



Guidelines for Reducing the Impact of Linear Infrastructure on Migratory Mammals in Central Asia



Central Asia



Source: <http://www.orexca.com/centralasia.php>

- Many large migratory mammals
- Large intact habitats
- Rapid growth of industries
- Ensuing infrastructure development

CENTRAL ASIA AND AFFECTED MIGRATORY SPECIES



Central Asia Landscapes – Steppe



CENTRAL ASIA AND AFFECTED MIGRATORY SPECIES

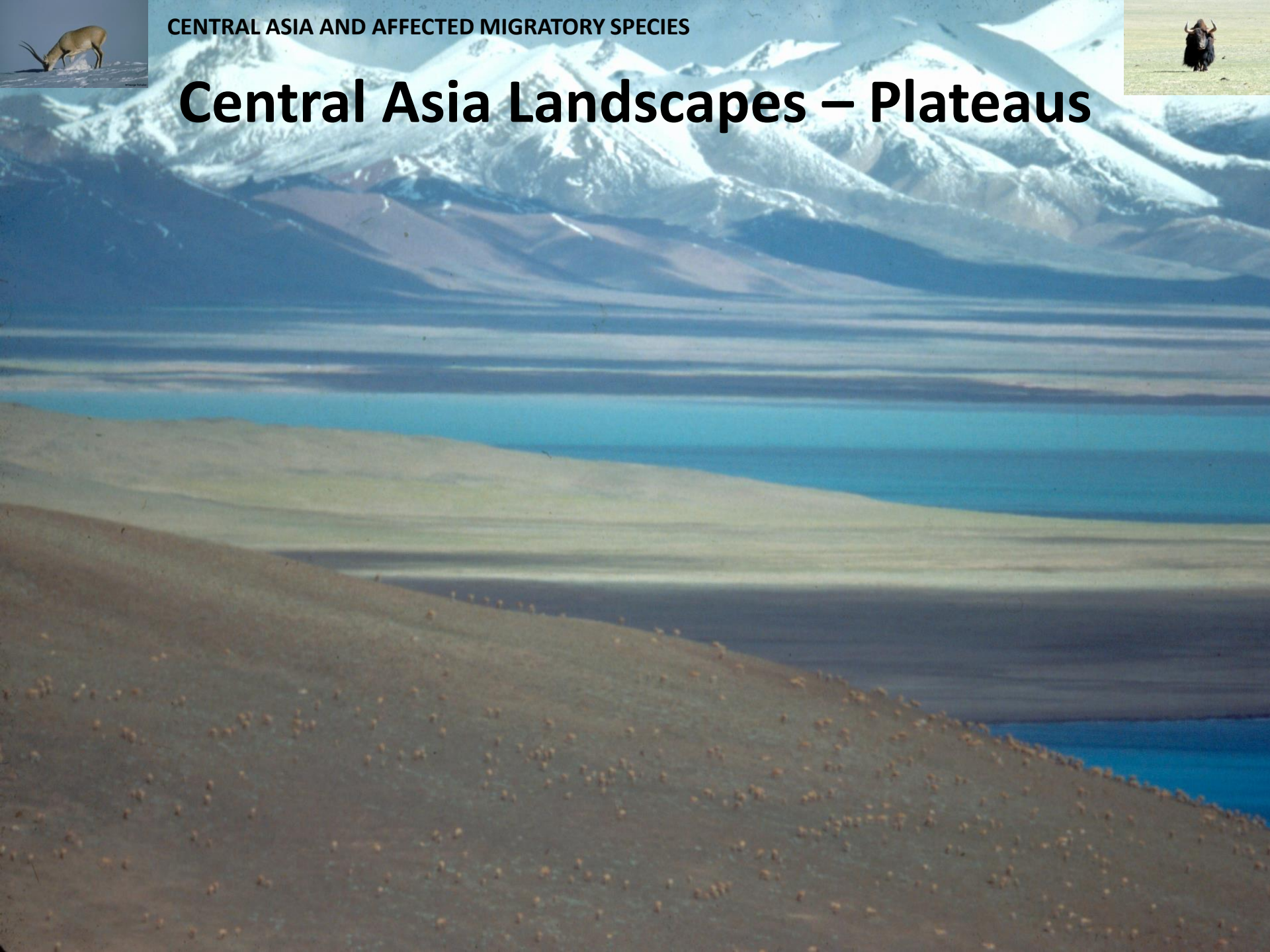


Central Asia Landscapes – Mountains



CENTRAL ASIA AND AFFECTED MIGRATORY SPECIES

Central Asia Landscapes – Plateaus



Vast Spatial Scale



Eastern Steppe

250,000 km²



Range of individual gazelle

25,000 km²+

Greater Yellowstone Ecosystem

108,000 km²



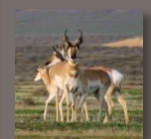
US National Grassland Reserves

Serengeti-Mara Ecosystem

25,000 km²



15,378 km²



CENTRAL ASIAN MIGRATORY MAMMALS



Snow leopard (*Uncia uncia*)
CMS Appendix 1



Saiga antelope (*Saiga borealis*)
CMS Appendix 2



Argali (*Ovis ammon*)
CMS Appendix 2



Goitered gazelle (*Gazella subgutturosa*)
CMS Appendix 2



Mongolian gazelle (*Procapra gutturosa*)
CMS Appendix 2



Bactrian camel (*Camelus (bactrianus)*)
CMS Appendix 1



Wild yak (*Bos grunniens/mutus*)
CMS Appendix 1



Kiang (*Equus kiang*)
CMS Appendix 2



Khulan (*Equus hemionus*)
CMS Appendix 2



Tibetan antelope (*Pantholops hodgsonii*)



Linear infrastructure that can affect wildlife



- Roads
- Fences
- Rail lines
- Canals & irrigation ditches



- Oil and natural gas distribution lines
- Power and communication lines





General impacts of linear infrastructure

- Habitat fragmentation
 - Habitat dissection
 - Habitat conversion or loss
 - Compression
 - Sedentarization
- Partial barriers
- Indirect effects
- Cumulative impacts





General impacts of linear infrastructure

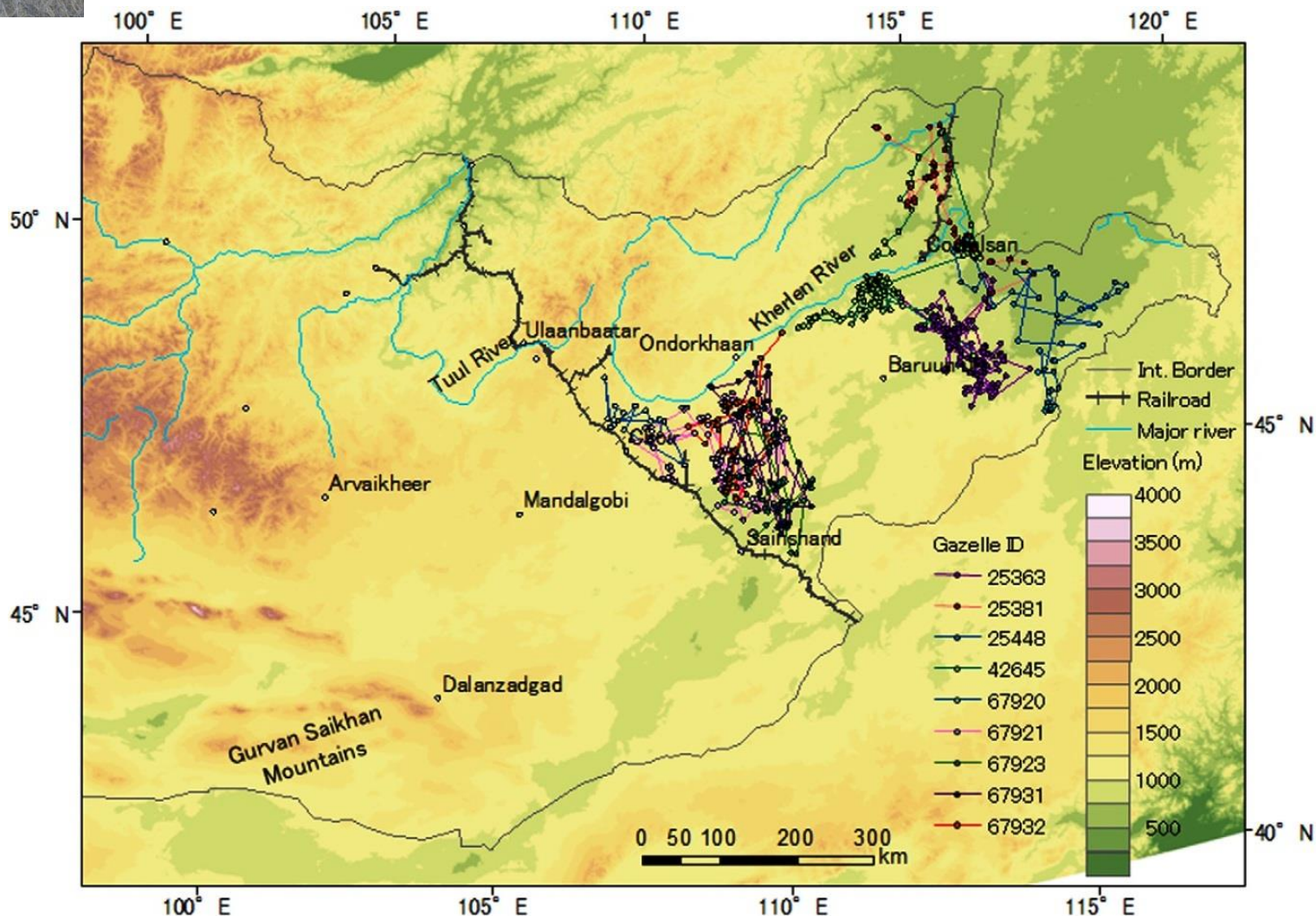
Potential Impact	Roads	Rail Lines	Pipelines	Fencing
Wildlife strikes	High	Medium	Low	Not applicable
Entanglement/trap mortality	Not applicable	Not applicable	Low	High
Habitat fragmentation	High	High	Low	High
Altering behavior	High	High	Low	High
Barrier to movement	High	High	Low	High
Altering use of habitat	High	High	Low	High
Increased human presence	High	Medium	Medium	Not applicable
Increased hunting	High	Low	Low	Not applicable
Conduits for invasive alien species	High	High	Low	Not applicable
Effects on population genetics	High	High	Low	High
Air pollution	High	Low	Not applicable	Not applicable
Altering natural processes	Low	Low	Low	High
Changed discharges in water bodies	High	High	Medium	Not applicable

Relationship rating: high - ■ medium - ■ low - ■ not applicable -



LINEAR INFRASTRUCTURE AND ITS IMPACTS

The Mongolian Gazelle Example



Alter behavior

Cut off access to resources

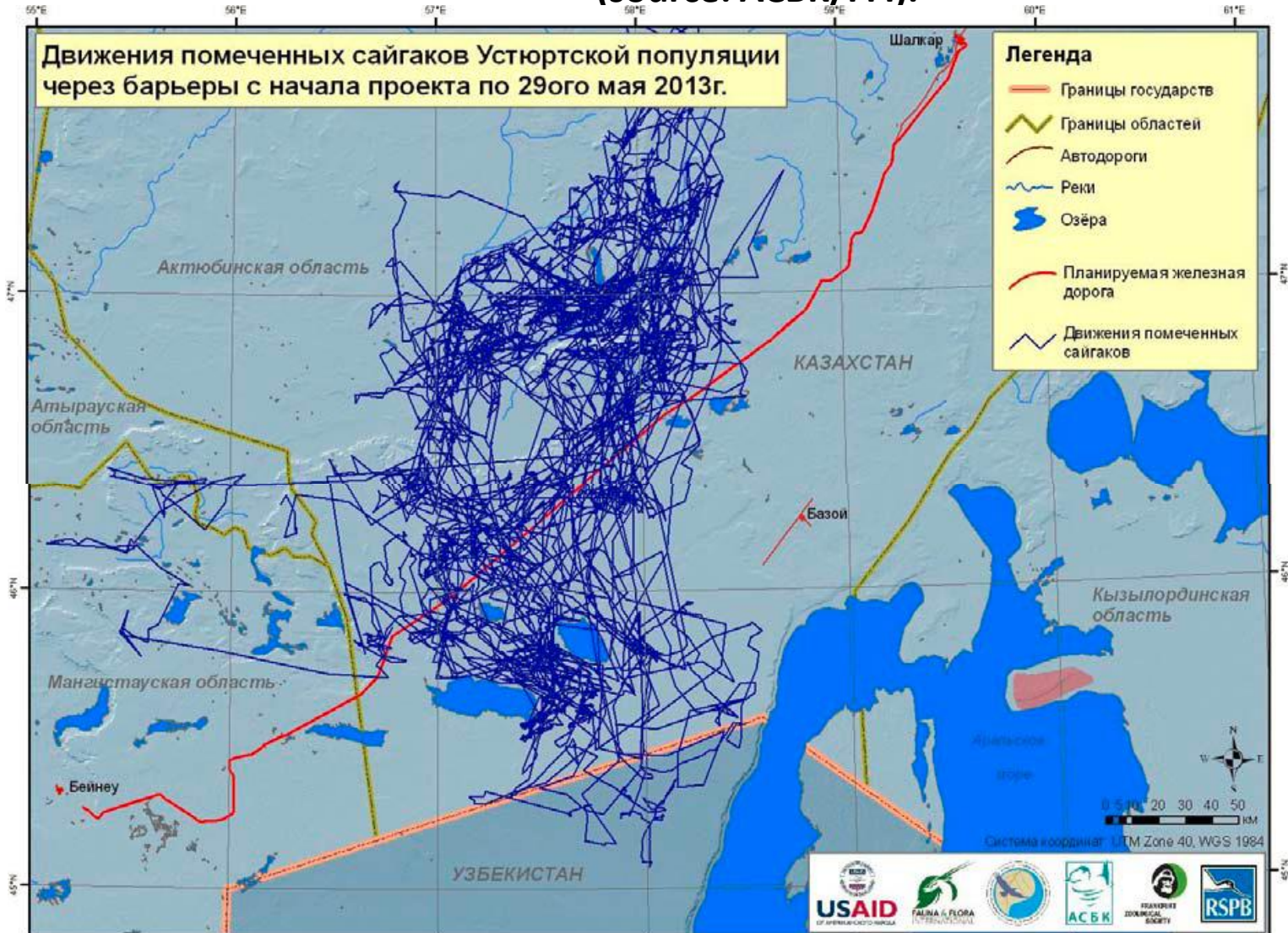
Split populations



LINEAR INFRASTRUCTURE AND ITS IMPACTS

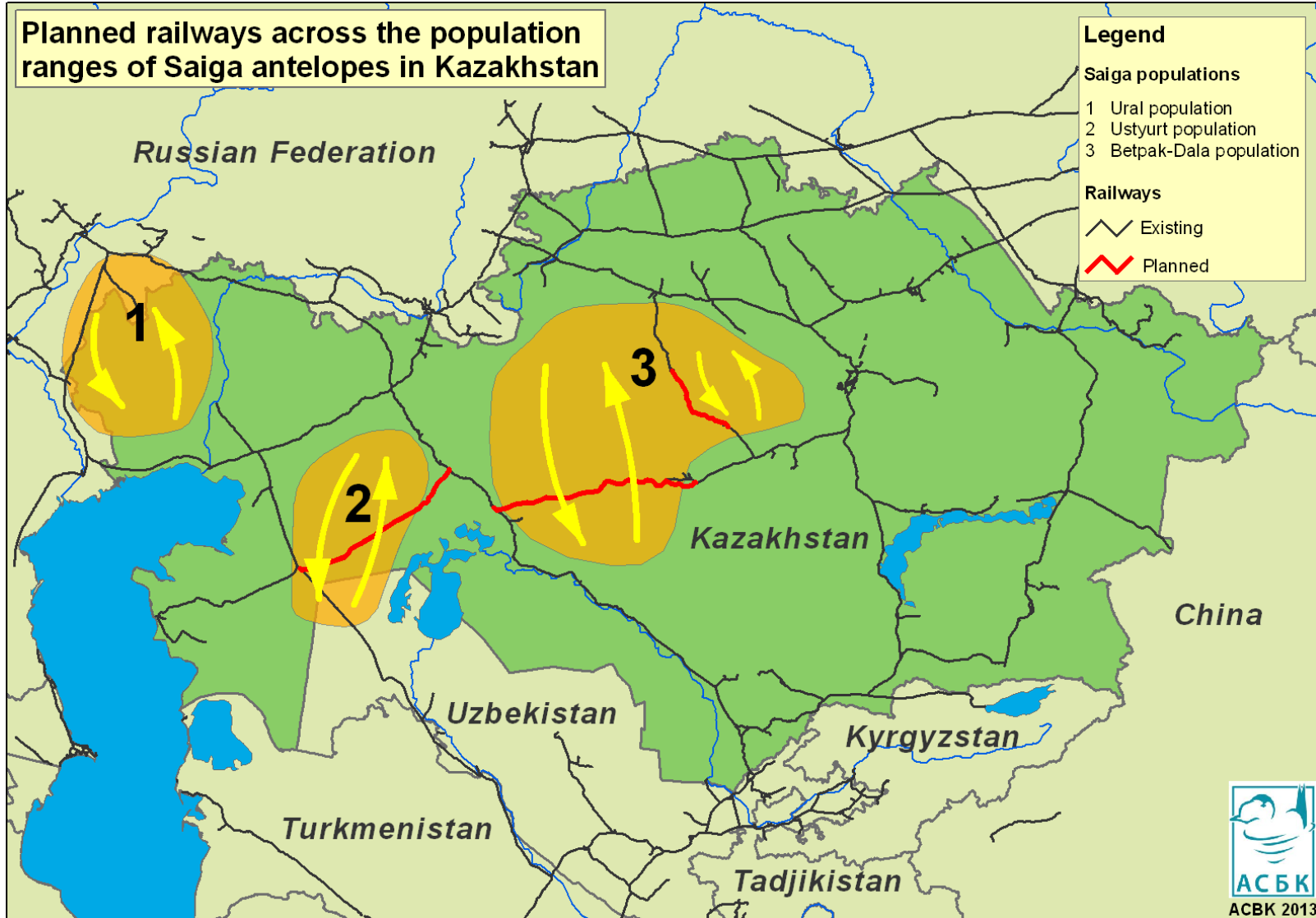
Saiga Antelope and Fences

Movement tracks of saiga fitted with GPS tracking devices within the Ustyurt saiga range prior to the construction of the border fence (source: ACBK/FFI).





Saiga Antelope and Railways





Guideline Principles

- **Mitigation**
 - Mitigation hierarchy
 - Species specific
 - Place specific
 - Durability
- **Assessments**
 - Multi-stakeholder participation
 - Screening, scoping
 - Cumulative and secondary effects
 - Climate change
- **Planning and design**
 - General Principles
 - Inter-agency coordination
 - Landscape view
 - Strategic planning processes
 - Species of interest and movement identification
- **Construction standards & solutions**
 - Construction practices
 - Wildlife fencing
 - Overpasses and underpasses
 - Influencing driver behavior
 - Influencing animal behavior
- **Monitoring and Evaluation**



WHAT THE GUIDELINES SAY

Overpasses and underpasses





WHAT THE GUIDELINES SAY

Wildlife-friendly fences





OTHER CMS GUIDELINES

CMS Saiga Crossing Options

Guidelines and Recommendations
to Mitigate Barrier Effects of
Border Fencing and Railroad
Corridors on Saiga Antelope in
Kazakhstan



A. Lushchekina

Saiga Crossing Options

Guidelines and Recommendations to Mitigate
Barrier Effects of Border Fencing and Railroad
Corridors on Saiga Antelope in Kazakhstan.



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INTERNATIONAL LEVEL:

Lender Standards & International Agreements

- International Finance Corporation (IFC) **Performance Standards**
- World Bank (WB) **EIA Policy**
- European Bank for Reconstruction and Development (EBRD) **Environmental and Social Policy**
- Asian Development Bank (ADB) **Safeguard Policy Statement**
- CMS
- Espoo Convention
- Kiev Protocol
- European Agreement on Main International Traffic Arteries



NATIONAL LEVEL:

SEAs and EIAs as tools for planning

These instruments examine potential impacts caused by proposed actions and ensure enough data and analysis are available to support sound decision-making.

Strategic environmental assessments: require the review of ‘strategic’ processes such as policies, plans, and programs.

Environmental impact assessments: most common legally mandated tool for reviewing **individual projects** and identifying mitigation measures. Entirely process-oriented, and not outcome-oriented.



Strategic Environmental Assessment components by country

Component Type		Kazakhstan	Kyrgyzstan	Tajikistan	Turkmenistan	Uzbekistan	Mongolia	China	Russia
Impact-Centered									
1	Plans (including feasibility studies, mapping, and zoning)	not referenced	not referenced	not referenced	not referenced	not referenced	not referenced	not referenced	referenced
2	Programs (referencing development of any type)	not referenced	not referenced	not referenced	not referenced	not referenced	not referenced	referenced	referenced
3	Policies (including international agreements, laws, regulations, standards, and guidelines)	not referenced	not referenced	not referenced	unclear	unclear	not referenced	referenced	referenced
4	Mentions linear infrastructure (including any specific reference to roads, rail lines, pipelines, or fences)	referenced	referenced	unclear	referenced	referenced	referenced	referenced	referenced
5	Mentions natural resources	not referenced	not referenced	not referenced	referenced	not referenced	referenced	not referenced	referenced
6	Mentions wildlife (using the term fauna, wildlife, animal, or other equivalent)	not referenced	referenced	referenced	referenced	referenced	referenced	referenced	referenced

Legend: referenced not referenced unclear



Environmental Impact Assessment components by country

Component Type		Kazakhstan	Kyrgyzstan	Tajikistan	Turkmenistan	Uzbekistan	Mongolia	China	Russia
1	Includes transboundary Impacts	referenced	referenced	referenced	not referenced	not referenced	not referenced	not referenced	referenced
2	Mentions roads (referencing any type such as motorways, highways, transportation corridors, etc)	referenced	referenced	not referenced	not referenced	referenced	not referenced	not referenced	not referenced
3	Mentions rail lines (using terms such as railways, railroads, rail corridors, transportation corridors, etc)	referenced	referenced	not referenced	not referenced	referenced	not referenced	not referenced	not referenced
4	Mentions pipelines (in reference to oil, gas, and water pipelines)	referenced	referenced	not referenced	not referenced	referenced	not referenced	not referenced	referenced
5	Mentions fences (whether border, livestock, or used in connection with transportation corridors)	not referenced	not referenced	not referenced	not referenced	not referenced	not referenced	not referenced	not referenced
6	Mentions wildlife (using terms such as wildlife, animal(s) or animal resources, fauna, etc)	referenced	referenced	not referenced	not referenced	not referenced	referenced	referenced	referenced
7	Mentions migratory species	referenced	not referenced	not referenced	not referenced	not referenced	not referenced	not referenced	not referenced
8	Expressly requires consideration of migratory species during the construction of linear infrastructure .	referenced	not referenced	not referenced	not referenced	not referenced	not referenced	not referenced	not referenced

Legend: referenced not referenced



Key Considerations from the Guidelines

HIGHLY RECOMMENDED STEPS:

- Early use of mitigation hierarchy
- High level of understanding of species affected
- All forms of impact taken into account
- Same alignment for more than one linear infrastructure plans
- Engagement of all relevant stakeholders

PROHIBIT LINEAR INFRASTRUCTURE WHEN:

- Alternative locations have not been explored or considered in the design and planning process
- Wildlife-friendly designs are not incorporated
- Mitigation and compensation plans are not well considered



Summary of Recommendations

- It is urgent to incorporate impacts on migratory species into both SEA and EIA processes.
- More specificity is needed on avoidance and mitigation plans.
- Need to formalize and harmonize practices to ensure that migratory species are considered at appropriate stages of planning and development.



Thank you for your attention



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