Impact Assessment and the Landscape Approach

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Bruce McKenney
Strategy Director, Development by Design
The Nature Conservancy

IAIA Symposium
February 7-8, 2013
Washington, DC

Oil and Gas Wells in the Wyoming Basins Ecoregion

2011

Mineral Leases in Mongolia

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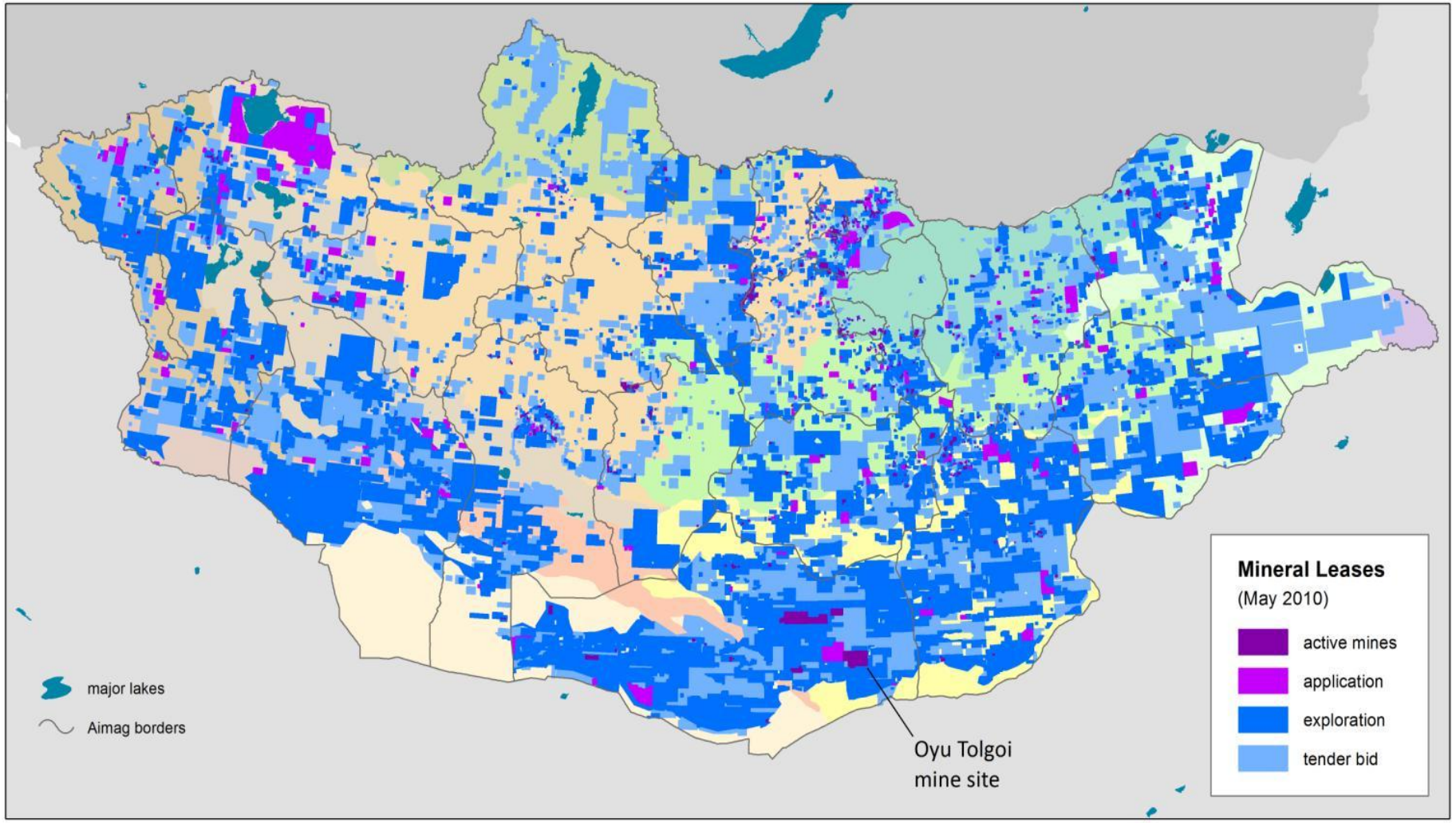

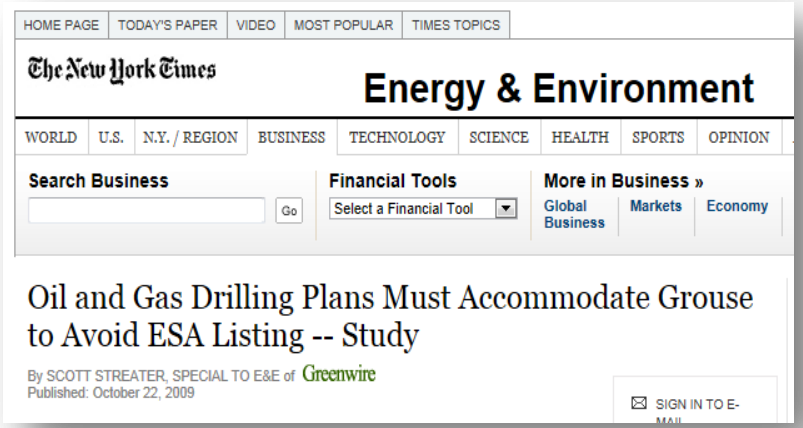
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Oil and Gas Drilling Plans Must Accommodate Grouse to Avoid ESA Listing -- Study

By SCOTT STREATER, SPECIAL TO E&E of Greenwire
Published: October 22, 2009

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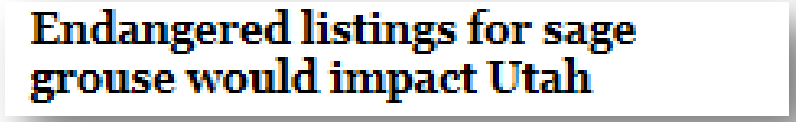
PENDLEY: Killing jobs to save the sage grouse

Junk science, weird science and plain nonsense


Fewer Cattle Allowed On Idaho Sage Grouse Habitat

Jan. 29, 2013 | AP


Endangered listings for sage grouse would impact Utah


THE UB POST

Age old Mongolian nomadic heritage under threat due to mining

Friday, November 30th, 2012

Booming Mongolia

Mine, all mine


The Economist

The country that is likely to grow faster than any other in the next decade, and how it is changing, for better or worse

Mongolia Gold Rush Destroying Rivers, Nomadic Lives

National Geographic News

October 17, 2008


npr

news ▸ world ▸ asia ▸ mongolia booms

Mineral-Rich Mongolia Rapidly Becoming 'Mine-golia'

by FRANK LANGFITT

May 21, 2012 2:59 AM

Future Energy and Mining Development

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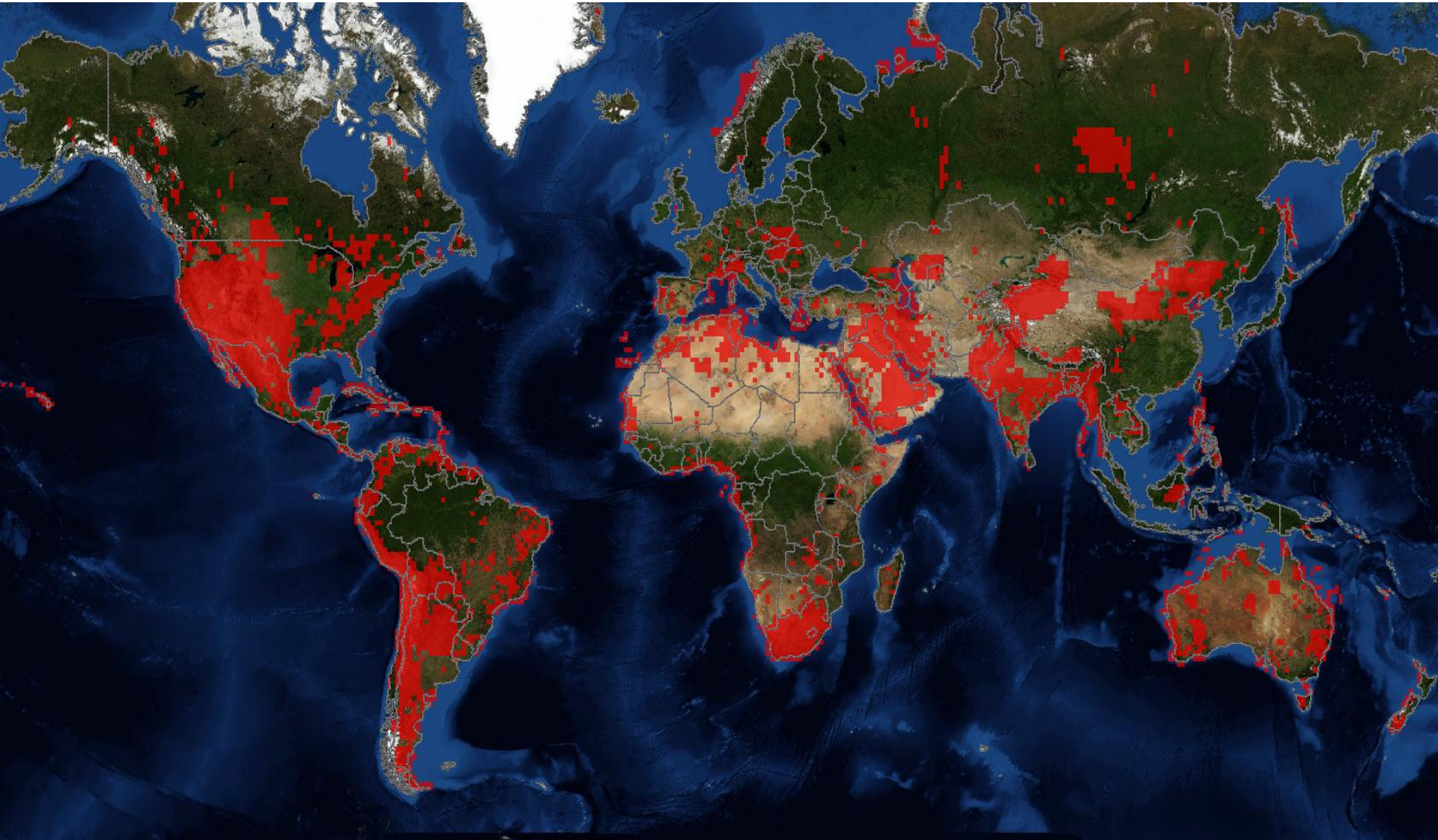

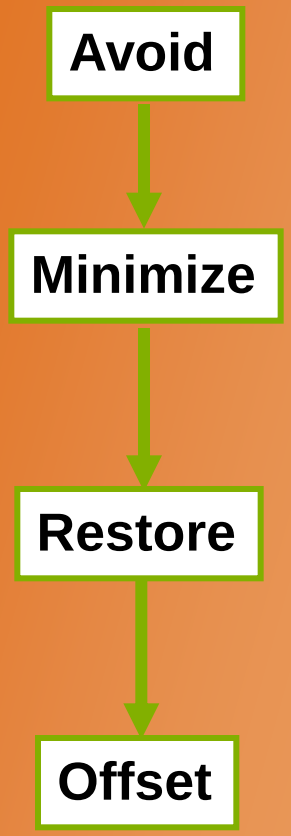

Key Problems with Mitigation

- Improper ecological scale
- Reactive piecemeal planning
- Lack of defined outcome

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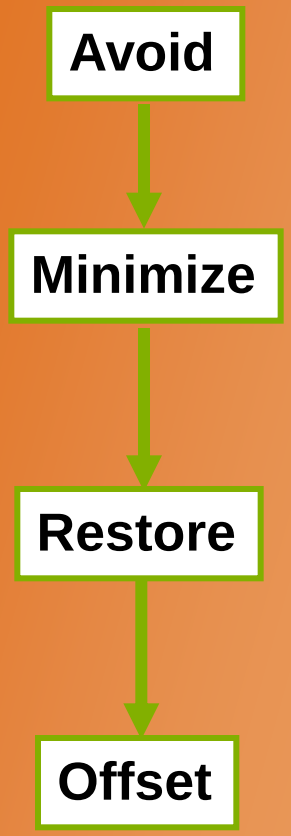
Benefits of Landscape Planning



- Conservation priorities in context of potential cumulative impacts
- Application of the mitigation hierarchy
  - ❖ Avoidance and minimization
  - ❖ Offset selection and design
  - ❖ Net positive impact goals
- Lending performance standards; policy and regulatory requirements

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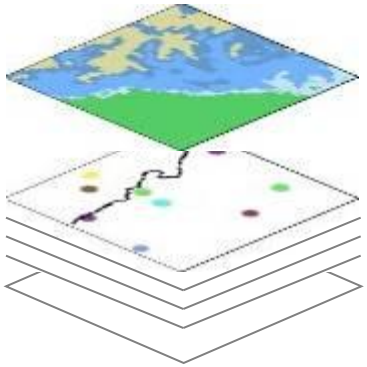
"This place has a reputation as a biodiversity hot spot."

Conservation Planning: portfolio design process

Select BIODIVERSITY ELEMENTS



COARSE FILTER
Vegetation Types

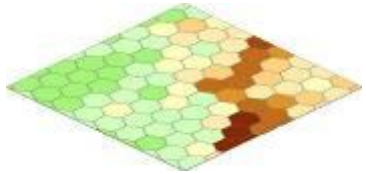
FINE FILTER
Species

Set GOALS

(x) Acres of habitat needed to maintain viability

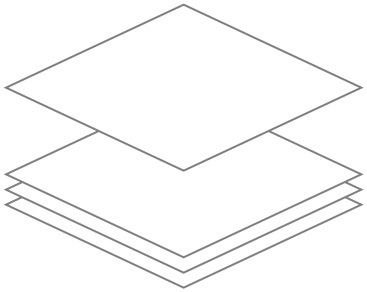
(Y) Acres of habitat or point locations (i.e. nests) needed to maintain viability

assess ECOLOGICAL CONDITION



Cost / Suitability Index

- Road & RR Density
- Population Density
- Converted Land Cover
- Irrigated Land Cover
- Housing density

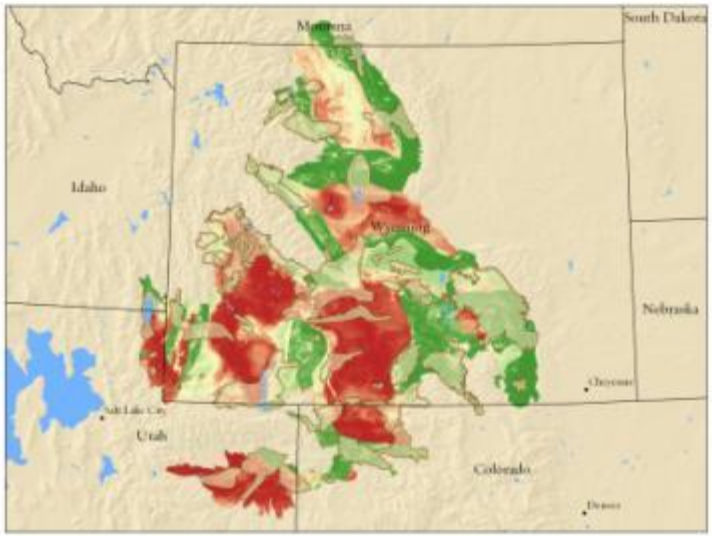


Future development pressure

other rules

Conservation Portfolio Design:

automated site selection (MARXAN)



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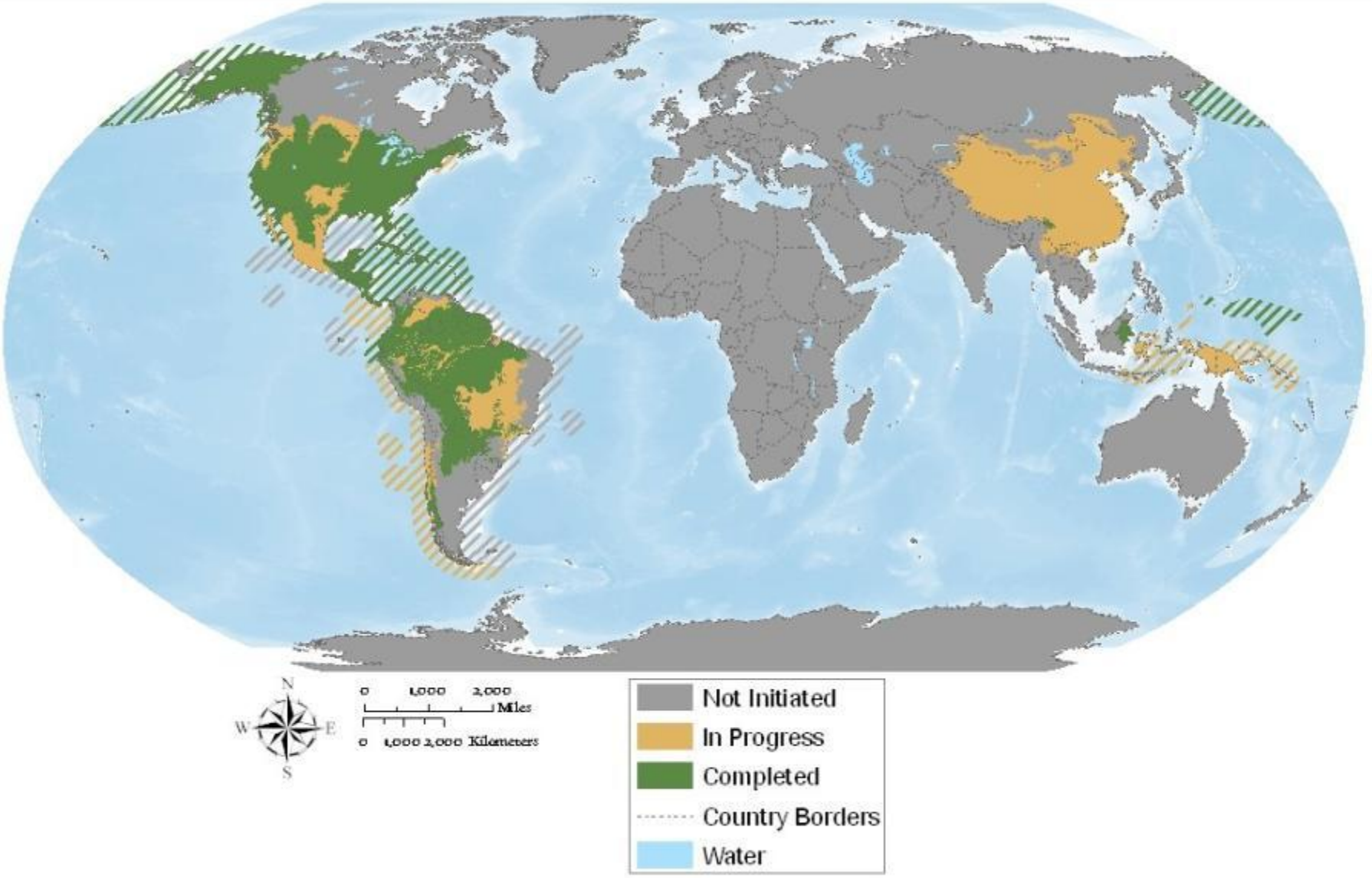
Ecoregional Assessment Status Worldwide

(Terrestrial and Marine)



Mongolia's Eastern Steppe and Gobi Regions:
Development by Design Eco-regional Assessment Areas

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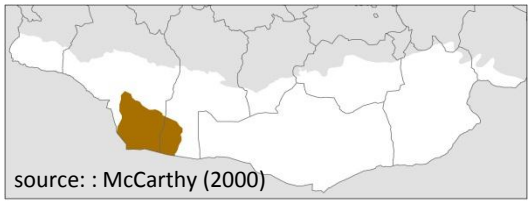
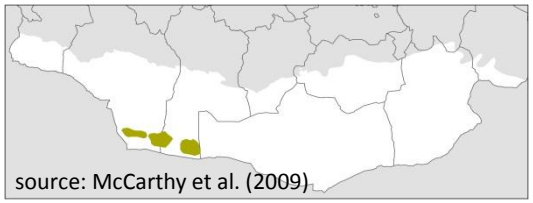
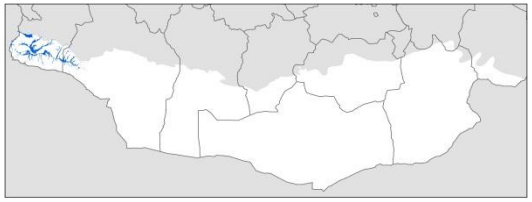
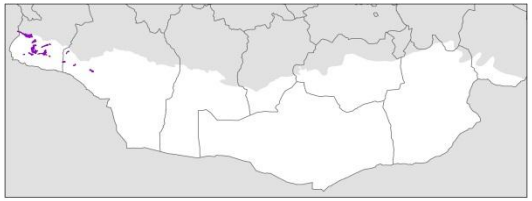
globally and nationally endangered



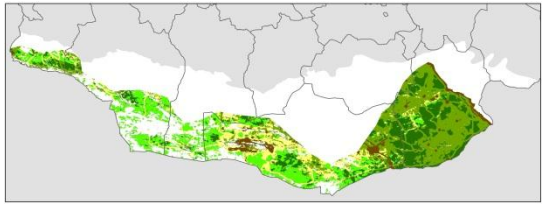


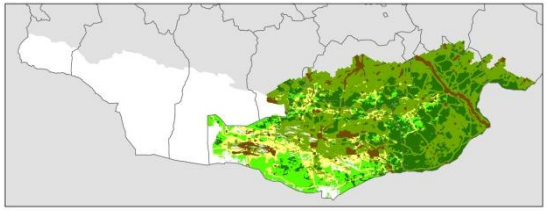
endemic / restricited range



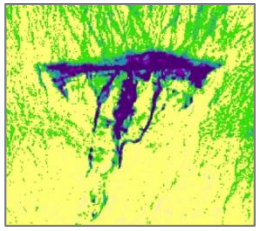


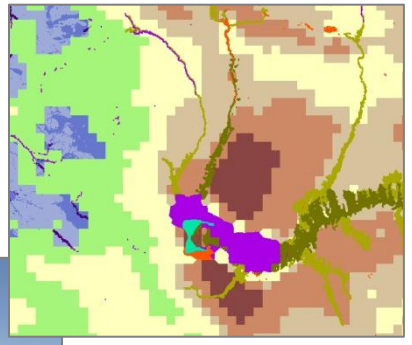
congretory and migratory

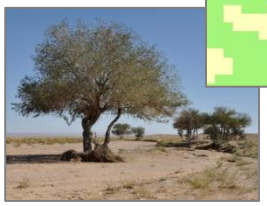




unique ecosystems







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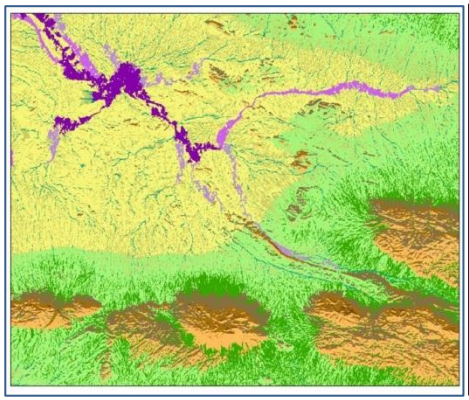
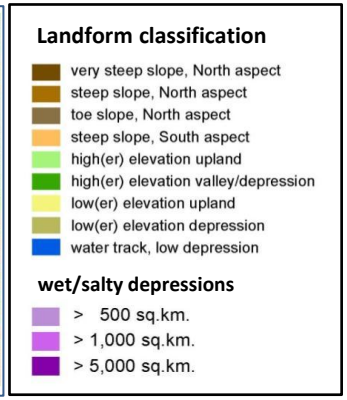
key evolutionary processes





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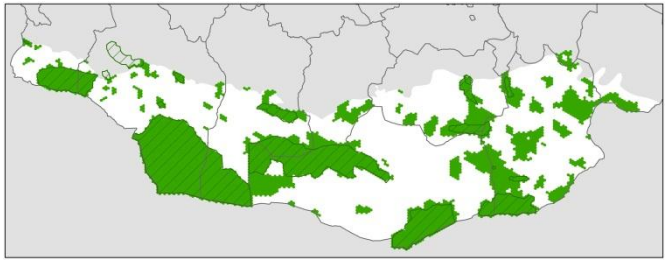
conservation portfolio = critical habitat



Potential conflict areas between Gobi conservation portfolio and current leases

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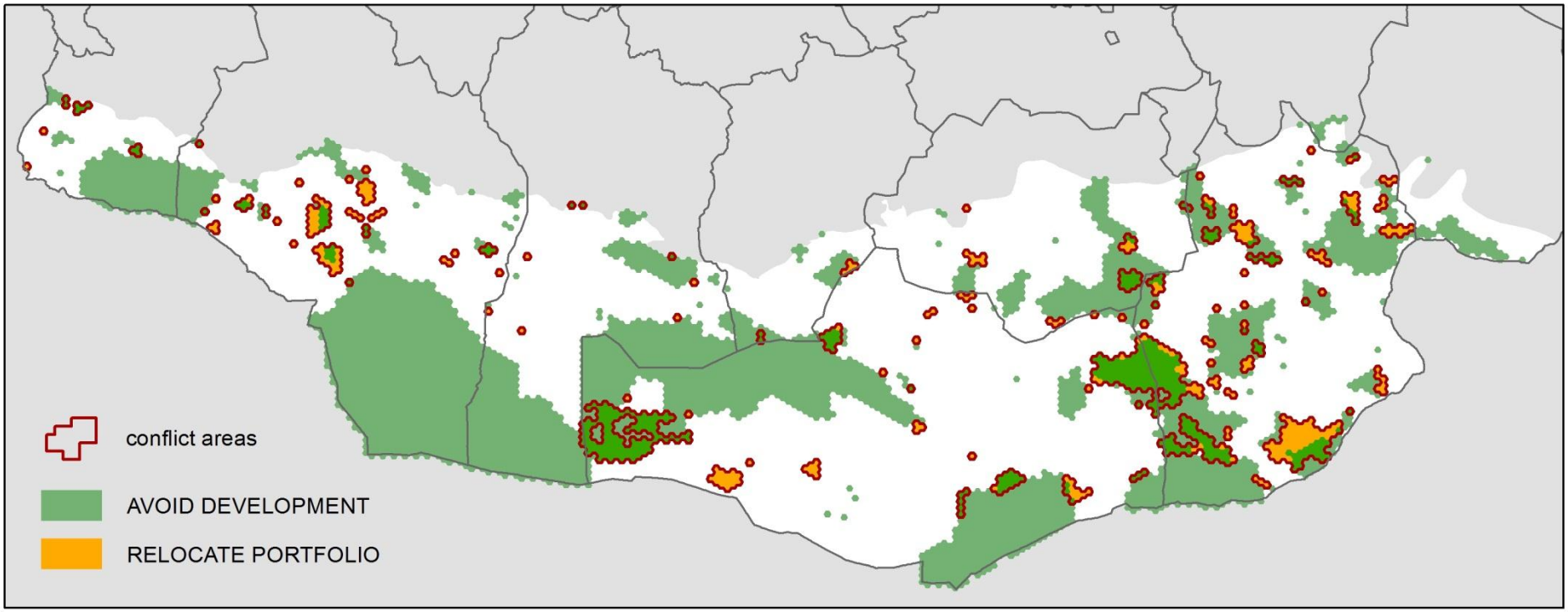

Identification of critical, natural and modified habitat in the Gobi region consistent with IFC Performance Standard 6

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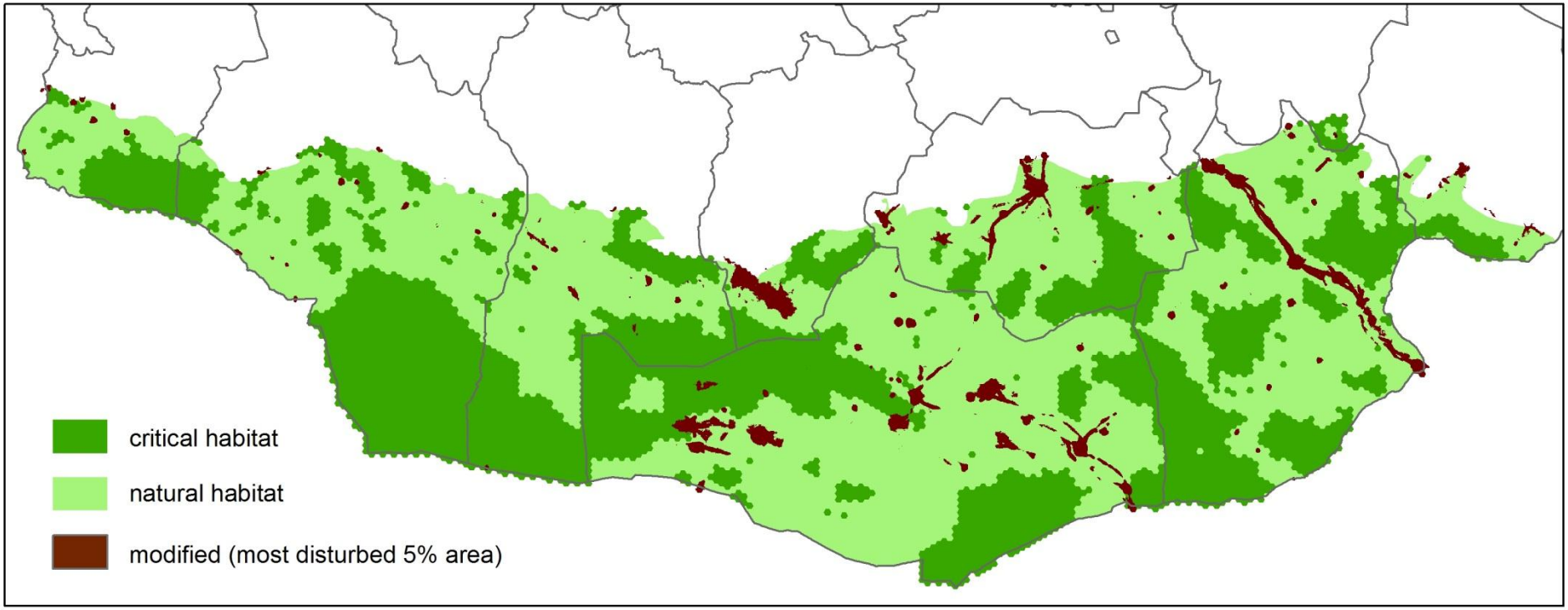

Guiding offset planning: An illustration

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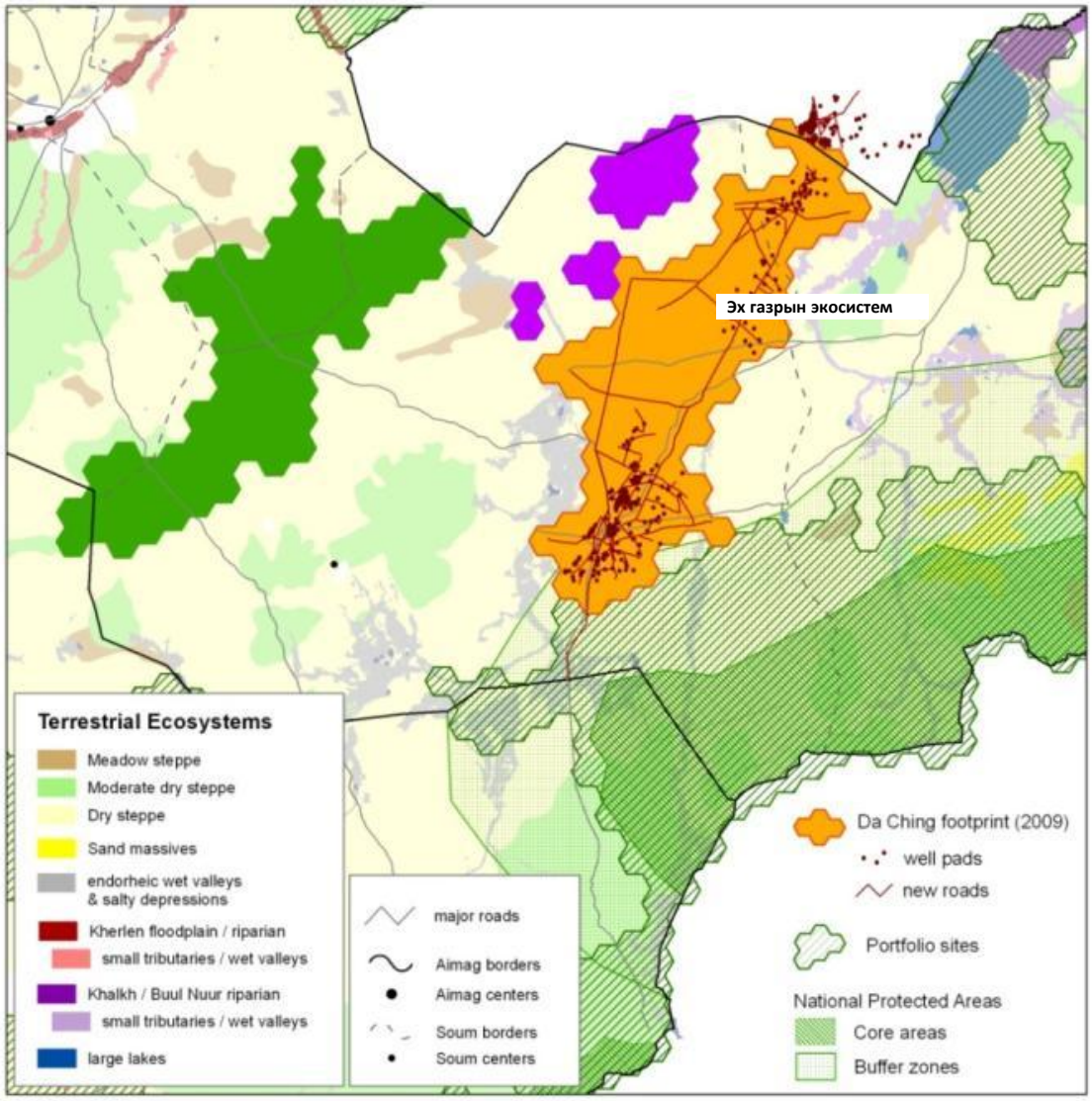

Development footprint

Ecosystem Type	AREA (km²)	
small water bodies	810	0.1%
Dry steppe | low elev. flat	526,538	74.5%
Dry steppe | low elev. hills	83,689	11.8%
Dry steppe | valley bottom	27,142	3.8%
wet salty depressions	68,196	9.7%
	706,375	100.0%

Composition of potential offset site areas

Ecosystem Type	AREA (km²)	
small water bodies	2,358	0.4%
Dry steppe | low elev. flat	306,096	50.2%
Dry steppe | low elev. hills	182,521	29.9%
Dry steppe | valley bottom	23,795	3.9%
wet salty depressions	19,267	3.2%
Meadow steppe | low elev. flat	6,390	1.0%
Mod. dry steppe | low elev. flat	34,669	5.7%
Mod. dry steppe | low elev. hills	31,464	5.2%
Mod. dry steppe | valley bottom	3,347	0.5%
	609,907	100.0%

Ecosystem Type	AREA (km²)	
small water bodies	383	0.3%
Dry steppe | low elev. flat	87,542	72.9%
Dry steppe | low elev. hills	13,212	11.0%
Dry steppe | valley bottom	4,183	3.5%
wet salty depressions	14,270	11.9%
Meadow steppe | low elev. flat	353	0.3%
Meadow steppe | low elev. hills	184	0.2%
	120,127	100.0%

Oil and Gas Wells in the Wyoming Basins Ecoregion

2011

Wells

Wells in avoid areas

Offsets

Kiesecker, JM, Sochi K, Heiner, M, McKenney, B et al. 2013. Development by Design: Using a Revisionist History to Guide a Sustainable Future. Encyclopedia of Biodiversity, 2nd Edition (editor S Levin), Academic Press, Pages: 5504

Sources: USGS, ESRI, TANA, AND, National Geographic, Esri, DeLorme, NAVTEQ, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, iPC, Sources: Esri, DeLorme, USGS, NPS