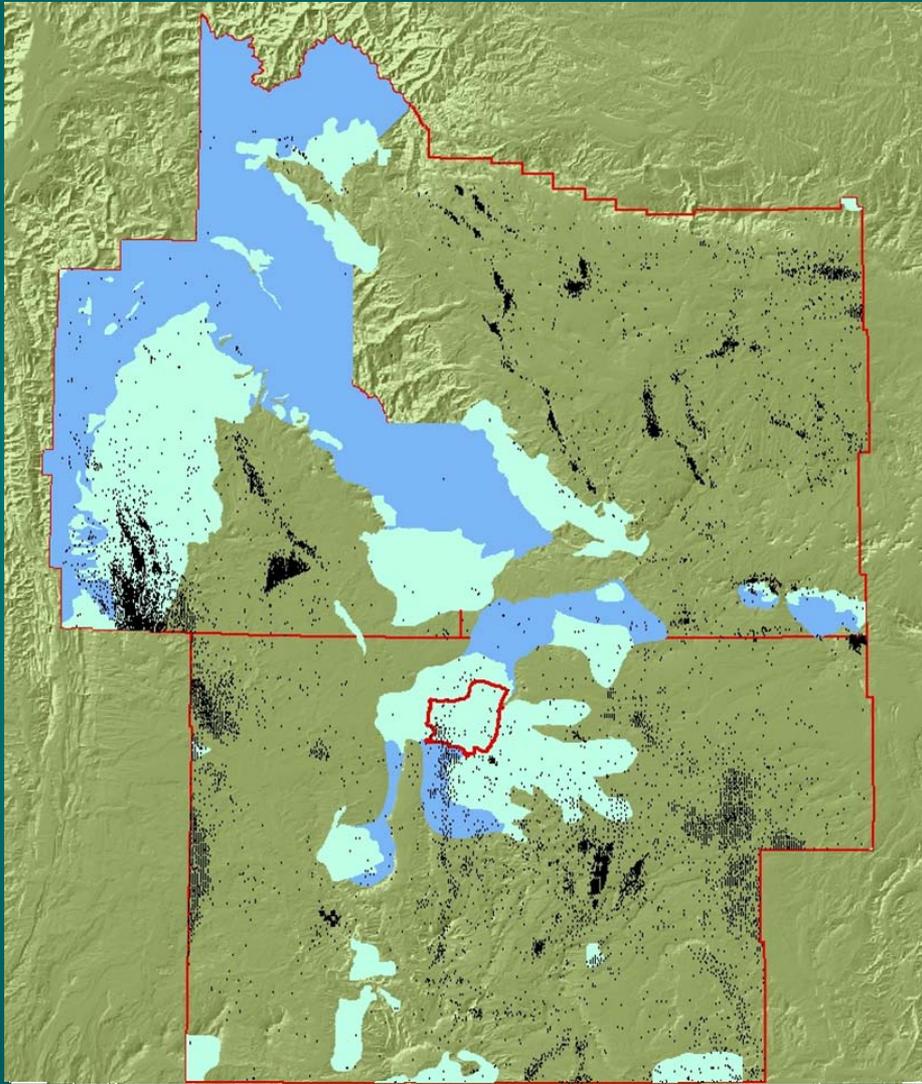
The critical concern was what would happen to the resident elk herd if oil and gas development were expanded

- Estimated the economic and fiscal impacts based upon the agencies identified alternatives.
- Comparison between alternatives in terms of fiscal and economic impacts.
- wildlife estimates were based upon judgment calls by state and federal agency biologists



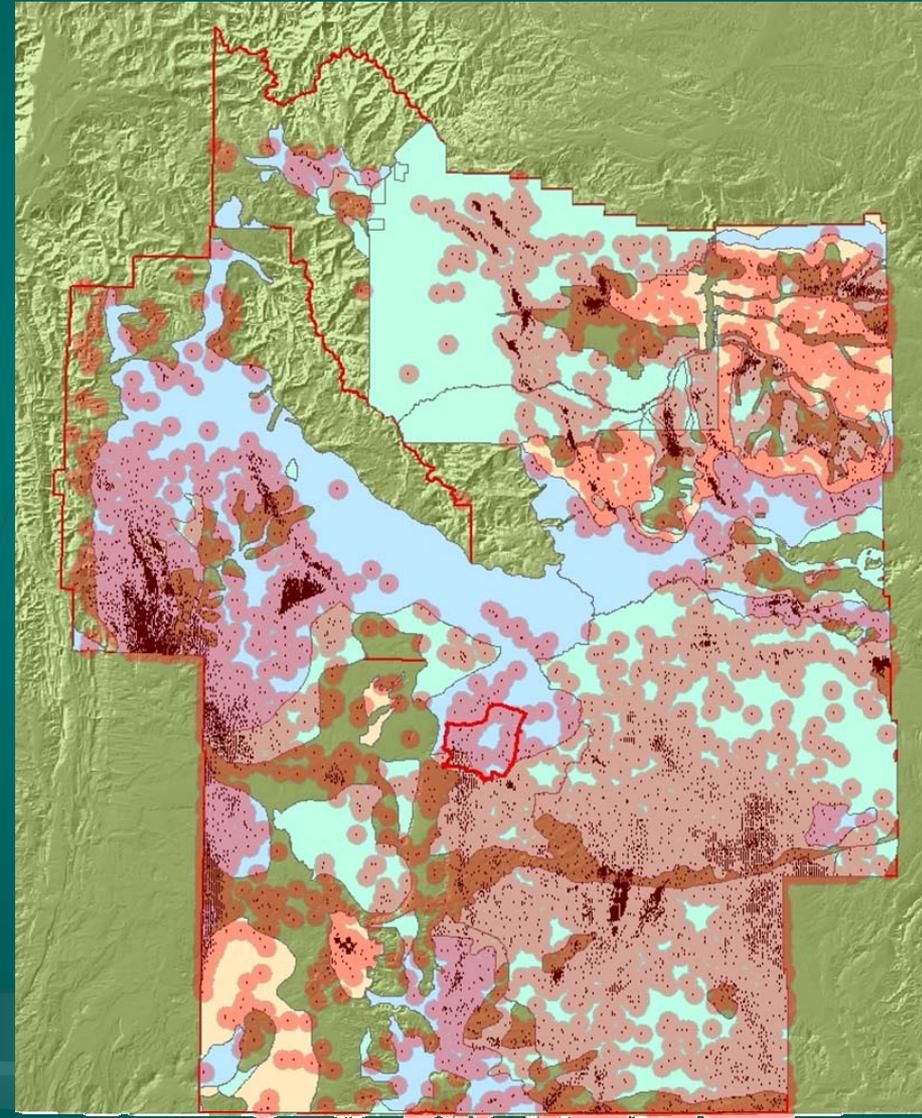
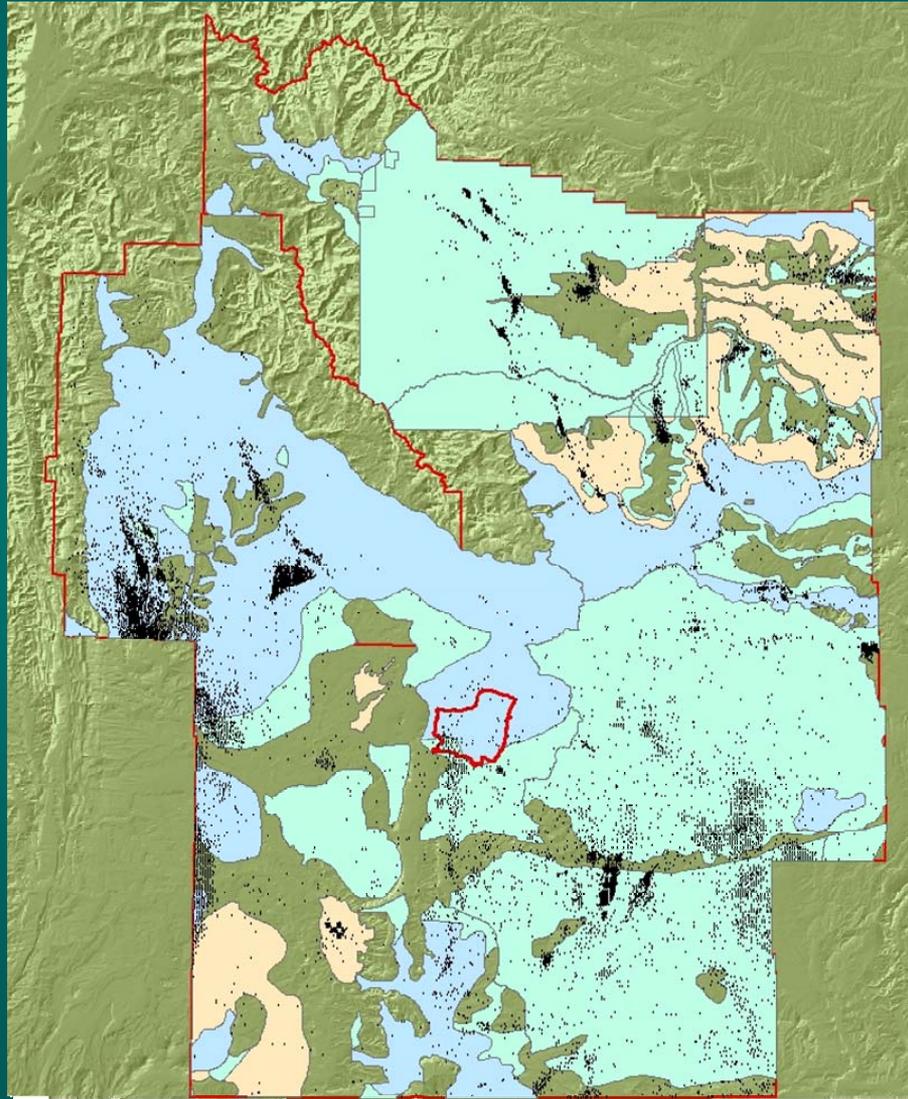
Seasonal Elk Range in relation to location of gas wells in Southwest Wyoming

Wells with a 3 km. impact area identified



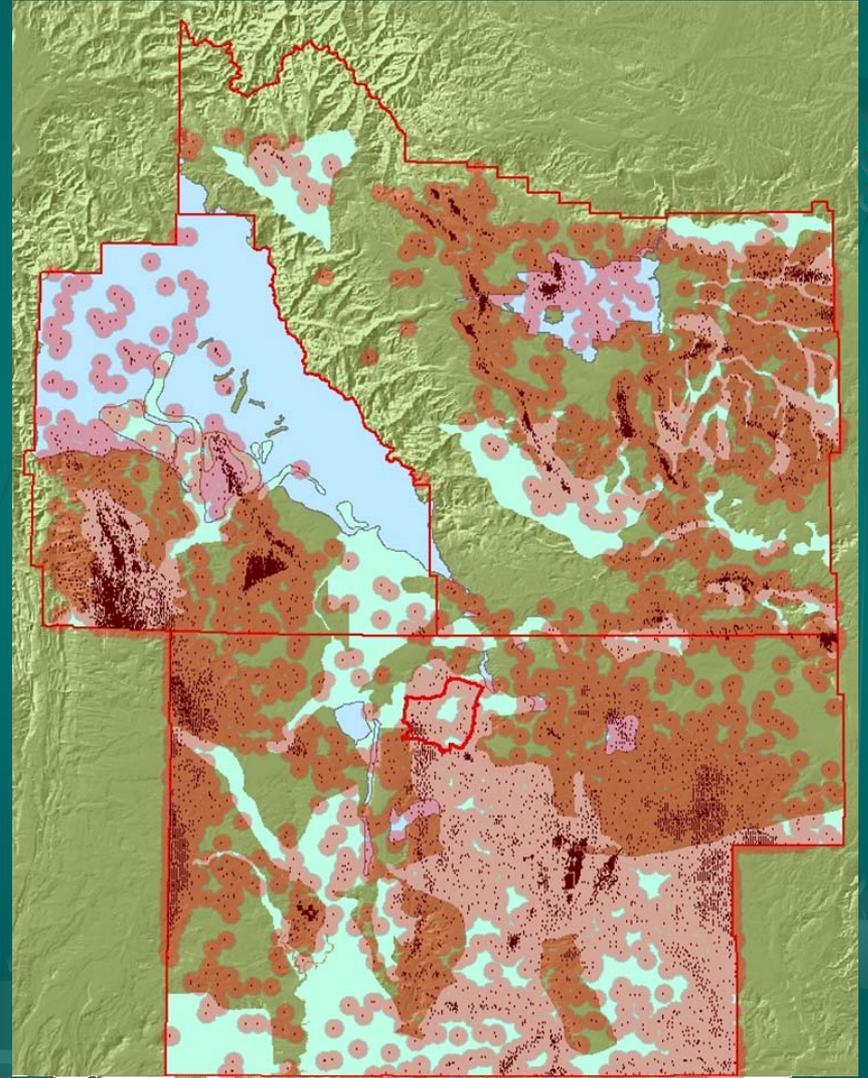
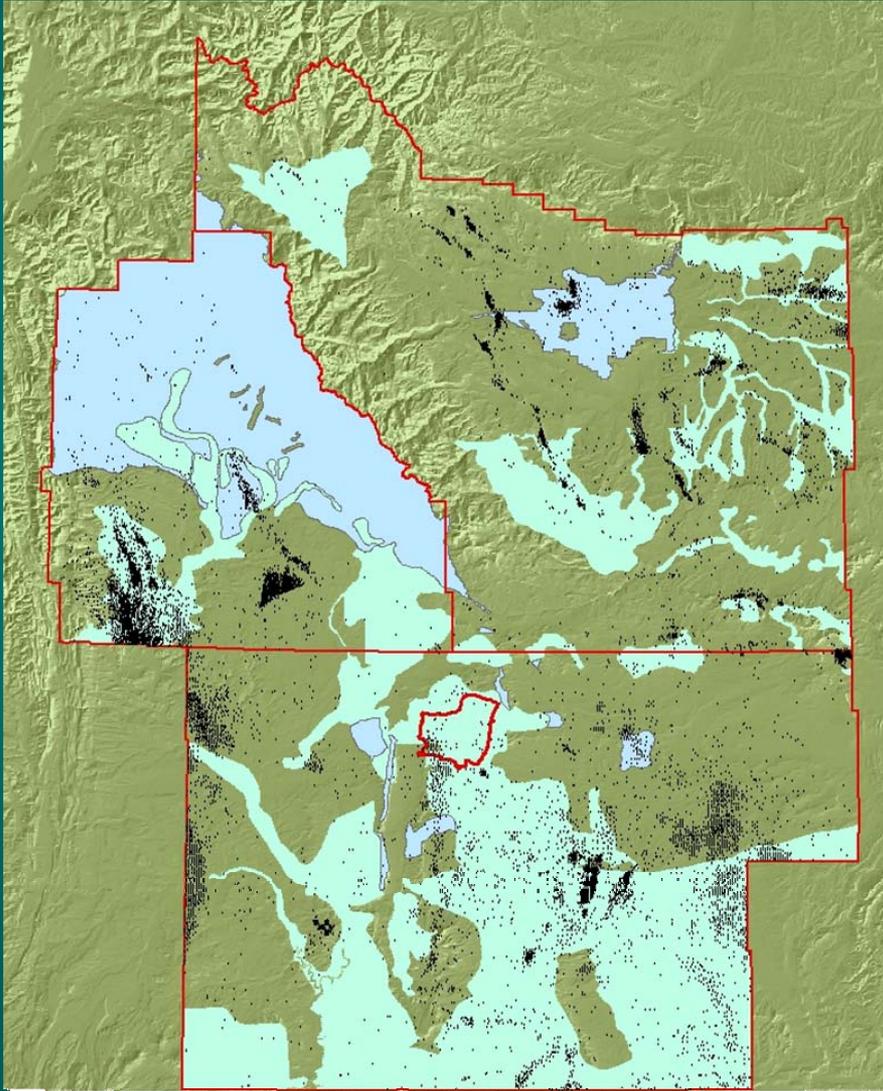
Seasonal Pronghorn Antelope Range in relation to location of gas wells in Southwest Wyoming

Wells with a 3 km. impact area identified



Seasonal Mule Deer Antelope Range in relation to location of gas wells in Southwest Wyoming

Wells with a 3 km. impact area identified



Wildlife Assumptions

Expenditure per day Estimates			
Expenditures	Total Expenditures	Non-local Expenditures	Local Expenditures
Non-resident Elk Hunters	\$239.40	\$71.41	\$167.99
Non-resident Deer Hunters	\$139.06	\$57.05	\$82.01
Non-resident Antelope Hunters	\$239.62	\$68.47	\$171.15
Non-resident Non-consumptive users	\$55.00	\$0.54	\$54.46

Assumed Elk Hunter Day Trends



Method

- use BLM estimates of oil and gas production levels and recreation use changes
- model wildlife impacts to be consistent with agency biologist “judgment” estimates
- Use an input output model and fiscal impact model developed for south west wyoming

Model structure:

- IO model:
 - partial survey based model that localizes oil and gas, recreation, and agricultural sectors.
 - IMPLAN based - most federal agencies and many state agencies increasingly rely on IMPLAN for consistency cost issues.
- Fiscal modeling: system of log - log equations, estimated using SUR

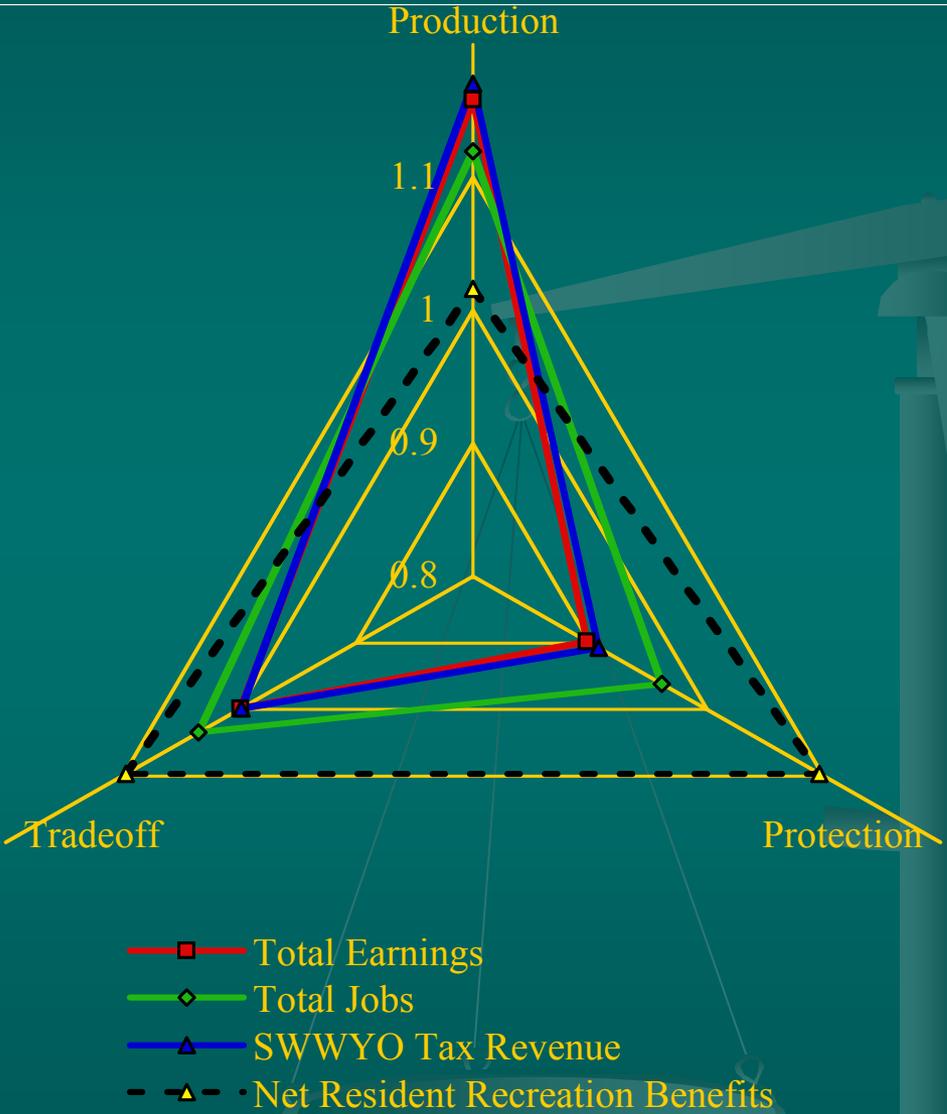
$$\text{County_Rev} = CR(\text{rural_pop}, \text{urban_pop}, \text{agrland}, \text{MineralPRod})$$

$$\text{County_exp} = CR(\text{rural_pop}, \text{urban_pop}, \text{agrland}, \text{MineralPRod})$$

Results:

	No Action Alternative	Alternative A Production	Alternative B Protection	Alternative C Resource Tradeoff
Direct Impacts	347,544,467	410,185,095	305,186,318	343,499,956
Total Impacts	445,396,630	524,643,105	388,193,577	439,502,678
Total Earnings	38,446,126	45,144,903	32,491,821	37,670,140
Total Employment	1,860	2,078	1,600	1,824
Local Govt. Revenue	\$17,515,119	\$20,544,989	\$15,549,022	\$17,360,911
Resident Recreation	\$13,778,703	\$12,771,602	\$13,778,703	\$13,785,583
Changes relative to the base (no action alternative)				
Direct Impacts		1.180	\$0.878	\$0.988
Total Impacts		1.178	\$0.872	\$0.987
Total Earnings		1.174	\$0.845	\$0.980
Total Employment		1.117	\$0.860	\$0.980
Local Govt. Revenue		1.173	\$0.888	\$0.991
Resident Recreation		0.927	\$1.000	\$1.000

Relative impacts from the three scenarios



Conclusions, research enhancements, etc. ■

Policy issues:

- NEPA has a tendency to put local communities in the middle of the battleground
- There needs to be a broader discussion of win - win ideas; compromise tends to be a long term unstable solution: a solution that everyone equally despises.

Modeling Issues:

- Incorporation and improvement of the fiscal impact modeling
- enhanced ecological modeling
- Others?

