

附录4 道路对野生动物四大类影响的国际对比

Appendix 4 International comparison of the four major impact categories of roads on wildlife

影响形式 Impact categories	国内研究现状 Research status in China	代表性文献 Representative references	国际研究现状 Research status in the western countries	代表性文献 Representative references	差距 Research gap
栖息地影响 Impact on habitat	研究较少 Less research	Wang et al, 2012; Li et al, 2010a; Clauzel et al, 2015	研究较多 More research	Forman, 2003; Torres, 2016; Riitters & Wickham, 2003; Ibisch et al, 2016	研究数量少 The number of studies is small
	多为直接计算栖息地损失面积和比例 Most studies directly calculate the habitat loss area and proportion		将栖息地损失面积和野生动物种群相关联 Correlated habitat loss area and wildlife populations		缺乏将栖息地损失和退化与目标物种的活动相互关联的研究 Lack of studies linking habitat loss and degradation with the activities of the target species
	利用景观生态学指数计算破碎化程度 Some studies using the landscape ecological index to calculate the degree of fragmentation.		全球、洲际、跨国的破碎化程度评价, 将破碎化程度与野生动物受威胁程度相关联 Some studies evaluated the fragmentation degree of global, intercontinental and transnational scale, and correlated the degree of fragmentation with the threat of wildlife		缺乏将破碎化程度与目标物种保护成效相互关联的研究 Lack of studies correlating the degree of fragmentation with the conservation effectiveness of the target species.
对野生动物活动的影响 Impact on the movement of wildlife	研究较少 Less research	Lian et al, 2012; Dai et al, 2011; 龚明昊等, 2012; Li et al, 2017; He et al, 2019; Kang et al, 2020; Xie et al, 2021; 王云等, 2021	研究较多 More research	Van et al, 2015; Ceia-Hasse et al, 2017	研究数量相对少 The number of studies is small
	多采用红外相机、痕迹法调查路侧动物活动特征, 判断交通干扰程度 Most studies using infrared camera and track method to investigate the activity characteristics of roadside animals and quantify the degree of traffic interference;		多采用GPS遥测项圈、痕迹法、红外相机、遗传多样性分析等方法, 判断交通干扰程度; Most studies using GPS collaring, track methods, infrared cameras, DNA methods to evaluate the impact of traffic on wildlife		研究方法单调, GPS遥测项圈和DNA分析的研究很少 The method is monotonous, and few studies on GPS telemetry collar and DNA analysis

	<p>多关注兽类, 尤其是保护动物, 如大熊猫、藏羚等 Most studies focus on mammals, especially protected species, such as giant pandas, Tibetan antelopes, etc.</p>		<p>对兽类、鸟类、爬行类、两栖类都开展了较多的研究 More research has been carried out on mammals, birds, reptiles and amphibians.</p>		<p>对鸟类、两爬类关注较少 Studies on birds, amphibians and reptiles are relatively less.</p>
	<p>2005年发表了我国首个动物通道案例研究论文(青藏铁路) The first case study paper on WCSs was published in 2005 in China(Qinghai-Tibet railway)</p>		<p>1955年美国首个动物通道建成, 1974年欧洲首个动物通道建成 The first WCS in USA was completed in 1955, and the first WCS in Europe was completed in 1974</p>		<p>研究起步晚, 研究数量相对少 Studies started late and the number of studies was relatively small</p>
<p>对野生动物通道的研究 Research on wildlife crossing structures</p>	<p>主要关注利用通道的种类、数量、影响因素等 Focus on species, number, impact factors using the WCSs;</p> <p>研究方法主要是痕迹法、现场观测、红外相机等 The research methods of most studies were track methods, field surveys, infrared cameras, etc.</p>	<p>Zhang et al, 2019; Hu et al, 2020; Wang et al, 2019; Wang et al, 2018; Zhang et al, 2010; PAN et al, 2009; 裘丽和冯祚建, 2004</p>	<p>除了关注穿越通道的动物种类、数量、影响因素等, 还从景观连通性角度评估通道的有效性 Except for focusing on species, number and impact factors using WCSs, some studies evaluated the effectiveness of WCSs from the perspective of habitat connectivity</p> <p>研究方法与我国类似 The research methods were similar whether in foreigner countries or in China.</p>	<p>Clevenger &amp; Huijser, 2011; Beckmann et al, 2010; Van et al, 2015; Denneboom et al, 2021</p>	<p>研究过于关注动物通道利用率的监测, 缺乏从维持道路两侧种群的稳定性角度的分析 Most studies focus on monitoring the utilization of WCSs and lack an analysis from the perspective of maintaining the stability of populations on both sides of the road.</p>
<p>道路交通伤害 Roadkill</p>	<p>研究较少 Less research 2007年开始系统研究(长白山) The most comprehensive study was started in Changbai Mountain in 2007</p>	<p>朴正吉等, 2012; Gu et al, 2011; Wang et al, 2013; Zhang et al, 2018</p>	<p>研究较多 More research 20世纪30年代开始发表学术论文, 至今全球十多个网站系统收集道路交通伤害信息 Scientific papers were published in 1930<sup>th</sup> and presently more than 10 website to specifically collect roadkill data in the world;</p>	<p>Forman, 2003; Van et al, 2015; Waetjen &amp; Shilling, 2017; Chyn et al, 2019</p>	<p>研究起步晚, 研究数量较少 Studies started late and the number of studies was relatively small</p>

<p>研究方法主要是科研人员沿路调查 The research method mainly was field survey along roads by scitific researchers</p>	<p>数据来源广泛, 不仅科研人员, 更有交通部门、志愿者、野生动物爱好者等 There are a wide range of data sources, not only researchers, but also transportation departments, volunteers, and wildlife enthusiasts etc 已经建立全球道路交通伤害网站 : <a href="https://globalroadkill.net/">https://globalroadkill.net/</a> Presently global roadkill network has been formed, <a href="https://globalroadkill.net/">https://globalroadkill.net/</a>;</p>	<p>数据来源单一, 未建立基于公民科学的数据收集平台, 无法为交通部门和野生动物保护部门提供科学依据 The data source is single, and there is no data collection platform based on citizen science, which cannot provide scientific basis for the transportation departments and wildlife protection departments</p>
<p>主要关注道路交通伤害的种类、数量、时空分布特征、影响因素等内容 Focus on roadkill species, number, spatial and temporal distribution and impact factors, etc</p>	<p>不仅关注交通伤害的基本信息, 更关注对野生动物种群稳定性影响, 采用模型对未来发展趋势进行预测等 Not only focus on basic information of roadkill, but also attach importance on the impact of roadkill on population stability, and furthermore predict the development tendency of roadkill.</p>	<p>目前仅关注交通伤害本身的基本指标, 对伤害与动物种群稳定性、交通伤害发展趋势的预测方面缺乏研究 Presently most studies only focus on the basic indicators of roadkill, and lack of research on the relationship between roadkill and population stability, and the development trend of roadkill.</p>

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