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第五辑

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前沿观察

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人鸟互动神圣性与鸟类成功保护的关联性研究：以俄罗斯北极与中国之间鸟类迁徙路线为例

［美］福尔克·惠特曼
（丁海彬　译）

摘要：大多数鸟类都是候鸟，它们飞越不同的行政边界、国家和文化区域。在迁徙路线上的各个国家都遇到了一个难以解决的问题，即如何以优渥、可行和可持续的方式应对和管理候鸟。本文探讨在俄罗斯北极地区和中国之间鸟类生态迁徙区域中一个被广泛忽视的治理概念——神圣性（Huettmann 2020）。许多土著人已经在过去数千年成功地使用了神圣性概念。这一概念通常与善意禁忌有关，如提倡尊重、承认限制、与生物及非生物世界的统一性。本文证明了迁徙路线上许多候鸟业已受惠于神圣性概念。然而由于治理失败，该迁徙路线的鸟类现在却正在减少，虽然合理的所谓现代治理计划在过去40年中急剧增加（但却以牺牲地球母亲相关的精神治理计划为成本）。我倡导将鸟类及野生动物的神圣性因素纳入保护治理之中，这一成本效益高、传播范围广的理念，可以帮助我们重新获得更加可持续的基于地球及其生物和非生物生境特征的人鸟关系。

关键词：北极　人鸟关系　神圣性　全球可持续性　迁徙物种　环球迁徙路线

作者简介：福尔克·惠特曼，阿拉斯加大学费尔班克斯分校生物与野生动物学系。

译者简介：丁海彬，聊城大学国际教育交流学院副教授。

On the Relevance of Spirituality for Human-Bird Interactions and Conservation Success: An example from the Arctic Russia-China Flyway

Falk Huettmann

Abstract: Most birds are migratory and they fly across administrative boundaries, nations and cultures. This creates a still widely unresolved problem for governance regimes across the spectrum to cater and manage it in a good, feasible and sustainable manner. To provide progress here I review a widely overlooked management concept - Spirituality (Huettmann 2020) - for the ecological flyway region between Arctic Russia and China. Many indigenous people have used spiritual concepts for millennia successfully, often associated with "good" taboos, e.g. a promoted respect, acknowledged limits and unity with the living and non-living world. Here I show that many relevant migratory bird species on the flyway are affected by spirituality, and that birds on that flyway are now in decline due to a failed governance while its rational and so-called modern management schemes were dramatically on the rise last 40 years (but done on the costs of spiritual management schemes that otherwise respects Mother Earth). I promote to include spiritual aspects of birds and wildlife for conservation management as a cost-effective and wide-spread concept to re-gain a more sustainable bird-human relationship for the earth, its living and non-living habitat features.

Keywords: Arctic, Bird-Human relationship, Spirituality, Global Sustainability, Migratory Species, Global Flyways

About the author: EWHALE lab, Inst of Arctic Biology, Biology & Wildlife Department, University of Alaska Fairbanks UAF

许多鸟类在行政边界、国家和文化区域之间迁徙（Berthold 1996，关于北极与亚洲相关鸟类，请参见 Alerstam et al. 2001，2008；Jiao et al. 2016；Prins and Namgali 2017）。即使在全球化和现代国际治理计划时代，这也为大多数现有的治理体系提出了较为难解的行政保护问题（Boardman 2006）。由这些问题判断——事实亦然——现代人类缺乏好的榜样模式以应对迁徙鸟类和野生动物问题。有许多例子表明事实确实如此（Wilcove 2008；Huettmannet al. 2011，2016，关于环极地迁徙海鸟和太平洋北极地区）。大多数候鸟——鸣鸟、滨鸟、猛禽、水禽和海鸟——总体上呈下降趋势，其栖息地丧失，经常被侵占，甚至被铺上混凝土（Huettmann et al. 2016；Aharon-Rotman et al. 2016；Jackson et al. 2020）。这些都体现了西方世界在鸟类和栖息地保护、保护治理、可持续性目标（如联合国持续几十年的做派）方法上存在着重大问题，并且这些问题已完全嵌入经济范式中（Huettmann et al. 2011 综述；制度化的经济增长政策请参见 Rich 2013；一鸟类示例请参见 Resendiz-Infante and Huettmann 2015）。因为发展、现代化和金钱利益，受保护的圣地及其物种终被抛弃（Altvater 2008；The Guardian 2020；有关保护区的信息，请参见 Yen et al. 2005；Gailus 2010）。北极及其野生动物（Krupnik 2018），包括鸟类（见 Banerjee 2012 及其引文），情况也是如此。这些物种通常与全世界的热带地区关联（Zoeckler 2013；有关勺嘴鹬请参见 Zoeckler et al. 2016；有关西伯利亚鹤请参见 Huettmann et al. 2018；有关中俄雀形目请参见 Jiao et al. 2016）。

根据教科书，这些地区和迁徙路线应采取科学管理措施，以维持现状和更好状态，如同西尔维（Silvy 2012）和利奥波德（Leopold 2012）所示。相反，针对西方世界主导但普遍失败的关于人鸟关系及鸟类保护的方案，我提出一种替代方案：神圣性（如 Lama 2005；Huettmann 2020；深生态学请参见 Naess 1989，盖亚理论请参见 Lovelock 2016）。这是一个在北极以及整个世界及原住民族群中普遍存在的概念（Hindu Kush-Himalaya 请见 Huettmann 2020），但迄今为止，此概念尚未广泛使用甚至被边缘化（有关案例请参见 Li et al. 2014，Hansen and Huettmann 2020。有关基于科学的方法请参见 Georgescu-Roegen 1971；Lama 2005；Carlson 2012；Lovelock 2016）。神圣性概念得之虽易，且广泛植根于人类心中，但令人惊讶的是，在西方财政主导的治理和科学体系及其从业者中却无迹可寻（Silvy 2012）。相反，西方科学体系却运用科学、经济与技术与之背道而驰，大多落得个衰败结局（如 Czech et al. 2000）。而古代自然界、野生动植物——特别是鸟类——及其内在价值

Many birds are migratory flying across administrative boundaries, nations and cultures (Berthold 1996, for Arctic and associated Asian birds see Alerstam et al. 2001, 2008, Jiao et al. 2016 and Prins and Namgali 2017). This presents an unresolved administrative conservation problem for most governance systems in place (Boardman 2006), even in times of globalization and modern international governance schemes. Judged by these problems, and in reality, modern human kind has no good role model to approach migratory birds, and wildlife. There are many examples that show us no other (Wilcove 2008, Huettmann et al 2011, 2016 for circumpolar migratory seabirds and the Pacific Arctic). The fact that most migratory birds - songbirds, shorebirds, raptors, waterfowl and seabirds alike - are on the general decline and habitats getting lost and consumed - paved over by concrete (Huettmann et al. 2016, Aharon-Rotman et al. 2016, Jackson et al. 2020) - show substantial governance problems with the classic, western-world approach to bird and habitat, conservation management, sustainability goals (e.g. applied for decades by the United Nations UN https://sdgs.un.org/goals), and all being fully embedded in the economic paradigm (Huettmann et al. 2011 for a review; see Rich 2013 for institutionalized Economic Growth policies, and Resendiz-Infante and Huettmann 2015 for an avian example). Protected holy sites and their species are given up on the shrine of development, modernity and money (Altvater 2008, The Guardian 2020; see Yen et al. 2005, Gailus 2010 for protected areas). This is also and specifically the case for the Arctic and its wildlife (Krupnik 2018) including birds (see Banerjee 2012 and citations within). These species are usually connecting with the tropics worldwide (Zoeckler 2013; for Spoonbilled Sandpipers see Zoeckler et al. 2016; see Huettmann et al. 2018 for Siberian Cranes; and Jiao et al. 2016 for passerines for China-Russia).

According to textbook, those regions and flyways are to be maintained -status quo and better - with a science-based management, e.g. Silvy (2012), Leopold (2012). Instead, here I present an alternative approach to the dominating but widely failing western world scheme on how humans relate with birds towards their conservation: Spirituality (e.g. Lama 2005 and Huettmann 2020; see also Naess 1989 for Deep Ecology, and Lovelock 2016 for GAIA theory). It is a concept that is commonly found in the Arctic and throughout the world and its indigenous people (see Huettmann 2020 for the Hindu Kush-Himalaya). However, it is widely not made good use of and marginalized, thus far (see Li et al. 2014 and Hansen and Huettmann 2020 for examples; see Georgescu-Roegen 1971, Lama 2005, Carlson 2012 and Lovelock 2016 for a science-based approach). It comes as no costs, is widely entrenched among humans, but is surprisingly absent in western- and financially dominated governance and science systems and their practitioners (Silvy 2012). The latter has actually promoted against it, using science, economy and technology instead, but achieved mostly decay (e.g. Czech et al. 2000). Instead, ancient nature, wildlife, and specifically birds and their inherent value, are widely appreciated

却在世界范围内得到了广泛的赞赏和尊重（见 Carlson 1962；Diamond and Filion 1987），这在大多数关于大自然——包括鸟类——的宗教和神圣性方法中都得到了很好的体现（全球鹤类见 Matthiessen and Bateman 2001；新热带地区示例请参见 Krech 2009）。

原住民已经在地球上生活了很长时间，他们通常珍视和欣赏鸟类，这一事实可以在他们的特定记录中找到，例如口述历史、传统生态知识以及长者记录（Catlin and Matthiessen 2004；Krech 2009；定义见 Suzuki and Knudson 1993）。在与亚洲迁徙路线相关联的北极鸟类和生态系统中也发现了这一现象（Krupnik and Jolly 2006；Prins and Namgali 2017）。

我在此处介绍的神圣性层面涉及迁徙路线保护，此路线连接着俄罗斯北极、阿拉斯加、中国、整个东南亚以及澳大利亚和塔斯马尼亚岛（研究区域详细信息和论据请见下文和 Jiao et al. 2016）。

俄罗斯北极—中国迁徙路线的基本特征

本文讨论的迁徙路线覆盖世界主要经济体的 20 多个国家和地区，包括俄罗斯、美国阿拉斯加、中亚、中国、日本、澳大利亚、中国台湾，以及多个海洋和岛屿，例如阿留申群岛、千岛群岛和许多太平洋岛屿。它通常被称为东亚—澳大利亚路线，但我们的研究领域涵盖了一些由更广生态所维系的不同方面，如 Jiao et al. 所述（2016 年“中国东北—俄罗斯路线”；另见 Beiring 2013）。首先，我们重点关注这一迁徙路线的陆地因素及其从高北极地区一直延伸到南至塔斯马尼亚岛的毗邻生态区域。这样做是为了在生态学上满足“俄罗斯—中国”地区候鸟栖息地与迁徙路线并涵盖更清晰的研究视角。

俄罗斯北极—中国广泛迁徙路线神圣性和相关信仰系统示例

表 1　俄罗斯—中国迁徙路线信仰系统及其特征概述（定义见 Jiao et al. 2016）

迁徙路线上信仰系统及区域覆盖	起源	引用 / 参考	保护	受影响候鸟
印度教（广泛传播）	印度	Knott（2016），Lama（2012）	尊重动物和存在；许多神和鬼存在，并且要受到尊重	许多迁徙物种在印度、孟加拉国和邻近地区过冬

and respected throughout the world (see Carson 1962, Diamond and Filion 1987). This is well reflected in most religions and spiritual approaches to nature, its birds included (Matthiessen and Bateman 2001 for the world's cranes; see Krech 2009 for an example within the neotropics).

Indigenous people have been on earth for long times and they usually valued and appreciated birds, and this fact is found in their specific record, e.g. oral history, traditional ecological knowledge and with "elders" (Catlin and Matthiessen 2004, Krech 2009; for definitions see Suzuki and Knudson 1993). That is also found in Arctic birds and ecosystems that connect with Asian flyways (Krupnik amd Jolly 2006, Prins and Namgali 2017).

Here I present on some spiritual aspects for the conservation of the flyway connecting the Arctic of Russia and Alaska with China and further south throughout Southeast Asia all the way to Australia and Tasmania (study area details and justifications provided further below and in Jiao et al. 2016).

Basic characteristics of the Arctic Russia-China flyway

The flyway described here is shown in Figure 1. It consists of a globally connecting system covering over 20 nation states including world-dominating economies like Russia, Alaska-U.S., Central Asia, China, Japan, Australia, Singapore and several oceans and islands like the Aleutians, Kuriles and numerous Pacific islands. It's often referred to as the East Asian-Australasian Flyway but our study area covers some different aspects linked by the wider ecology, as described by Jiao et al. (2016 "Northeast China-Russia flyway"; see also Beiring 2013). Primarily we focus on the continental aspects of this flyway and its ecologically adjacent regions reaching from the high Arctic as far as south as Tasmania. That is done to cater ecologically the habitats and connections of migratory birds in that region "Russia-China" and to be more inclusive for a more precise perspective.

Examples of Spirituality and associated Belief Systems along the wider Arctic Russia-China flyway

Table 1 Overview of a selection of Belief Systems and their characteristics along the Russian-China flyway (as defined in Jiao et al. 2016)

Belief System and area coverage on the flyway	Origin	Citation/ Reference	Conservation Aspect	Migratory birds affected
Hinduism (wide-spread)	India	Knott (2016), Lama (2012)	Respect animals and the being; many gods and ghosts exist and are to be respected	Many migratory species wintering in India, Bangladesh and adjacent areas

（续表）

迁徙路线上信仰系统及区域覆盖	起源	引用 / 参考	保护	受影响候鸟
佛教（广泛传播）	尼泊尔	Keown（2009），Xiaoming Z（2004），Lama（2012）	整体观点	许多迁徙物种经过尼泊尔、印度、东南亚
宗派，比如盂兰盆会（地方性的）	尼泊尔（中国）西藏	Karmay and Watt（2007）	与更广阔宇宙的联系	许多迁徙物种经过蒙古，尼泊尔，（中国）西藏
耆那教（地方性的）	喜马拉雅地区	Lama（2012）	非暴力，无占有，与宇宙相连	许多迁徙物种经过尼泊尔、（中国）西藏和印度北部
道教（广泛传播）	中国（山区）	Hoff（1983，1993），Miller，（2003）Silvers（2005）	整体观点	许多迁徙物种在黄海停留或过冬
萨满教与异教徒（出现率低但广泛传播）	全部路线	Davis（2011），Lama（2012）	与宇宙相连，更广泛的整体观点	许多迁徙物种在鄂霍次克海、日本海和蒙古、（中国）西藏、尼泊尔停留或过冬
里山里海（原风景）（Satoyama-Satoumi）（日本）	日本	Duraiappah et al.（2012）	更广泛的整体概念，包括动物、景观以及大气和宇宙	日本迁徙和过冬物种
伊斯兰教（区域）	局部发生，广泛传播	Diamond（1999），Harari（2015）		
基督教（地方化）	大多在城市	Diamond（1999），Harari（2015）		利用城市和城市地区的迁徙物种
无神论（广泛传播）	广泛且呈上升趋势	Belgrano and Fowler（2011）	一种纯粹非宗教的理性方法	国际迁徙路线上的迁徙物种
自然主义	丰富，被“西方”广泛推广	Carson（1962）Leopold（2012）	顾及鸟类，小规模饲养，作为“西方”治理计划的边缘部分	迁徙物种政策，以及西方援助、发展和持续发展目标（SDVG）

许多民族和文化在此复杂路线上一一呈现。表 1 列出了此路线上一些主要宗教，包括细节描述。

一些鸟类路线和广阔的领域将北极与越冬场相连。通常，北极地区长久以来就有人类——原住民——居住，因此他们关于“地球母亲”的信仰体系

(continued)

Belief System and area coverage on the flyway	Origin	Citation/ Reference	Conservation Aspect	Migratory birds affected
Buddhism (wide-spread)	Nepal	Keown (2009), Xiaoming Z (2004), Lama (2012)	Holistic perspectives	Many migratory species passing by in Nepal, India, SE Asia
Sects, e.g. Bon (local)	Nepal, Tibet	Karmay and Watt (2007)	Connections with the wider universe	Many migratory species passing by in Mongolia, Nepal, Tibet
Jainism (Jain Dharma) (local)	Himalaya region	Lama (2012)	Non-violence, non-possession, connected with the universe	Many migratory species passing by in Nepal, Tibet and Northern India
Daoism (wide-spread)	China (mountain region)	Hoff (1983, 1993), Miller, (2003) Silvers (2005)	Holistic perspectives	Many migratory species stopping-over or wintering in the Yellow Sea
Shamanism and Paginism (Low occurrence but wide-spread)	All over the flyway	Davis (2011), Lama (2012)	Connected with the universe, wider views, holistic perspectives	Many migratory species stopping-over or wintering in the Sea of Okhotsk, Sea of Japan and Mongolia, Tibet, Nepal
Satoyama-Satoumi (Japan)	Japan	Duraiappah et al. (2012)	Wider holistic concepts, including animals, landscapes and the atmosphere and universe	Migratory and wintering species for Japan
Islam (regional)	Local occurrence wide-spread	Diamond (1999), Harari (2015)		
Christianity (localized)	Mostly in cities	Diamond (1999), Harari (2015)		Migratory species using cities and urban regions
Atheism (wide-spread)	Widespread and on the rise	Belgrano and Fowler (2011)	A purely non-religious rational approach	Migratory species along international flyways
Naturalist	Abundant, widely promoted by "the west"	Carson (1962) Leopold (2012)	Consider birds and provide for them on a small occasion as a marginal part of the "western" governance scheme	Migratory species policy, and western aid, development and sustainabale development goals (SDVG)

Many nations and cultures can be found along this complex flyway. Some of the major religions are shown in table 1 with details described within.

Several bird flyways and broad fronts exist connecting the Arctic with the wintering grounds. Usually the Arctic areas include humans - indigenous populations - for a long time, and thus their belief systems about "Mother Earth" dominated the human society,

在人类社会、治理和景观中占主导地位。与欧洲或美洲的迁徙路线相比，俄罗斯—中国路线仍然拥有大片荒野（例如 Bocharnikov and Huettmann 2019；Regmi and Huettmann 2020）。因此，与自然和宇宙的关系以及相关理解是这一路线的重要特征（Huettmann 2020）。它还包括一些鸟类必须穿越的迁徙障碍，例如北极低温、部分喜马拉雅山脉、鄂霍次克海、白令海、中国海和菲律宾海。此外，该路线还拥有与全球相关的主要湿地（如蒙古湖泊之谷和中国鄱阳湖，Huettmann 2020）和主要沿海红树林、潮汐泥滩、河流系统与河口（雅鲁藏布江、恒河、扬子江、阿穆尔河–黑龙江等；有关分水岭请参见 Regmi and Huettmann 2018；以上湿地的官方汇编概览请见 https://portals.iucn.org/library/node/5933）。

但是，该路线上还拥有分布广泛具有全球意义的城市化热区，例如北京、上海、香港、台北、孟买、加德满都、东京（Chen et al. 2018）。该迁徙路线中包括的生态系统多种多样，包括高北极、北方森林、沙漠、热带雨林、沼泽、高山、高原、岛屿和海洋。从这种多样性和其中广泛的人类存在，可以理解人类在影响该地区候鸟方面发挥着重要作用。显然，该路线为人类文化和人类政策主导，这些都影响着路线形状及其物种组成（Steffen et al. 2015）。可以说，这种关系随着时间的推移而发生了变化，特别是在过去的 50 年中（Elvin 2006，Harris 2008，中国部分；Baumgartner 2015，Byers 2017 and Berger 2020，喜马拉雅部分；Yen et al. 2005，沿线保护区；Klein 2000，Krupnik and Jolly 2006，Huettmann 2012 and Banerjee 2015，北极地区）。尽管过去 50 年对地球母亲的破坏极其严重（Czech et al. 2000，Steffen et al. 2015），然而 30000 到 60000 多年以来，生活在此迁徙路线上的人类生活却没有受到太大影响（Diamond 1997，Vernier and Bruneau 2017）。

俄罗斯北极—中国遥远迁徙路线上神圣性和信仰系统示例

全世界的鸟类，包括沿俄罗斯北极—中国路线飞行的鸟类，都受到多方压力并呈数量消减趋势（Kamp et al. 2015，古北极；Huettmann 2016，大西洋地区），而人为的气候变化是迄今最强烈的人类文化驱动影响力之一（Jiao et al. 2006）。尽管路线沿途存在着许多神圣性文化，但它并无法阻止鸟类数量下降，包括栖息地的变迁和丧失以及气候变化。实际上，人们对“放生”（受宗教信仰影响而将动物释放到野外以求生存的活动，详见 Shiu and Stokes

governance and landscape. Compared with the European or Americas flyways, the Russia-China flyway still holds large sections of wilderness (e.g. Bocharnikov and Huettmann 2019, Regmi and Huettmann 2020) and its associated understandings and relationships with nature and the universe (Huettmann 2020a). It also includes some of the largest migration barriers known for birds to cover and to cross, e.g. Arctic temperatures, parts of the Himalayas, the Sea of Okhotsk, the Bering Sea, the China and Philippine Seas. In addition, this flyway has major wetlands on a global relevance (e.g. Valley of the Lakes-Mongolia, Poyang Lakes-China, Huettmann 2020b) and major coastal mangroves, tidal mudflats as well as river systems and estuaries (Tsangpo, Ganges, Yangtsekiang, Amur-Heilongyang etc; see Regmi and Huettmann 2018 for those watersheds; an official compilation and overview of those wetlands is found here https://portals.iucn.org/library/node/5933).

But also urbanization hotspots of global relevance are found on that flyway that are spreading very vast such as Beijing, Shanghai, Hong-Kong, Taipeh, Mumbai, Kathmandu, Tokyo (Chen et al. 2018) etc. The ecosystems included in this flyway are as diverse as the high arctic, boreal forests, deserts, tropical rainforests, swamps, high mountains, high elevation plateaus, islands and oceans. From this diversity and the vast human presence within, it is understandable that humans play a big role affecting migratory birds in that region. Clearly, this flyway is dominated by the Anthropocene with human cultures and policy at its core affecting the shape of the flyway and its species composition (Steffen et al. 2015). Arguably, this relationship has changed over time, specifically during the last 50 years (Elvin 2006, Harris 2008 for China; Baumgartner 2015, Byers 2017 and Berger 2020 for Himalayas ; Yen et al. 2005 for a protected area along the flyway; see Klein 2000, Krupnik and Jolly 2006, Huettmann 2012 and Banerjee 2015 for the Arctic). While the last 50 years have been specifically devasting for Mother Earth (Czech et al. 2000, Steffen et al. 2015), instead, people lived on the flyway without much impacts for over 30,000 to 60,000 years (Diamond 1997, Vernier and Bruneau 2017).

Examples of Spirituality and Belief Systems at work along the wider Arctic Russia-China flyway

Birds world-wide, and certainly along the Arctic Russia-China flyway, are stressed and on the decline (Kamp et al. 2015 for the palearctic, Huettmann 2016 for Atlantic region), with man-made climate change being one of the strongest human culture driven impact by now (Jiao et al. 2006). While many spiritual cultures exist along the flyway, it has not halted the decline though, including habitat transition and loss, and climate change. Actually, there is a wider concern on some of the religious practices like “merit release” (the spiritually dominated release of animals into the wild; for details see Shiu

2008，Gutiérrez and Buchy 2011）等宗教习俗有着更广泛的关注（Shiu and Stokes 2008；Gutiérrez and Buchy 2011）。

但是，许多关于神圣性的成功故事很容易被提及和展示；见 Ayers et al. 2010，《北极景观可持续性》；Li et al. 2014，《雪豹》；Athreya et al. 2018，《亚洲猫及其猎物和栖息地》。关于鸟类的一个典型例子是西伯利亚鹤（Matthiessen and Bateman 2001，Huettmann et al. 2018）。其他例子如黑颈鹤和萨鲁斯鹤，其在中国西藏和尼泊尔 / 印度地区被视为神鸟（分别见 Han et al. 2018，and Karmacharya et al. 2020）。汉森和惠特曼（2020）举例说明了人类对鸣鸟的精神态度如何使其受到尊重和某种程度的保护，甚至允许它们在人类客厅、卧室、交易大厅、市集和餐馆筑巢。

长嘴麻鹬是另一种特殊鸟类，许多土著人都将其视为神鸟。但是，这些物种似乎在西方主导体制中丧失了神圣特权，正缓慢而平稳地减少（长嘴麻鹬危机示例见 https://www.birdlife.org/worldwide/news/curlews-crisis）。

亚洲许多秃鹰物种在跨文化领域被广泛认为是神圣的和受人尊敬的，而它们现在面临同样的命运，据报道其种群数量已下降超过 80%（Green et al. 2006）。

还有一些经典的水鸟种群也是江河日下，甚至在自然界已经灭绝，例如俄罗斯和亚洲的一些雁类物种（Birdlife International 2012）、小加拿大雁以及白令海和阿拉斯加北极地区的绒鸭物种（Zoeckler 2013；Zoeckler et al. 2016，关于捕猎稀有水鸟）。在 20 世纪被过度捕猎之前，这些物种在迁徙路线上被视为珍贵的食物，和它们的卵与雏鸟一起受到珍视。现在种群消减趋势仍在进行中，而工业活动加速了这种趋势（Klein and Magomedova 2003）。

营养价值不高的鸟类（如雀形目）通常无法得到认可和重视，但几千年来却侥幸躲过了人类活动的影响。因此，历史上它们得以在几乎不受人类文化影响的生态系统中蓬勃发展。雀形目鸟类的灭绝可能是由许多其他因素驱动的，例如遗传因素和所谓的随机事件（有关进化遗传因素的详细信息，如高达 90% 的灭绝率，请参见鸟类学教科书示例，例如 Gill 2007）。

总体而言，无神论 / 世俗、工业途径之于世界、资源和人类社会在评估候鸟方面存在一个固有的问题。它通过栖息地的丧失、转化以及初始禁忌的丧失来实现这一目标，例如自然的脱敏和沦丧，促进和强迫自然资源消费，所谓自由、个人主义和放任保护。世界范围内的经济学教科书称之为“边际成本”（Daly and Farley 2010）。全球的学校都在向新的“现代”青年讲授这一观念模式。

and Stokes 2008, Gutiérrez and Buchy 2011).

However, many success stories of spirituality can easily be mentioned and shown; see Ayers et al. (2010) for Arctic Landscape Sustainability, Li et al. (2014) for Snow Leopards and Athreya et al. (2018) for Asian cats,their prey and habitats. For birds, a typical example is the Siberian Crane (Matthiessen and Bateman 2001, Huettmann et al. 2018). Other examples are found with the Black-necked Crane and the Sarus Crane, which are valued as holy and sacred birds in the wider Tibetan and Nepal/India region (see Han et al. 2018 and Karmacharya et al. 2020 respectively. Hansen and Huettmann (2020) showed examples how the human spiritual attitude towards songbirds keeps them respected and somewhat protected, even supporting them to nest in human living rooms, sleeping quarters, trade rooms, markets and restaurants.

Another bird that is known to be special - sacred by many indigenous people - is the Long-billed Curlew. However, these species seem to have lost that sacred privilege in the dominating western scheme and are now slowly but steady on the decline (For curlew crisis see for instance: https://www.birdlife.org/worldwide/news/curlews-crisis).

Along the same fate are many vulture species in Asia - widely perceived as holy and respected across cultures - they are reported with population crashes of over 80% (Green et al. 2006).

There are also classic waterbirds which have gone "down", even became extinct in nature, e.g. some Russian and Asian *anser* species (Birdlife International 2012), the Aleutian Cackling geese as well as Eider species of the Bering Sea and Alaskan Arctic (Zoeckler 2013; Zoeckler et al. 2016 for a very rare shorebird hunted). Those species were valued along the flyway as precious food items and for their eggs and broods until they go overhunted during the last century; some of those bad practices are still ongoing and now accelerated by industrial activities (Klein and Magomedova 2003) .

Birds of little nutritional value to humans, such as passerines, are often not much recognized and hardly valued, but also not much affected by humans for many thousands of years. Thus, they flourished in an ecosystem that is historically only little affected by humans and their culture. Passerine extinction might be driven by many other factors, such as genetic and so-called stochastic events (see Ornithology textbook example e.g. Gill 2007 for details of app. 90% extinction rates due to evolutionary legacy factors).

Overall, the rather recent atheism/secular and industrial approach to the world, resources and human society has an inherent problem in valuing migratory birds; it achieves that through habitat loss and conversion as well as loss of initial taboos, e.g. de-sensitizing nature and its loss, promoting and forcing consumption of natural resources, a so-called "freedom", individualism and laisse-faire to conservation. In economics and its textbooks taught worldwide, it's referred to as "marginalized costs" (Daly and Farley 2010). This mindset is then taught in schools worldwide to the new "modern" generation.

表 2 迁徙物种、栖息地保护以及栖息地主导信仰示例

保护物种	主要信仰系统	引　　文	说　　明
勺嘴鹬	无神论、萨满教、道教、印度教、自然主义者	Zoeckler et al.（2016）	经常在香港、东京、曼谷等全球主要经济热点城市越冬、中途停留或穿越
大滨鹬	萨满教、无神论、自然主义者	Wilson et al.（2008）	通常生活在偏远的地方，但在迁徙和部分越冬时大量聚集。由于经济发展和气候变化，此物种正在减少
黄胸鹀	无神论、萨满教、道教、印度教、自然主义者	Kamp et al.（2015）	鸣鸟，曾数量丰富，现急剧减少
雪雁	萨满教、无神论、道教、自然主义者	Zoeckler（2013）Fox and Leafloor（2018）	曾经数量丰富的水鸟，数量下降，现趋于恢复或维持在低数量。人类为生计目的收集鸟蛋
绒鸭类（如小绒鸭，王绒鸭，白眶绒鸭，欧绒鸭）	萨满教、无神论、自然主义者	Stehn et al.（1983），Kertell（1991）	曾经数量丰富的水鸟，数量下降，现趋于恢复或维持在低数量。人类为生计目的收集鸟蛋
帝雁	萨满教、无神论、自然主义者	Zoeckler（2013），Fox and Leafloor（2018）	曾数量巨大，后来大量减少和转移，现在又遭捕猎。人类为生计目的收集鸟蛋
红脚三趾鸥	萨满教、无神论、自然主义者	Byrd et al.（2008）	生活在俄罗斯和阿拉斯加之间白令海的偏远岛屿之上。早期曾遭捕猎，现受到现代海洋问题和侵略性哺乳动物影响

如何在飞行路线上更好地运用神圣性价值实施保护？促进世界和平、和谐、财富和时间均等分配以自信而正直地集体反思和采取行动。

西方世界及其财政计划仍然主导着“现代”鸟类研究方法的方方面面（参见 Brown et al. 2007 北极示例—计算泰坦尼克号上的躺椅数量，但尚未解决泰坦尼克号沉没问题；Banerjee 2012，Huettmann 2012 and Krupnik 2020—针对整体种群锐减和极地地区消失）。在商业媒体的强势下，这为人鸟文化设定了全球框架。非政府组织经常被用作这种简约的单方产业模型以及人类与鸟类和鸟类栖息地联系的工具（有关选择性道德脱离，请参见 Bandur 2007）。学校系统因此而遭渗透以推进私有化，而不是推进更广泛的公共福祉和保护

Table 2 Examples of migratory species and habitat conservation and which belief dominates their flyway habitat

Species of Conservation Concern	Dominating Belief System	Citation	Comment
Spoon-billed Sandpiper	Atheism, Shamanism, Daoism, Hinduism, Naturalist	Zoeckler et al. (2016)	This bird is found wintering, stopping-over and flying-by major global urban economic hotspots such as Hong Kong, Tokyo, Bangkok
Great Knot	Shamanism, Atheist and Naturalist	Wilson et al. (2008)	A bird that lives usually in remote places but congregates in larger numbers during migration, and partly wintering. Due to economic development and climate change this species is on the decline
Yellow-breasted Bunting	Atheism, Shamanism, Daoism, Hinduism, Naturalist	Kamp et al. (2015)	Formerly abundant songbird that is now dramatically declining
Anser Geese	Shamanism, Atheism, Daoism, Naturalist	Zoeckler (2013) Fox and Leafloor (2018)	Formerly abundant waterbird that was declining and now tends to recover or stay in low numbers. Specific subsistence egg harvests ongoing
Eider sp (e.g. Steller's Eider, King Eider, Spectacled Eider, Common Eider)	Shamanism, Atheism, Naturalist	Stehn et al. (1983), Kertell (1991)	Formerly abundant waterbird group that was declining and now tends to recover or stay in low numbers. Specific subsistence egg harvests ongoing
Emperor Goose	Shamanism, Atheism, Naturalist	Zoeckler (2013), Fox and Leafloor (2018)	Formerly abundant goose, then strong declines and shifts, now hunted again. Specific subsistence egg harvests ongoing
Red-legged Kittiwake	Shamanism, Atheism, Naturalist	Byrd et al. (2008)	A bird that lives on a few remote islands in the Bering Sea between Russia and Alaska. Harvested in earlier times; now affected by modern ocean problems, and invasive mammals

How to better embrace spiritual values for conservation along the flyway? Promoting world peace, harmony, equal distribution of wealth and time to reflect and act holistically with hubris and decency.

The western world and its monetary scheme still dominates vast aspects of "modern" bird research and study methods (see Brown et al. 2007 for an Arctic example, essentially counting deckchairs on the Titanic but leaving the sinking Titanic problem unresolved; Banerjee 2012, Huettmann 2012 and Krupnik 2020 for entire crashing populations and disappearing polar regions). Enforced by commercial media this sets the global framework for the human-bird culture. NGOs are frequently used as vehicles of this parsimonious one-sided industrial model and relationship how humans relate to birds and habitats (see Bandura 2007 for selective moral disengagement). The school systems

表 3 保护候鸟和栖息地的失败概念

失败概念	引　　文	失败示例
西方法律理论	Huettmann et al.（2011）	自然资源管理、气候变化
新古典主义经济学	Schumacher（1966） Czech（et al. 2007）	气候变化、荒野维护、社会福利、世界和平、生态福利、经济福利
可持续的资源开采	Huettmann（2014） for Pacific Rim	采矿、石油和天然气开采、林业
自由市场经济	CITES.org， Altvater（2008）， Daly and Farley（2010）， Loewy（2009）， Huettmann（2014）	根据定义，市场均衡并非为人类或地球母亲的市场
保护及生态系统管理	Taber and Payne（2003），Belgrano and Fowler（2011）	荒野管理、海洋管理、渔业管理。 生态系统的定义以及管理概念不断变化，而且即使使用此概念，从业者之间差异也较大
保护区	Beiring（2013）， Han et al.（2018）	对大多数国家来说，保护区的覆盖范围远低于规定的 10% 目标，而且不包括宽面（broad-front）迁徙和飞行路线，甚至位于保护区以外地区（详见参考资料）
量化管理	Salsburg（1985）	数字和过度节俭在表达人类现实和宇宙观方面有限
可持续发展目标（爱知目标）	Daly（1997）	可持续发展目标得到了中国的大力支持。 促进全球消费与荒野保护直接冲突

地球母亲！在这种方案中，鸟类处于这种关系的（被动）接受方，因为它们几乎无法与技术和工业思维竞争。这既不是可持续发展，也不是现代发展（Naess 1989，Leopold 2012）。事实清楚地表明了这一点（关于黄海的环境灾难，参见 MacKinnon et al. 2012。黄海是亚洲以及该路线上具有全球意义的重要迁徙停歇地）。“现代化”的主流体系仍然遵循 J. 库克的思维方式和推理方法，就像西方治理系统使用公共资金资助的科学机构那样，先对事物进行计数、了解和描述，然后才能用法院批准的政策进行管理。但是，这一做法在候鸟及其栖息地——包括气候变化——管理方面已大为失败。例如在北极地区，虽然土著人在“西方接触”前从未进行过定量或协调的监测，但这并未导致鸟类和栖息地的灭绝（见 Ayers et al. 2010）。这种灭绝是人为的，正如我们现在所发现的情况（Zoeckler 2013）。相反，禁忌和其他行为方式使大多数

Table 3 Failed concepts for the conservation of migratory birds and habitats

Failed Concept	Reference	Example of Failure
Western Theory of Law	Huettmann et al. (2011)	Natural Resource Management, Climate change
Neoclassic Economy	Schumacher (1966) Czech (et al. 2007)	Climate change, Wilderness Maintenance, Social Well-being, World Peace, Ecological Well-being, Economic Well-being
Sustainable Resource Extraction	Huettmann (2014) for Pacific Rim	Mining, oil and gas extraction, forestry
Free Market Economy	CITES.org, Altvater (2008), Daly and Farley (2010), Loewy (2009), Huettmann (2014)	CITES and xxx; by definition the market equilibrium is not where a market should be for mankind, or for Mother Earth
Conservation and Ecosystem Management	Taber and Payne (2003), Belgrano and Fowler (2011)	Wilderness, Ocean Management, Fisheries Management. The notion of what an ecosystem is and how to manage it is in flux and differs dramatically among practitioners, if it even is used
Protected Areas	Beiring (2013), Han et al. (2018)	The coverage of protected areas is much less than the stated 10% objective for most nations and does not cover broad-front migration and flyways, even located outside of the protected areas (see citations for details)
Quantitative Management	Salsburg (1985)	Numbers and parsimony have their limits to express human reality and the universe
Sustainable Development Goals (SDGs, AICHI targets)	Daly (1997)	SDGs are strongly supported by China. Promotion of a global consumption stands in direct conflict with wilderness conservation

get infiltrated accordingly, promoting privatization instead of the wider public good, and Mother Earth? In such a scheme birds sit here on the receiving side of that relationship as they can hardly compete against technology and such industrial mindsets; it's not a sustainable development, hardly modern (*sensu* Naess 1989, Leopold 2012). Reality shows that clearly (see MacKinnon et al. 2012 for environmental disaster of the Yellow Sea – a major stop-over site of global importance in Asia and for this flyway). The "modern" dominating schemes still follow the mindset and reasoning though of J. Cook and that one must count, know and describe things first before they can get managed with a court-approved policy, as done by the western governance systems using publically-funded science institutions to do so. But this concept has widely failed on migratory birds, their habitats, including climate change. In the Arctic for instance, while indigenous people never really did a quantitative or coordinated monitoring until "western contact" it didnot lead birds and habitats to extinction (see Ayers et al. 2010). The latter is man-made, just the situation as we find now (Zoeckler 2013). Instead, taboos and other mechanisms

荒野景观及其鸟类种群得以生存（有关受这些禁忌和信仰保护的神树，请参见 Chaudhry and Murtem 2015）。例如，在土著文化中，将景观及其动物神圣化的现象非常普遍（Catlin and Matthiessen 2004；Ayers et al. 2010），且在捕获动物之前先征得“神”的许可（Suzuki and Knudtson 1993）。在猎捕中，动植物被认为是主动向人类提供的献祭（Ayers et al. 2010），而不是被简单地捕获、猎杀、消费以获取钱财。

与西方保护管理计划不同的是要接受和教授关于鸟类和环境的更全面的概念，例如万物互联（Naess 1989，Carlson 2012，Trinley Dorje 2018），资源不可随意取用，有限的地球资源不得浪费，财富分配至关重要（Rosales 2008），以及环境不容破坏。这实际上是《生态学》第 101 卷教科书的信息（Miller and Spoolman 2011；关于深生态学，请参见 Naess 1989；关于野生动植物管理原则，请参见 Silvy 2012，Leopold 2012）。千百年来，神秘、神圣性以及对宇宙和创世的尊重都以多种形式而闻名（Messner 2001，Matthiessen and Bateman 2001，Nelson 2008）。可悲的是，这些概念直接违反了经济、银行业和世界治理的所谓的现代概念，而后者阻碍了鸟类保护。人们经常听到来自企业工业界的两种“双赢”论调，一是自然具有韧性，可以自行修复（Chapin et al. 2009；很容易看出这是一个虚假概念和陈述，例如应用于灭绝或全世界整体状态时），二是对自然的影响可以消除（也是不正确的，如《生态学》教科书所述：宇宙中万事万物息息相关）。另一种关于技术与经济进步的经典论调基于业已证伪的库兹涅茨曲线概念（Stern 2004），认为影响轻微，可以忽略（根据《经济学》教科书；Daly and Farley 2010；生态经济学）。这两种说法都不成立，因为每况愈下的鸟类和环境状况未向我们展示其他可能性（如 Resendiz-Infante and Huettmann 2015）。

可以说，经常提及的人类蓄意破坏地球的说法可以休矣。从历史上看，人类并没有破坏地球或大气层（Diamond 1999，Flannery 2002）或鸟类飞行路线。地球母亲得到了普遍尊重，并将继续保持完好无缺状态（Nelson 2008）。各国和全球治理努力制止这种破坏以维护自然，因为这是他们对特定公共信任—资源—的任务之一。全球治理需要解决这一问题，并有可能解决这一问题（Ostrom and Hess 2007）。

好消息是，现有方法和概念可以更好地推动此项工作（ICIMOD 2018a，b）。例如，在日常业务中包括远程耦合（Liu et al.2018）等更为全面的概念将很容易显示出更广泛影响以及如何避免它们。在开放获取和开源代码框架

helped most wilderness landscapes and their bird populations to survive (see Chaudhry and Murtem2015 for sacred groves protected by those taboos and believes). For instance, it's very common in indigenous cultures to treat landscapes and their animals as sacred or holy (Catlin and Matthiessen 2004, Ayers et al. 2010), and to ask for permission from the 'gods' before an animal can be taken (Suzuki and Knudtson 1993). In a harvest, animals and plants are perceived as offering themselves to humans (Ayers et al. 2010). They are not just taken, shot or consumed and as done solely for money.

The alternative to the western conservation management scheme (Silvy 2012) is to embrace, and to teach, a more holistic concept about birds and the environment, e.g. that everything is connected (Naess 1989, Carlson 2012, Trinley Dorje 2018), that resources cannot simply be taken and exploited, that the earth is finite and not to be wasted, that the distribution of wealth matters (Rosales 2008) and that the environmental status must not be compromised. This actually is an "Ecology 101 textbook" message (Miller and Spoolman 2011; see Naess 1989 for Deep Ecology, see also wildlife management principles in Silvy 2012, Leopold 2012). Mystic, spirituality and respect of the universe and creation are known for millennia in many shapes and forms (Messner 2001, Matthiessen and Bateman 2001, Nelson 2008). Sadly, those concepts are in direct violation of so-called modern concepts of economy, banking and world governance standing in the way of bird protection. There are two replies: one frequently can hear from the corporate industrial world to move forward as an assumed "win-win" inwhich it gets stated that nature can recover fine and is resilient (Chapin et al. 2009; instead it is easily to see as an untrue concept and statement when applied to extinction and state of the world), and that impacts can be de-coupled (also untrue because all is connected in the universe; as per Ecology textbook). Another classic argument for technology and economic growth rests on the disproven concept of Kuznets Curve (Stern 2004) and that impacts can be marginalized and are minor (as per textbook in Economics ; Daly and Farley 2010 for Ecological Economics instead). Both claims made are also untrue as the poor and declining state of so many birds and environments show us no other, (e.g. Resendiz-Infante and Huettmann 2015).

Arguably, the often-found statement that people always did damage the earth by definition is one to halt. Historically, humans did not destroy the earth or the atmosphere (Diamond 1999, Flannery 2002), or flyways for that matter. Mother Earth was widely respected and to be remained intact (Nelson 2008). Nations and global governance strived to stop destruction and to maintain nature, as it is part of their mandates for the given public trust-resource. The global governance needs to address that, and probably can (Ostrom and Hess 2007).

On the good news, there are methods and concepts to move forward in better terms (ICIMOD 2018a, b). For instance including more holistic concepts such as telecoupling (Liu et al. 2018) in daily business will easily show wider impacts and how to avoid them. And using latest AI/machine learning methods done in an Open Access and Open Source

中使用最新人工智能 / 机器学习方法来实现可重复和透明的科学，Humphries et al.（2018）展示了自然资源管理中更包容、周到和整体的方法，正如 Nelson（2008）和 Trinley Dorje（2018）提出的对精神和幸福感的要求一样（有关世界幸福感信息，请参见 Lama 2009）。

结　论

生物与非生物世界与更广阔的宇宙相连。强调神圣性可以为我们提供一种古老的、广泛的、性价比高的、现成的选择，用以推进人鸟关系和福祉，但是西方的保护管理对此视若无睹。世界各地的人们都有自己独特的宗教、信仰和观念来处理与自然和鸟类的关系。鸟类特别是世界性候鸟具体反映了这种关系。北极及俄—中迁徙路线是治理世上所余荒野的榜样。对于其他路线上仍然保存下来的神圣性，尤其在已经失去荒野的中欧和美国东部等工业路线上也是如此。现在，他们的神圣性有待重新启动，以释放其对可持续性发展的重要贡献。

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framework for repeatable and transparent science. Humphries et al. (2018) showed the use of a more inclusive, considerate and holistic approach to natural resource management, just as demanded by Nelson (2008) and Trinley Dorje (2018) for the more spiritual and well-being demands (see Lama 2009 for world happiness).

Conclusion

The world -living and non-living - is connected with the wider universe. Emphasizing spirituality offers an old, widespread, cost-effective and readily available, but by western conservation management widely overlooked, option to improve the bird-human relationship and well-being. People all over the world have their own and individual religions, believes and concepts to deal with nature, and birds. Birds can specify and reflect such relationships, specifically internationally migratory ones. The Arctic and its Russia-China Flyway is a role model for treating the wilderness areas left in the world. The same is true for the remaining spirituality on other flyways, specifically industrial ones like in Central Europe and Eastern U.S. but those wilderness regions were already widely lost and their spiritual aspects now await to be re-initiated again to unleash their good contributions to sustainability.

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