Agricultural Research & Technology
Open Access Journal
ISSN: 2471-6774

Juniper Publishers
key to the Researchers

Opinion
Volume 24 Issue 4 - June 2020
DOI: 10.19080/ARTOAJ.2020.24.556277

Agri Res & Tech: Open Access J

From Human-Wildlife Conflicts to Human-Wildlife Coexistence in Anthropocene Landscapes

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Submission: June 20, 2020; **Published:** June 29, 2020

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Opinion

Human activity is altering the biodiversity, species abundance, and biotic interactions on Earth through conversion of ecosystems and their natural functioning. This time period has been appointed Anthropocene from 2000 (Malhi, 2017). The impact in land cover and their transformation has been so extensive that Ellis & Rammankutty (2008) have described the terrestrial biosphere in terms of the current human-altered systems classifying it in anthropogenic biomes, where is recognized that after rangelands (25%), cropland cover the second mayor area on Earth surface (close to 20%). The anthropogenic biomes represent a heterogeneous mosaic that is interspersed with remaining natural areas. These remnants undoubtedly bring closer wildlife and human activities and although various studies have shown that the presence of wildlife can represent high costs for rural communities by establishing competition with humans in agricultural crops (Graham [1]), their absence can also be economically detrimental. Indeed, biodiversity might increase production (Brunetti [2]). Here, I discussed how the current un-precedent biodiversity crisis, can be improved incrementing patches with high habitat quality, connectivity and promoting habitat use in the landscape. Also, we take in account how distance from crop to natural areas, can play a key element that benefit the human-wildlife-relationship. At the same time, coexistence between human and wildlife (in particular fauna) has positive advantages by provisioning and regulating services in croplands (Henchion [3]); (Villamagna [4]). We recommend that more information regarding the benefits of biodiversity to farming activities needs to be generated and outreach farmers. We are now living in highly transformed landscape by our own activities, and some of its particular consequences (e.g. pollution, emerging diseases, climate change, species trade, overexploitation, land use, invasive species, land cover change) are related to an increase in extinction rates, that are now at least 1000 times higher than the natural extinction rate (i.e. the rate of species extinctions that would occur if the humans were not around) and consequently we are living in a planet with a biodiversity crisis ([42] Pim 2014). In particular, the local or functional extinction of animal populations by those human activities a process called defaunation (Galetti & Dirzo, 2012), is associated with a decrease in ecosystems integrity (Bello, *et al.,* 2015; Gutierrez-Arellano & Mulligan [5]; Munguía [6]. Wild fauna, through trophic interactions participate in key ecological processes like predation, seed dispersal, litter respiration and decomposition, carrion removal, herbivory, maintenance of water quality and stream restoration, trampling of seedlings, dung removal, pollination and plant recruitment, carbon cycling, soil erosion and keeping cattle fodder Dirzo [7] and therefore wild fauna have a critical role in the long term prevalence on the ecosystems functioning. Not all animals are equally vulnerable, for example some functional groups as mammalian carnivores and frugivorous or large size birds and mammals, have been detected to be more vulnerable than small mammals, granivores or fossorial groups (Di Minin *et al*., 2016; Munguía [8]; Cooke [9]. Indisputably, one of the biggest threats to animal and plants species persistence is habitat loss (Gatelli & Dirzo 2002; Sánchez-Cordero *et al*., 2005; Ceballos 2017; IUCN 2018; Hannah et al 2020). And as natural habitats transformation increases, also increases the chances of interactions between humans and wildlife, an interaction that frequently leads to competence for space or resources, and to negative perceptions of wildlife by humans and a conservation risk for wildlife, something generically known as human wildlife conflicts (HWC; Morzillo [10]; Baynham-Herd [11].

There is an increasing concern to protect some of the wild fauna species in conflict, such as large carnivores Treves [12]; Di Mini *et al*., 2016), which have become a highly vulnerable group Nyhus [13] not only by hunting or by poisoning but also by their habitat degradation Munguía [8]; Di Minin *et al*., 2016; Munguía

[7]. Hunting of large carnivores sometimes responds to unjustified fears from people (Marchini & Macdonald, 2012), and to the environmental impact resulting from the application of lethal control methods Treves [14]. Large carnivores are top predators, which have a key role in population control of other native species, a cascade of extinctions has been detected in absence of predators (Bergstrom, 2017; Estes [15] therefore a functional decrement of the local ecosystems is unfortunately expected. Among Human Wildlife Conflict, those arising from competition between human and wild fauna for food readily available in agricultural fields are increasing as the agricultural lands are expanding. Large flocks of birds (e.g. starlings), can seriously deplete agricultural fields (Monge, 2013), rodents and insects can easily become uncontrolled pest, damaging grain crops. In an attempt to control the population of these species, in several countries lethal control actions are commonly used (Canavelli *et al*., 2012), which has caused negative impacts in wild fauna populations indiscriminately. Fortunately, non-lethal control alternatives have been gaining attention, these include methods to move problematic individuals of wild fauna species; separate wild animals from people; and use guard animals, mechanical tools, and chemicals to deter wildlife Nyhus [13]. Although, moving wildlife individuals should be carefully planned since can have undesirable consequences, like animal deaths, stress or diseases during transportation, or also organisms translocated can have effects to the new population dispersing its parasites, or diseases. In spite of its relevance, still there are few studies that assess directly the human wildlife conflicts in crops in the Neotropic, for example in Mexico, only 9% of the studies about Human Wildlife Conflict deals with wildlife affecting crops (Flores-Armillas [16]. Under this scenario, it is central to promote the prevalence of wildlife species in the anthropogenic landscape by changing the perspective of conflicts for coexistence and land sharing with wildlife Nyhus [13]; Crespin & Simonetti, 2018) splitting land uses. For this it is necessary to maintain or increase (by active or passive restauration) remnant fragments of natural vegetation where native wildlife, species with irreplaceable ecological role (keystone species) or with high dispersal abilities as large mammals Harrison [17] can maintain long term population. Connectivity between natural patches allows organisms movement through the habitat as well as finding food, refuge, breeding sites, and ideally avoiding adverse interaction with humans Pulliam, 1996; Tilman & Karevia [18].

Therefore, understanding how animals use habitats, can help humans on how to plan land use to favors wildlife species natural movement through the landscape and its survival. The successful conservation of large mammals (e.g. ungulates) has been achieved in part by a good knowledge of its biology and how they use habitats Krausman & Bleich [19]. In this regard, animals participate actively in the natural restauration of vegetation. Seed dispersal by animals play an indispensable role to disperse native plants successfully in the landscape, but the process can be greatly assisted if humans modify its agricultural matrix, by leaving specific areas between remnant fragments of natural vegetation without crops or by leaving patches of crops to be used by wild fauna, in a sort of "biodiversity friendly" agricultural matrix. Many factors may predict why some groups of animals are more likely to damage crops, these include animal life stage, season or time of day, proximity to cultivation, and proximity to natural habitat Nyhus [13]. In particular, by increasing the number of patches with natural vegetation cover within the agricultural landscape, human communities can be benefited by ecological services provided by wild fauna, like pollination, biological pest control (by predation) or dilution effects of disease propagation vectors, all of them with global economic impact.

During the last decade, research on species' responses to habitat loss and fragmentation indicates that appropriately sized landscapes for wild species should maintain at least 40% of forest cover (natural habitat) (although higher percentages are likely needed in tropical ecosystems) Arroyo-Rodríguez [20]. This remaining forest should be configured in a relatively high number of forest patches. In particular, evidence indicates that remaining forest should be configured with ~10% in a very large forest patch, and the remaining 30% in many evenly dispersed smaller patches and semi-natural treed elements Fahrig [17]; Arroyo-Rodríguez [20]. This implies that about 60% of the landscape can be composed of human-settlements and productive lands - a reasonably high amount of land to allow human-wildlife coexistence.

Lower percentages of natural vegetation cover on an anthropogenic landscape, could mean a landscape with very small and isolated natural vegetation patches with higher extinction probabilities for the population of several wildlife species (Radford *et al*., 2005; Betts *et al*., 2006). In this sense, local landscape planning is central to enhance local native species survival, and to maintain their local ecosystem services. More importantly, the sort of natural vegetation patches pattern distribution for high-quality matrix to be achieved, can be different for different species. For instance, a particular anthropogenic landscape can affect quite differently the persistence of different sort of wildlife species Arroyo-Rodríguez [21], like forest specialist species, open habitat specialists, or habitat generalist species, as they will be able to use mostly natural vegetation patches, or ecotones and areas of secondary vegetation or all land cover classes, respectively.

The HWC could become more critical when the wildlife species involved are already struggling for its conservation, as could be the case for example for African elephant (*Loxodonta africana*), hippopotamus (*Hippopotamus amphibius*), chimpanzee (*Pan troglodytes*), Mauritian flying fox (*Pteropus niger*), bearded capuchin (*Sapajus libidinosus*) or Sumatran orangutan (*Pongo abelii*), among many others (Naughton-Treves [22]; Hill [23]; Olesky *et al*., 2018). Many of this threatened species are affected by habitat degradation and with continuing agricultural expansion into their habitats many will include agricultural crops in their dietary habits. For example, among the wild fauna species involved in HWC due to crop damage in Mexico, according to Flores–Armillas

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[16] are included the white-tailed deer (*Odocoileus virginianus*) that is the mammal species with the highest cultural value across the country Ávila-Najera [24], the white nosed coati (*Nasua narica*) extensively hunted to prevent crop damage and with decreasing populations in part for that reason Cuarón [25] and the Merriam's pocket gopher (*Cratogeomys merriami*) which endemic to Mexico and restricted to a quite narrow area in the central part of Mexico, with intense agricultural activity. Considering behavior of wildlife species involved in negative interactions with humans, particularly how animal's behavior is affected by the way they perceive habitat disturbance and risk, is useful for managing this sort of negative interactions Blackwell [26]. For instance, one possible way to minimize the potential negative interactions between farmers and wildlife, could be setting crops fields at minimum distances from the natural vegetation patches, considering the movement behavior of species involved in crop damages in the landscape.

For instance, for white-tailed deer it is known that physical habitat features as well as its resource availability affect its small-scale movements (e.g. within their home ranges) and that long-terms movements (e.g. dispersion) are more affected by the landscape configuration Long [27]; Contreras-Moreno [28]. Therefore, at a local scale, placing agricultural fields too close to remnant forest patches could increase the probability of crop damage since are easily on range of small-scale movements of deer individuals. And, to maintain connectivity between white-tailed deer populations, it is needed that at the landscape scale, the agricultural matrix should be planned or modified to provide enough forest patches within to ease deer dispersal movements and minimize its need to forage on crop lands while dispersing. More studies, at local and landscape scales, about how different distribution patterns of agricultural lands, favors or diminish crop damage by different wildlife species are needed. When wildlife species affects croplands, negative perceptions arises that eventually could derive in negative impacts on its populations (e.g. control or retaliation hunting, overexploitation or even favors illegal trade). But this, in turns, could have further negative consequences by affecting its ecological interactions Valiente-Banuet [29] and eventually could lead to secondary local extinctions and loss in ecosystem integrity. Direct crop damage is more easily perceived by peasants and farmers than indirect trophic interactions that provides them with ecological services needed for agriculture e.g. pest control; Olimpi [30]. Consequently, finding alternatives to minimize negative interactions with wildlife in croplands allowing land sharing and coexistence with them, could be helpful too, to maintain populations of species that provide ecosystem services to crops. Some crops, like coffee, fruiting trees like apples, sunflowers, sugarcane or cacao, among many others, are pollinator-dependent mainly by bees, but also by hummingbirds, honeyeaters, sunbirds and bats. Bees are pollinators for about one-third of the plants we eat, a service that has been valued at US$ 168 billion per year worldwide. Pollinators are more pronounced in developing countries compromising two-thirds of the land devoted to crop cultivation globally Kremen [31]; Klein [32]. However, many pollinator species are being threaten, paradoxically, by certain agricultural practices, like the use of pesticides usually sprayed on plants to control pests, but they also damage bees´ cognition. For this reason, seeking a different sort of agricultural landscape it is needed, with patches of natural vegetation cover, of different sizes, intermixed with agriculture fields, a more "pollinator friendly" landscape providing habitat for them and lowering or halting the use of pesticides in crops. This could sustain local abundance and diversity of wild pollinator species that in turns can provides its ecological services to crops. Ten years after the bee collapse manifested all over the world, we mainly know that we need more knowledge about native bees and their role in agriculture and that we have to improve the environment in which bees collect their food.

Other important group to the human is that of predator species (e.g. vipers, raptor birds and insectivorous bats) providing control of agricultural pests. They have had less attention in the literature or in research Mols & Visser [33]; Maas [34] but they can have a potential economic impact in crops Gutierrez Arellano & Mullingan [35]. For example, in Austria it has been estimated that pest control is value it is approximately 255 million euros or 8.5 % of the total agricultural plant product value Zulka & Götzl [36]. Enhancing agricultural landscapes to promote the presence and to increase the abundances of wild fauna species that control pest of crops can produce economic advantages to food producers as well as have positive ecological consequences Lindell [37]. Megadiverse countries like Mexico has historically lost a large proportion of its natural forested areas due to the conversion to livestock and agricultural fields Challenger [38]; Sarukhán [39]; INEGI [40]. Mexico should increase, in the near future, the knowledge on how its biodiversity benefits the human activities like agriculture. Fortunately, there are preserved areas (11.14%-218, 831 km^2-, of land surface decreed; CONANP [41] covered by natural ecosystems which allow the presence of numerous species of wildlife but also allow people live there from long time ago. Therefore, many management strategies could be learned from local people and their use of biodiversity in those areas. All species providing ecosystem services, like those provided particularly to agriculture, depend on keeping intact habitat patches in the agricultural landscape [42-49]. It will be wise to change the perspective of conflict with wildlife prevalent in agricultural practices, to a different one, that provide productive and ecological scenarios that allows sharing land with wildlife and coexistence with them, helping to its conservation.

Acknowledgements

This work was supported by IGamma Proyect. CONACyT fund M0037-2018-07, Number 296842. MM thanks to D. Valenzuela, M. Correa-Cano and V. Arroyo-Rodríguez for their valuable comments that help to improve this manuscript.

How to cite this article: Munguía-Carrara M. From Human-Wildlife Conflicts to Human-Wildlife Coexistence in Anthropocene Landscapes. Agri Res & Tech: Open Access J. 2020; 24(4): 556277. DOI: 10.19080/ARTOAJ.2020.24.556277

References

1. Graham EH (2005) Legumes for Erosion Control and Wildlife. Soil Conservation Service US Department of Agriculture.
2. Brunetti I, Tidball M, Couvet D (2019) Relationship between biodiversity and agriculture production. Natural Resource Modeling 32(2): e12204.
3. Henchion M, Mc Carthy M, Resconi VC, Troy D (2014) Meat consumption: Trends and quality matters. Meat Science 98(3): 561-568.
4. Villamagna AM, Mogollón B, Angermeier PL (2014) A multi-indicator framework for mapping cultural ecosystem services: The case of freshwater recreational fishing. Ecological Indicators 45: 255-265.
5. Gutierrez-Arellano C, Mulligan M (2018) A review of regulation ecosystem services and disservices from faunal populations and potential impacts of agriculturalization on their provision, globally. Nature Conservation.
6. Munguía Carrara M, Equihua M, Equihua J, Schmidt M (2019) Diversidad funcional en los mamíferos de México e Integridad Ecosistémica In: Ornelas-García C P, Álvarez F, Ay Wegier A (Eds.), Antropización: primer análisis integral, Ibunam, Conacyt Red Temática de Fauna Nativa en Ambientes Antropizados. UNAM: pp387-402.
7. Dirzo, R, Young HS, Galetti M, Ceballos G, Isaak N. J. B., Collen B (2014) Defaunation in the anthropocene. Science 345, 401–406.
8. Munguía M, Trejo I, González-Salazar C, Pérez-Maqueo O (2016) Human impact gradient on mammalian biodiversity. Global Ecology and Conservation 6: 79-92.
9. Cooke RSC, Eigenbrod F, Bates AE (2019) Projected losses of global mammal and bird ecological strategies. Nat Commun 10: 2279.
10. Morzillo A, De Beurs K, Matin Mikle C (2014) A Conceptual framework to evaluate human-wildlife interactions within coupled human and natural systems. Ecology and Society 19: 44.
11. Baynham Herd Z, Redpath S, Bunnefeld N, Molony T, Keane A (2018) Conservation conflicts: Behavioural threats, frames, and intervention recommendations. Biological Conservation 222: 180-188.
12. Treves A, Karanth KU (2003) Human-carnivore conflict and perspectives on carnivore management worldwide. Conserv Biol 17(6):1491-1499
13. Nyhus PJ (2016) Human-Wildlife Conflict and Coexistence. Annual Review of Environment and Resources 41:143-171.
14. Treves A, Wallace R, Naughton Treves L, Morales A (2006) Co-Managing human wildlife conflicts: A review. Human Dimensions of Wildlife 11(6): 383-396.
15. Estes JA, Terborgh J, Brashares JS, Power ME, Berger J (2011) Trophic downgrading of planet Earth. Science 333(6040):301-306.
16. Flores Armillas VH, Valenzuela Galván D, Peña Mondragón JL, López Medellín X (2020) Human-wildlife conflicts in Mexico: Review of status and perspectives. Ecosistemas y Recursos Agropecuarios 7(1): e2274.
17. Fahrig L, Arroyo Rodríguez V, Bennett JR, Boucher Lalonde V, Cazetta E (2019) Is habitat fragmentation bad for biodiversity? Biological Conservation 230: 179-186.
18. Tilman D Kareiva P (Eds.) (1997) Spatial Ecology: The Role of Space in Population Dynamics and Interspecific nteractions. Princeton University Press, Princeton.
19. Krausman PR, Bleich VC (2013) Conservation and management of ungulates in North America. International Journal of Environmental Studies 70(3): 372-382.
20. Arroyo Rodríguez V, Fahrig L, Tabarelli M, Watling JI, Tischendorf L (2020) Designing optimal human-modified landscapes for forest biodiversity conservation. Ecology Letters 1-15.
21. Arroyo Rodríguez V, Galán Acedo, Fahrig L (2017) Habitat fragmentation. The International Encyclopedia of Primatology 1-10.
22. Naughton Treves L (1998) Predicting patterns of crop damage by wildlife around Kibale National Park, Uganda. Conservation biology 12(1): 156-168.
23. Hill CM (2017) Primate crop feeding behavior, crop protection, and conservation. International Journal of Primatology 38(2): 385-400.
24. Ávila Nájera D M, Naranjo E J, Tigar, B., Villarreal, O., & Mendoza, G. D. (2018). An evaluation of the contemporary uses and cultural significance of mammals in Mexico. Ethnobiology Letters 9(2): 124-135.
25. Cuarón AD, Helgen K, Reid F, Pino J, González Maya JF (2016) Nasua narica. The IUCN Red List of Threatened Species 2016: e.T41683A45216060.
26. Blackwell BF, De Vault TL, Fernández Juricic E, Gese EM, Gilbert Norton L, et al. (2016) No single solution: Application of behavioural principles in mitigating human–wildlife conflict. Animal Behaviour 120: 245-254.
27. Long ES, Diefenbach DR, Rosenberry CS, Wallingford BD, Grund MD, et at. (2005) Forest Cover Influences Dispersal Distance of White-Tailed Deer. Journal of Mammalogy 86(3): 623-629.
28. Contreras Moreno FM, Hidalgo Mihart MG, Contreras Sánchez WM (2019) Daily Traveled Distances by the White-Tailed Deer in Relation to Seasonality and Reproductive Phenology in a Tropical Lowland of Southeastern Mexico. In: Reyna-Hurtado R., Chapman C. (eds) Movement Ecology of Neotropical Forest Mammals. Springer, Cham.
29. Valiente Banuet A, Aizen MA, Alcántara JM, Arroyo J, Cocucci A, et at. (2015) Beyond species loss: the extinction of ecological interactions in a changing world. Funct Ecol 29(3): 299-307.
30. Olimpi EM, Garcia K, Gonthier DJ, De Master KT, Echeverri A, et al. (2020) Shifts in species interactions and farming contexts mediate net effects of birds in agroecosystems. Ecological Applications e02115.
31. Kremen C, Williams NM, Thorp RW (2002) Crop pollination from native bees at risk from agricultural intensification. Proceedings of the National Academy of Sciences of the United States of America 99(26): 16812-16816.
32. Klein AM, Vaissière BE, Cane JH, Steffan Dewenter I, Cunningham SA, et al. (2007) Importance of pollinators in changing landscapes for world crops. Proceedings of the Royal Society of London Series B Biological Sciences 274(1608): 303-313.
33. Mols CMM, Visser ME (2007) Great Tits (Parus major) Reduce Caterpillar Damage in Commercial Apple Orchards. PLoS One 2(2): e202.
34. Maas B, Karp DS, Bumrungsri S, Darras K, Gonthier D, et al. (2016) Bird and bat predation services in tropical forests and agroforestry landscapes. Biological Reviews of the Cambridge Philosophical Society 91(4):1081–1101.
35. Gutierrez Arellano C, Mulligan M (2018) A review of regulation ecosystem services and disservices from faunal populations and potential impacts of agriculturalisation on their provision, globally. Nature Conservation.
36. Zulka KP, Götzl M (2015) Ecosystem Services: Pest Control and Pollination. In: Steininger K, König M, Bednar Friedl B, Kranzl L, Loibl W, Prettenthaler F (eds) Economic Evaluation of Climate Change Impacts. Springer Climate. Springer, Cham.
37. Lindell C, Eaton RA, Howard PH, Roels SM, Shave ME (2018) Enhancing agricultural landscapes to increase crop pest reduction by vertebrates. Agriculture, Ecosystems & Environment 257: 1-11.

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38. Challenger A (1998) Utilización y Conservacion de los Ecosistemas Terrestres de México. Psado, Presente y Futuro pp.847.

39. Sarukhán J, Koleff P, Carabias J, Soberón J, Dirzo R, et al. (2017) Capital natural de México. Síntesis: evaluación del onocimiento y tendencias de cambio, perspectivas de sustentabilidad, capacidades humanas e institucionales. Comisión Nacional para el Conocimiento y Uso de la Biodiversidad.

40. INEGI (2016) Conjunto de Datos Vectoriales de Uso de Suelo y Vegetación. Escala 1:250 000. Serie VI. escala: 1:250 000. edición: 1. Instituto Nacional de Estadística y Geografía. Aguascalientes, México.

41. CONANP 2019.

42. Barnosky A, Matzke N, Tomiya S, Susumu W, Guinevere OU, et al. (2011) Has the Earth's sixth mass extinction already arrived? Nature 471: 51-57.

43. Carter NH, Shrestha BK, Karki JB, Pradhan NMB, Liu J (2012) Coexistence between wildlife and humans at fine spatial scales. Proc Natl Acad Sci 109 (38): 15360-15365.

44. Cavender Bares J, Kozak KH, Fine PV, Kembel SW (2009) The merging of community ecology and phylogenetic biology. Ecology Letter 12(7): 693-715.

45. Cooke RSC, Eigenbrod F, Bates AE (2019) Projected losses of global mammal and bird ecological strategies. Nat Commun 10(1): 2279.

46. Ellis EC, Ramankutty N (2008) Putting people in the map: anthropogenic biomes of the world. Frontiers in Ecology and the Environment, 6(8): 439-447.

47. Kremen C, Williams NM, Aizen MA, Gemmill Herren B, Le Buhn G, et al. (2007) Pollination and other ecosystem services produced by mobile organisms: A conceptual framework for the effects of land-use change. Ecology Letters 10(4): 299-314.

48. Mahli Y (2017) The concept of Anthropocene. The Annual Review of Environment and Resources 42: 77-104.

49. Oleksy RZ, Ayady CL, Tatayah V, Jones C, Froidevaux JS, et al. (2018) The impact of the Endangered Mauritian flying fox Pteropus niger on commercial fruit farms and the efficacy of mitigation. Oryx 1-8.

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