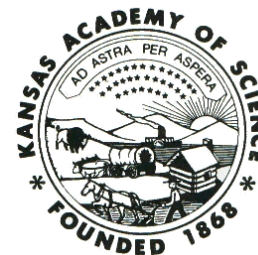


KAS BULLETIN



NEWSLETTER OF THE KANSAS ACADEMY OF SCIENCE

DUSTIN WILGERSPRESIDENT	MIKE & PAMELA EVERHART TRANSACTIONS EDITOR
MARK LABARGEVICE PRESIDENT	ERIKA MARTIN TRANSACTIONS EDITOR
BRIAN MARICLE PAST-PRESIDENT	SAM LEUNG SECRETARY/WEBMASTER
STUART GARDNERPRESIDENT-ELECT	HANK GUARISCO BULLETIN EDITOR
SHAUN SCHMIDTTREASURER	JENNIFER HAIGHT BULLETIN ASSISTANT EDITOR

VOL. 46 NO 2

<http://www.KansasAcademyScience.org/>

August, 2021

154th ANNUAL MEETING OF THE KANSAS ACADEMY OF SCIENCE

The 154th annual meeting of the Kansas Academy of Science has not yet been scheduled. KAS is still planning to hold an in-person meeting, but the location and date have yet to be determined. Check the KAS website for updates. Due to the Covid outbreak, last year's annual meeting was held virtually on April 10, 2021.

KAS Annual Dues To Increase in 2022

At the Kansas Academy of Science board of directors summer meeting, we decided to raise membership dues to cover rising costs of publishing the Transactions. Starting in 2022, regular annual membership dues will be \$40, student membership will be \$20, and family membership will be \$60. No further increases in dues are expected for at least the next several years.

KAS Educator Grants Available

Supporting science education within the state, the Kansas Academy of Science is offering six competitive grants of up to \$500 each: three for high school educators and three for K-8 educators. Applications can be submitted by an individual or a team. Priority will be given to projects that focus on student experiences, increase student engagement, and bring a new topic or activity to the classroom. The application deadline is September 30, 2021. Applications forms and guidelines can be found on the KAS website.

Announcement of KAS By-Law Changes

The following additions to the Kansas Academy of Science By-Laws have been proposed. Adoption of these changes will be voted upon by those members attending the next KAS board meeting.

Article II. The Officers

Section 1b.

Original

The appointed officers shall include an Editor of the Transactions of the Kansas Academy of Science, an Editor of the Academy Newsletter, an Historian, and Director of the Kansas Junior Academy of Science (KJAS).

Amended Version

The appointed officers shall include an Editor of the Transactions of the Kansas Academy of Science, an Editor of the Academy Newsletter, an Historian, a Director of the Kansas Junior Academy of Science (KJAS), **and up to two Grant Coordinators.**

Section 3.

Original

The terms of office for the President, President-Elect, Vice President, Immediate Past President, Secretary, and Treasurer shall be one year, and for the Director of the KJAS, three years; those for the Council Members-at-Large shall be for three years (with election to provide for staggered terms so that no more than two council members shall be elected in any one (year); and those for the Historian shall be three years.

Amended Version

The terms of office for the President, President-Elect, Vice President, Immediate Past President, Secretary, and Treasurer shall be one year, and for the Director of the KJAS **and Grant Coordinators**, three years; those for the Council Members-at-Large shall be for three years (with election to provide for staggered terms so that no more than two council members shall be elected in any one (year); and those for the Historian shall be three years.

New Section

Section 6e.

The Grant Coordinators shall be responsible for all aspects related to grants awarded by KAS (e.g. undergraduate and graduate research grants, K-12 teacher grants). This will include but is not limited to the communication of funding opportunities and application requirements, the review and decision of the awards, and communication with the grantees following the grant decisions. The Grant Coordinators may appoint unpaid volunteers to aid in the process of reviewing proposals. The Grant Coordinators will report on these activities annually to the Executive Council.

Understanding the Natural World and the Diverse Creatures that Inhabit It

by Hank Guarisco, editor

As adults and scientists, we must never lose our child-like fascination with the world around us, and approach nature and its inhabitants with awe, wonder, and reverence. In the long course of history, we are but a small, yet very influential species, with great powers resulting from our large brains. May the wisdom of our hearts also expand our capacity to love, cherish, and honor the earth, our common home.

The theme of this newsletter is the natural world around us, our evolving views toward the living earth, and the destructive effects of our unfettered growth. I found this quote of Henry Beston, an environmental writer that was a major influence on Rachael Carson, author of "Silent Spring," hanging on the wall in the study of my mentor, Henry S. Fitch, after he went to live out his remaining years with his daughter in Oklahoma.

We need another and a wiser—perhaps a more mystical concept of animals. Remote from universal nature and living by complicated artifice, man in civilisation surveys the creature through the glass of his knowledge and sees thereby a feather magnified and the whole image in distortion. We patronize them for their incompleteness, for their tragic fate of having taken form so far below ourselves. And therein we err and greatly err. For the animal shall not be measured by man. In a world older and more complete than ours they move finished and complete, gifted with extensions of the senses we have lost or never attained, living by voices we shall never hear. They are not brethren. They are not underlings. They are other nations—caught with ourselves in the net of life and time, fellow prisoners of the splendour and travail of the earth.

Henry Beston

The Outermost House

A Historical View of Conservation

by Hank Guarisco, editor

After perusing several issues of Nature Magazine published in 1935 and 1936, I was struck by the similarity of some of the burning conservation issues presented therein with modern day concerns. There was a growing realization that wildlife populations, as well as unique natural ecosystems, were being decimated and exploited by special interest groups, and that these natural resources belonged to all citizens of the United States.

An article in the November 1935 issue entitled, "Guests in the House of Nature," expressed an enlightened view:

"Mother Nature" is a phrase that should not be spoken without thought of its meaning, but rather with full intent and reverence. Nature not only is our mother by generation, but, a true mother, she offers always that solace we humans so often sorely need. Where do we turn, instinctively, to rest the body and soothe the spirit? Where to escape from the rush and jangle of every-day life, and to seek respite, even if briefly, from clashing human contacts? Where but to Nature, her woodlands and waters, to be at one for a time at least with trees and herbs, and all living things?

These sentiments, and the myriad psychological and physical benefits of being in nature for both adults and children, as documented by numerous studies, have been presented by Richard Louv in his 2005 book entitled, *Last Child in the Woods, Saving our Children from Nature-deficit Disorder*.

One major issue of the 1930s was the dwindling populations of ducks and geese, mostly from overhunting, and a cry for waterfowl regulations. Nature Magazine editor, Arthur Newton Pack, happily reported that the United States District court in eastern Kentucky upheld the Secretary of Agriculture's right to limit the hunting of migratory birds under the Migratory Bird Treaty Act of 1918. However, in the October 1936 issue, the same author lamented the fact that "an open hunting season was declared when the desperate condition of the birds, complicated by serious drought destruction, demanded a closed season."



GREAT BLUE HERON

PHOTOGRAPH BY WALTER HASTINGS

One of the birds persecuted by the "vermin" hunters on the ground that it destroys game fishes

Another assault on wildlife habitat was, and still is, the construction of hydroelectric dams. An article in the March 1936 issue entitled, "What Price Power?" lamented the proposed damming of the Santee River in South Carolina which would result in the loss of primeval forests. Another area of contention that has persisted to the present day involves damming the Columbia and Klamath rivers, and their catastrophic effects on salmon populations. Two articles in the August 1935 and 1936 issues discuss the detrimental effects of high dams, and the dubious efficacy of fish ladders.



TOO BAD THE POOR FISH CAN'T DO THIS!

**If dams could have fishways, there would be
no objection to them**

Throughout the pages of these magazines, the authors report on the wanton killing of wildlife, and nascent attitudes with respect to predators. Traditionally, hunters have believed that predators were directly competing with them for game animals, and therefore that they should be killed. An article entitled, "The Least of These" (November 1935), made a convincing argument that wildlife policies should be for public benefit and the benefit of wild life in general, not for those of one special group, namely hunters. Those who hunted ruffed grouse had composed a "hit list" of enemies that included the skunk, raccoon, fox, weasel, great horned owl, Cooper's hawk, sharp-shinned hawk and the Goshawk. However nature lovers would be just as thrilled to see a goshawk as a grouse, or to hear the hooting of an owl as the drumming of a "partridge." The author concludes: "Every wild creature is in justice entitled to preservation, and man by attempting to

suppress some and encourage others not only is acting arbitrarily and ruthlessly but also heedlessly and recklessly, not appreciating what is best for human society on the whole and in the long run.”



C
a
t
a
s
t
r
o
p
h
e



The value of predators in controlling deer populations was recognized in the early 1900s. An article entitled, “Ideas Change About Killing of the Cougar” (November 1935), related the extirpation of the mountain lion in the Kaibab forest on the north rim of the Grand Canyon, and the concomitant explosion of the deer population. “By 1924 the deer had increased until more than seventeen hundred were counted in one meadow. Winter came, deer died of weakness and starvation and those that lived ate every leaf and twig they could reach, until the whole country looked as though a swarm of locusts had swept through it.”

Another hotly contested issue at the time was the proliferation of billboards along highways, their damage to the scenery, and their role in traffic accidents. The court battles between the billboard industry and the states of Maine, New Jersey, New York, and Massachusetts were vividly recounted in two articles entitled: “Bay State Billboards” (October 1935) and “Progress in Roadside Legislation” (November 1935). The Supreme Court of Massachusetts sustained the right of the state to control the erection of billboards so that motorists would be safer and have a more pleasurable ride. It concluded that the billboard industry was not exercising a “natural right” in ruining the rural landscape. “It affirmed the right of the traveler upon the highways to a peaceful and unannoyed journey.” Even after this ruling, the industry, with the help of governor, went to great lengths to weaken this law. Thankfully, the public good eventually prevailed.

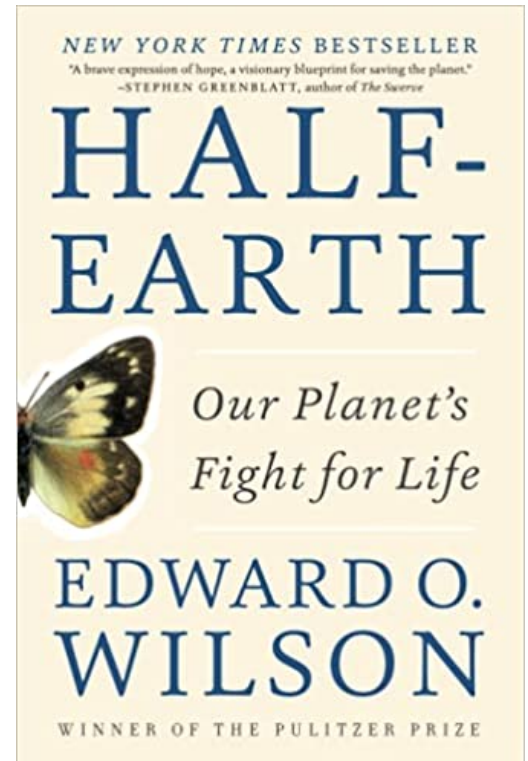
As we tackle the modern-day issues of global warming and imminent climate catastrophe, it is heartening and enlightening to remember the conservation struggles of a previous era in our nation’s history. Basically, it comes down to the interests of a few special interest groups versus the public good.

BOOK REVIEW: Half-Earth Our Planet's Fight for Life.

2016. E.O. Wilson. Liveright Publ. Corp., div. of W.W. Norton & Co., NY, 259 p.
by Hank Guarisco, editor

This stimulating paperback by well-known entomologist, ecologist, and conservationist, Edward O. Wilson, is a concise treatise of the current state of the biosphere, our evolving attitudes towards the living world around us, and the appropriate measures needed to avoid the most catastrophic effects of humankind's imposition upon our fellow creatures and our disruption of the climatic, chemical and biological systems that support us all.

Beginning in an eloquently direct manner, the author states the problem: human activity has caused the rapidly accelerating decline of animals and plants throughout the world on a scale equivalent to the major extinction events of the past, such as the demise of the dinosaurs. "Meanwhile we thrash about, appallingly led, with no particular goal in mind other than economic growth, unfettered consumption, good health, and personal happiness. The impact on the rest of the biosphere is everywhere negative, the environment becoming less stable and less pleasant, our long-term future less certain." If we continue along this path, most of the species on earth will not survive. Our ingenious technological fixes have postponed some human-caused calamities, but they have also allowed some of us to believe that we are actually not dependent upon the natural world for our very survival. This is a grave mistake for all of life on earth, including our own.



Wilson proposes an emergency solution, setting aside one-half of the earth for the natural world. "Why one-half? Why not one-quarter or one-third? Because large plots, whether they already stand or can be created from corridors connecting smaller plots, harbor many more ecosystems and the species composing them at a sustainable level." Based on biodiversity research of reserves of various sizes, he estimates that this measure would save about 80% of the species on earth. People need a definite goal, not just news that some progress is being made. This is a bold plan, but immanent disaster is at hand and we can rise to the occasion. I guess the real task is to convince ourselves and the public that this is truly a disaster.

Do we really need a biosphere? How many species can we lose before we see drastic changes? Sometimes it takes only the loss of one species, such as the chestnut tree, to transform the landscape. "Human beings are not exempt from the iron law of species inter-dependency. ...The biosphere does not belong to us; we belong to it."

Although we are familiar with iconic mammals, birds, some reptiles and amphibians, and perhaps more of the notable invertebrates, scientists estimate that only 20% of the species on this planet have been described, and we even know less about how they function within ecosystems. The author recounts his personal experience studying ants, and the many undescribed species waiting to be named and placed within the tree of life. It is a major failure of education that results in the public's ignorance of "bugs." The smaller creatures actually run the world, so we are woefully unprepared to determine the importance of various life forms in natural ecosystems.

Invasive species, including ourselves, have reeked havoc on endemic flora and fauna. Many iconic examples are presented, such as the dodo on the island of Mauritius. This turkey-sized, flightless bird was easily captured, killed and eaten in such numbers that it became extinct before 1700. Islands are especially vulnerable to exotic invaders because their inhabitants did not evolve adequate defenses against them, and their populations are often small in size.

The current rate of extinction, all due to human activity, is 100 or 1000 times greater than normal. Some people may ask why extinction is such a disaster since 99% of the species that have lived on earth are no longer here. "The answer, of course, is that many of the species over the eons didn't die at all, they turned into two or more daughter species." Why is extinction accelerating? The reasons are: pollution, human population growth, and overhunting. It is important to remember that these agents operate synergistically. "Clearing a forest for agriculture reduces habitat, diminishes carbon capture, and introduces pollutants that are carried downstream to degrade otherwise pure aquatic habitats en route."

Life on earth has evolved in a different manner in temperate vs. tropical climates. As one travels northward, greater energy must be expended to cope with more severe climatic conditions. This limits the number of species that are found there. Therefore, biodiversity is much richer in tropical regions than in temperate ones. Also, temperate species are often wide-ranging, while those inhabiting the tropics have very restricted ranges. Therefore, they are more vulnerable to extinction.

Another misconception concerning endangered species involves the attitude that these species are probably senescent. "You might think that its time has come, so let it go. On the contrary, its young are just as vital as the young of the most aggressive expanding species with which they compete. If its population is shrinking in size,...the reason is the predicament in which the Darwinian process of natural selection has placed it. The environment is changing..." "Humanity, keep in mind, is the principal architect of such maladaptive environments."

I remember one glaring example of this misguided attitude when the California condor population had dwindled to almost a handful of individuals, and a prominent nature magazine featured an article proposing that we let it drift into the sunset with dignity, rather than take heroic measures to save it from extinction because it was around since the Pleistocene and probably was

a senescent species. Luckily, this argument did not prevail, and the California condor population has expanded in size and increased its range due to our heroic efforts.

Another very dangerous worldview proposes that humanity has already caused so many changes to natural ecosystems that it is beyond repair and no pristine areas remain on earth. These Anthropocene proponents claim that traditional conservation efforts have failed and ...”what is left of nature should be treated as a commodity to justify saving it. The surviving biodiversity is better judged by its service to humanity.” This attitude has led to “...a variety of practical considerations. First and foremost, nature parks and other reserves should be managed in a way that helps them meet the needs of people. And not all people, but implicitly those of us alive at the present time and into the near future, with our contemporary aesthetics and personal values made decisive – hence forever.” This attitude has been expressed by the Nature Conservancy’s chief scientific officer, Peter M Kareiva. He has declared there are no pristine wilderness areas on earth and therefore, they should be opened to people for management and profit, ie. “...’working landscapes’, presumably as opposed to ‘lazy and idle’ landscapes, thereby making them more acceptable to economists and business leaders.”

However, wilderness refers to “...undomesticated places not yet yoked to the human will.””Wildernesses have often contained sparse populations of people, especially those indigenous for centuries or millenia, without losing their essential character.” Wilderness areas are real, and ...”cannot be defined out of existence.” Wilson goes on to state: “It has been my impression that those most uncaring and prone to be dismissive of the wildlands and the magnificent biodiversity these lands still shelter are quite often the same people who have had the least personal experience with either.”

The second part of the book explores the real living world. Conservation science is continuing to uncover the depths and breadth of biodiversity in special regions, such as the Great Smoky Mountains National Park. Almost 20,000 species have been documented there. Due to the sometimes overwhelming number of species involved in ecosystems, and the difficulty in identifying them, ecologists have turned to computer modeling to understand these systems. But, “In the same way that physiology and medicine could not have advanced (nor been properly taught) without a solid knowledge of the organs and tissues of the human body, serious future advance of ecosystems analysis cannot be expected to emerge without a solid knowledge of the species composing one ecosystem at a time.”

Although it is essential to develop complete species lists of an area or ecosystem, we must also begin to understand how they interact with one another. Nature is full of complex food webs. For example, the jumping spider, *Evarcha culicivora*, of East Africa preferentially preys upon mosquitoes that have recently fed upon the blood of vertebrates. It can see color, and is attracted

to the red coloration of the abdomen of a mosquito that has recently had a blood meal. Other interesting examples of complex interactions are presented.

Like some wizard, Wilson takes us on a magical carpet ride to the most biodiverse spots on the planet. These include: the Giant Redwood Forest, the Amazon River Basin, the West Indies, the Tepuis of Venezuela and western Guyana (“These tabletop mountains are the imagined ‘lost worlds’ of H.G. Wells.”), the Galapagos, and more exotic regions.

The last part of the book, Part 3, discusses a solution to accelerating biodiversity loss. “The only solution to the ‘Sixth Extinction’ is to increase the area of inviolable natural reserves to half the surface of the earth or greater. ...But it also requires a fundamental shift in moral reasoning concerning our relation to the living environment.” Some regions can be restored by introducing a few keystone species and controlling one or two invasive species. Corridors can be built between protected areas so that species can have easier access to them. A number of examples of successful restoration efforts are presented. One individual bought up land in the Florida Panhandle and replanted longleaf pine forests, the original habitat of most of the southeastern US. Another far-sighted person revitalized a national park in Mozambique.

He answers questions concerning rising population growth and the expanding use of natural resources. Wilson predicts that after an overshoot of 10 to 12 billion people on the planet, which he acknowledges is a significant ecological burden, human population will decrease, and technological advances will shrink the ecological footprint. He also believes that we will “come awake,” and recognize the destruction we have wrought, and because of evolving altruism due to group selection, we will eventually embrace all of life and do no further harm to the Earth.

I highly recommend this thoughtful, well-written, in-depth treatise on biodiversity. It belongs in your library.



KANSAS ACADEMY OF SCIENCE

ATTN: Sam Leung

Stoffer Science Hall Room 312C

1700 SW College Ave

Washburn University

Topeka, KS 66621-1117

MAIL TO: