Wildlife conservation along road and railway
-Case study in China

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汇报内容

Problems  Measures  Cases
1. Habitat degradation/loss
2. Habitat fragmentation
3. Habitat improvement
4. Road kill
5. Block or avoid
1. **Avoid:** Route selecting

2. **Mitigation:** Design for Wildlife crossing structures

3. **Monitoring:** Construction and operation

Throughout the whole process of highway project
Case 1: National Highway cut through Northeast Tiger Leopard National Park
Tiger and leopard cross road frequently.
Route selecting: **Make full use of** the old road within National Park

Design for Wildlife crossing structures: 3 WCSs for *Siberian Tiger* and *Amur Leopard*

90 million RMB

Construction and operation: **ongoing**

monitoring is important

（国家林业局猫科动物研究中心国道丹阿公路吉林省界至东宁段改扩建工程建设项目办，2018）
Construction stage: monitoring wildlife activity around the location of WCS by infra-red cameras

Research is ongoing
Case 2: Amphibian crossing structures along road in Changbai Mountain, northeast China
WCS for amphibian

1) Design for tunnel

- 2016-2018年长白山区野外控制性模拟试验；
- 400余只中国林蛙 (Chinese brown frog)，中华大蟾蜍 (Asiatic toad)，开展38组试验；

Culverts with a side length ≥ 1 m, lined with soil
WCS for amphibian

2) Gradient on the roadside ditch wall and height of guide drift fence

- 43组爬坡试验，36组跳跃试验；
- 800余只中国林蛙，中华大蟾蜍；

Height of fence ≥ 0.4 m  and gradient on the roadside ditch wall ≤ 45°
Pilot project: Heda expressway in Jilin Province
Case 3: Qinghai–Tibet road and railway cut through Sanjiangyuan National Park
Tibetan antelope migration was disturbed by road.
Overlapping and barrier effect—青藏高原公路和铁路对四种动物的叠加阻隔影响

- 2014-2019，5年动态监测
- 藏羚羊受影响大，其他三种典型物种影响不大

藏羚羊是线性基础设施叠加影响最受关注的物种
2006-2019年动态监测
道路影响域从200米（藏原羚）到1000米（野牦牛）不等
动物有适应交通干扰趋势（藏羚羊4年，藏原羚和藏野驴2年）
In the future: expressway

highway

railway

Route selecting: Keep expressway far away highway and railway in key section for avoiding overlapping impact on Tibetan antelope migration

(Wang et al, 2017)
Wildlife crossing structure

- 2014-2016
- 51 infrared cameras
- 14 small bridges, 11 culverts,
- 1 big bridge

(Wang et al, 2017; 2018)
Tibetan antelope crossing bridge

青藏公路藏羚羊通道桥（20m*15 piers）

Height: 3-5m, Width: 300m; Length: 10m

2016-2019年监测显示，藏羚羊通道桥利用率逐渐上升（估计每年有25%的提升）
Tibetan antelope was most (62.97%), following are Tibetan gazelle, kiang, fox, wolf;

Tibetan antelope used all piers, most crossing located Number 4, 8, 10-13 pier
## Wildlife crossing structure

### Tibetan antelope, Tibetan gazelle, Kiang, etc

<table>
<thead>
<tr>
<th>Species</th>
<th>Openness Index</th>
<th>Width</th>
<th>Height</th>
<th>Population Type</th>
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<td>&gt; 6 m</td>
<td>&gt; 5 m</td>
<td>Migration population</td>
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<tr>
<td></td>
<td>&gt; 4.2</td>
<td></td>
<td></td>
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<tr>
<td>Kiang</td>
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<td>&gt; 3 m</td>
<td>&gt; 3.5 m</td>
<td>Non-migratory population</td>
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<td>Wild yak</td>
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**Note:** Road Width is 10m
Thank you for your attention!
Any questions?

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