ISCB

NEWSLETTER

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COVID-19, conservation, and us

Dear members of the Israeli Chapter of the Society for Conservation Biology,

It has been a while since we last sent you a newsletter and it seems like the world we live in today is very different to that which we left behind only a few months ago. The global COVID-19 pandemic is challenging fundamental aspects of our daily lives that we took for granted only a short while ago. The wholesale behavioural changes we are experiencing are truly demanding. Nevertheless, be these changes self-imposed or enforced they may also provide us with important lessons for the future. Tackling the impending climate and biodiversity crises will most-likely necessitate comprehensive behavioural changes in all sectors of our societies and daily lives. COVID-19 could therefore teach us how such changes could and should be enacted. As the entire world focuses on public health concerns, we need to remember and target other challenges the near-future has in store for us. We dedicate most of this newsletter to affects and consequence of COVID-19 on nature and its protection in Israel.

From a more local perspective, we have recently elected a new board of the ISCB, and I would like to take this opportunity to welcome Mr Amir Lewin and Dr R.G. Bina Perl to it and thank Dr Tania Bird and Ms Yafit Brenner for staying on to help promote the ISCB's mission. Their dedication to promote conservation in Israel is commendable. I am also grateful to them all for their efforts towards producing this newsletter.

Sincerely,
Uri Roll

Exploring nature without leaving your home

For most of us, our passion for conservation is rooted in a love of nature and the outdoors. Certainly we would much rather explore the countryside instead of being stuck at home. This is especially true with spring upon us, which is usually a time for camping and hiking Israel's many trails, picnicking in KKL pine forests, and observing migrating birds. However, as conservation scientists (and parents, children and grandchildren) we know that now is the time for most of us to stay at home in order to slow the spread of COVID-19. Unfortunately we must postpone these outdoor adventures temporarily, but instead, we can still explore the world online, through virtual tours, webcams, and sound recordings. Here's how:

You can take virtual tours of these American National Parks including the Kenai Fjords in Alaska, Hawaii Volcanoes National Park, Carlsbad Caverns in New Mexico, Utah's Bryce Canyon, and Dry Tortugas in Florida. Tours include narrations by park rangers, and 360-degree video experiences. You can watch a whale breach, listen to the sound of icebergs, soar over the world's most active volcano in a helicopter, take flight with thousands of Brazilian free-tailed bats, explore the nightsky in one of the darkest places in North America, and plunge into the ocean for a tour of a shipwreck. You can also take 360-degree Google Earth tours of national parks and monuments, and virtually explore the world with these photo tours by taking a train excursion through the Canadian Rockies, discover Yosemite off-season, or the magical wildlife of the Galapagos Islands.

It's also possible to see all kinds of animals through webcams and livestreams at these wildlife centers, aquariums and zoos, and watch from hundreds of livecams from around the world of African animals around watering holes, brown bears in Alaska feeding on spawning salmon, nesting bald eagles, and the chance to spot migrating orca whales. Or merely select from Lonely Planet's nine best wildlife webcams to enjoy from the comfort of your couch, and this footage of the amazing diversity of animals crossing a log above a stream in the Pennsylvania wilderness over the course of a year. Closer to home in Israel, you can view 24 hour streams of these nesting birds of prey.

If you wish to truly immerse yourself in other worlds, then try the US National Park Service library of park sounds, which includes a variety of bird sounds, animal calls, and different natural and wildlife soundscapes, like this tundra soundscape from Rocky Mountain National Park.

How is the pandemic affecting conservationists?

We spoke to several conservationists to find out how the pandemic has affected their ability to conduct conservation science:

"While the entire country is in lockdown, my fieldwork season is busier than ever. The breeding birds are still breeding, enjoying the good conditions after blessed winter rains; migrant birds are still using stopover sites to refuel and rest. When the pandemic crisis broke, funding for several research and monitoring projects was withdrawn or postponed. This was coupled with a serious decrease in the size of our team, with a pause in employment of temporary and seasonal field technicians. Therefore, those few projects that are still running are carried out by fewer permanent staff, including myself. These weeks, I am spending more time than ever in the field, working in isolation or keeping a safe distance from others. I feel fortunate to be able to work in the field, but am looking forward to the end of this field season - I am exhausted! Additionally, because of the unexpected intensity of fieldwork, I partially neglect my regular responsibilities, that include report and paper writing, analysis, and development of new directions and actions."

Dr Yoav Perlman,
Science Director
Israel Ornithological Center
SPNI

"As the rest of us, we had to put our work on hold for a month (and counting). The momentum came to a sudden halt, and work plans will have to be rearranged in order to make up for the lost time. Luckily for us, the sampling season has not started yet, so we may be able to complete most of our planned tasks for this summer. I also believe that this experience will have a dramatic effect on the mindset of people, with greater appreciation for nature, open spaces and a healthier environment. Hopefully, it will assist us conservation biologists, to get peoples' attention more easily than ever before."

Dr Yaron Hershkovitz,
Managing Director
Israel Center for Aquatic Ecology

"If to quote from an old commercial, the lab work during these days feels like the rabbit standing beside the energizer rabbit: The manpower reduction has made us slow down lab work considerably or even completely halt it. We are struggling to keep the field monitoring going on, as there's no possibility to postpone it, but it's really difficult. I am also worried about the possibility that future budgets for environmental projects will dwindle sharply with the looming economic crisis. Also we are working alone with much less social interaction, using private cars in order to get to work more often due to inadequate public transportation. On the other hand, there are a multitude of positives: the ability to complete leftover tasks from the last couple of years; the silence emanating from the street under the lab's window; the reduced air pollution in TA and the improved view towards Samaria and the quiet fieldwork during spring."

Gilad Ben Zvi,
Lab Manager
The Entomological Lab for Applied Ecology
Steinhardt Museum of Natural History

"At the Maarag we are continuing to conduct our annual field monitoring for the State of Nature survey and for Ashalim and Evrona as planned, albeit with reduced manpower. We faced some technical difficulties including restrictions on field teams, and vehicle sharing, making it challenging for the Maarag staff to get to the field, but found solutions and we are on schedule."

Ittai Renan,
Director of HaMaarag
Steinhardt Museum of Natural History
TAU

Nature staging a comeback

There are several silver lining stories from around the world of benefits to the environment due to life in lockdown. These include huge reductions in greenhouse gas emissions, cities reporting their highest air quality levels in decades, and stories of wildlife reclaiming urban areas. While the world may indeed be cleaner and quieter, it seems that people are also finally taking the time to notice the world around them. Hopefully, one of the potentially positive outcomes that will persist long after this global pandemic is the way we consider, appreciate and interact with nature. We compiled reports of some of these positive impacts on the environment (our personal favourite is of penguins descending the streets of Cape Town):

Jackals in Ha-Yarkon Park

- Watch: Penguins on the loose in SA's empty streets
- Sea turtles are thriving as coronavirus lockdown empties Florida beaches
- Jackals roam deserted Tel Aviv park after virus forces public indoors
- Coronavirus: Goats take over empty streets of seaside town
- Lounging lions in South African park take advantage of lack of tourists
- Carbon emissions are falling, but still not enough, scientists say
- How clean air cities could outlast COVID-19 lockdowns
- Emboldened wild animals venture into locked-down cities worldwide
- Human life is literally quieter due to Coronavirus lockdown
- NASA satellite sees air pollution drop over northeastern US amid coronavirus outbreak
- The real reason we're seeing more wildlife during the pandemic
- Himalayas visible from India for first time in 30 years
- Elephant seals take over beach at Point Reyes for the second time this year
- The world's largest coronavirus lockdown is having a dramatic impact on pollution in India
- There's an unlikely beneficiary of coronavirus: The planet
- Coronavirus: Air pollution and CO2 fall rapidly as virus spreads
- Will COVID-19 have a lasting impact on the environment?
- The coronavirus is showing us how clean the air can be if electric cars were the norm
- UK wildlife enjoys humans' lockdown but concerns raised over conservation
- Jellyfish seen swimming in Venice's canals

Biodiversity and human health

By Yafit Brenner

"Whoever wishes to investigate medicine properly, should proceed thus: in the first place to consider the seasons of the year, and what effects each of them produces… we must also consider the qualities of the waters, for as they differ from one another in taste and weight, so also do they differ much in their qualities… and the ground, whether it be naked and deficient in water, or wooded and well watered… "

Hippocrates

The connection between human health and nature's underlying biodiversity is reciprocal and multilayered. Perhaps most relevant to the current pandemic are zoonotic diseases, which are transmitted by animals, both wild and domesticated. In general, with greater biodiversity, the larger the number of different species and the overall lower abundance of any particular species that may act as vectors or reservoirs. This lowers the probability of pathogens spreading and causing human infections[1,2]. Of course, the opportunity of pathogens spreading to humans greatly increases when animals are removed from their natural habitats to be sold for consumption, and with growing human encroachment on these habitats. These major factors, overexploitation and habitat destruction, threaten not only biodiversity but human health as well.

Biodiversity refers not only to large organisms but to microorganisms as well, including pathogens and viruses[1,3]. The more diverse a microorganism ecosystem, the more pathogens and viruses that appear. This encompasses genes at the molecular level, and the differentiation of new pathogenic species and forms of disease. However, while nature and its biodiversity may be the source of harmful microorganisms such as COVID-19, it is also the source of medicines and preventive solutions[4].

The term biodiversity also applies to the various different organisms one comes in contact with as a child. Commonly referred to as the "hygiene hypothesis", at a young age, exposure to various antigens makes the immune system stronger and less prone to health issues such as asthma and eczema[5].

A less thought of aspect of biodiversity is food diversity. A diverse diet provides vitamins, minerals and other important building blocks vital to our immune system and everyday bodily functions[6]. We might think of hunter-gatherer societies whose diverse diet maintains a strong connection to nature[7]. Unfortunately, a lack of variety in food, i.e. malnutrition, is a problem of many urban and underprivileged groups in both the developed and developing worlds alike[8]. The importance of biodiversity to human health is further emphasized when accounting for invaluable ecosystem services, like the pollination of various plants, and agricultural crops by different bee species and other animals[9].

Health also refers to psychological health, which

in-turn is influenced by the environment. For example, food security, which might reduce anxiety, or the risk of flooding, inducing stress. In addition, nature is a source for relaxation and recharging[10]. Such services and more are provided by stable ecosystems, reliant on biodiversity, at all of its trophic levels and interactions. It is evident perhaps now especially that biodiversity is an integral factor when considering our health. This is part of a holistic approach, taken by the World Health Organization[11]. One well known to us ecologists, as much as it was to Hippocrates, the father of medicine, over two thousand years ago.

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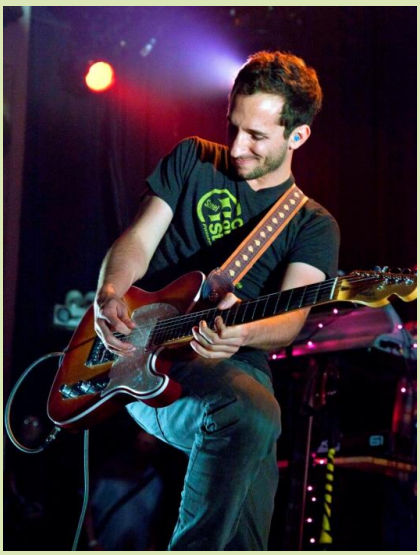
Spotlight on Dr Michael Roth

Nuclear power, energy policy and the environment

By Amir Lewin



Mike Roth completed his PhD at Carnegie Mellon University's Department of Engineering and Public Policy, researching energy policies shaping the U.S. energy system, with a special focus on quantifying the role of nuclear power as an effective carbon avoidance strategy. He is currently a postdoc in Alon Tal's research group at Tel Aviv University's Department of Public Policy. Dr Roth's research will focus on possible low-carbon scenarios for Israel's energy system from 2020-2050. Lowering CO_2 emissions will be challenging in Israel given that the population is expected to double by 2050. We spoke with him to learn about some aspects of his research in the U.S. and his future research plans in Israel.

Some background:

Nuclear power plants in the U.S. account for roughly 20% of national electricity generation. Many nuclear plants are at risk of premature closure due to recent decreases in electricity prices mainly from an abundance of natural gas due to hydraulic fracturing and to a lesser extent from increased renewable generation. Additionally, nuclear power faces some political opposition due to perceived threats from nuclear waste. However, other sources of electricity including coal and natural-gas have higher carbon footprints than nuclear power as well as other social costs, mainly human health impacts from the emission of local air pollutants. Therefore, it is important to evaluate the role of nuclear power as a mechanism to avoid CO_2 emissions, which are essential to mitigating climate. In their recent paper - Going nuclear for climate mitigation: An analysis of the cost effectiveness of preserving existing U.S. nuclear power plants as a carbon avoidance strategy, Dr Roth and his co-author, Dr Paulina Jaramillo, demonstrate that nuclear power production in the U.S. could be economically viable when accounting for the cost of avoided CO_2 emissions (i.e. the cost of CO_2 emissions that would be produced by another energy source such as coal or natural gas). Roth and Jaramillo modeled the "missing-money payment" that each nuclear power plant would need in order to break even under different future electricity price scenarios from 2015-2040. Additionally, they take the total "missing-money payment" at each plant and divide it by the total

CO_2 emissions that would have been produced had the electricity instead been generated by a natural gas combined cycle power plant, thus calculating the cost of avoided CO_2 emissions. After doing the math, they find that preserving even the least financially viable nuclear power plants in operation under the lowest electricity price scenarios would present a cost effective carbon-avoidance strategy.

Mike's paper focuses mainly on the cost of preserving nuclear power plants in order to avoid increases in CO_2 emissions. So we asked – what are some of the other social and environmental costs associated with nuclear energy, such as waste and nuclear disasters?

"With regards to storing spent nuclear waste, the perceived risk is not understood well by the general public. The total amount of spent fuel produced from all U.S. nuclear power plants could roughly fit on one football field stacked less than 10 meters high. Of course, the fuel is not stored like this, but rather inside dry casks on-site at each nuclear power plant across the U.S. We are already stuck with spent-fuel, and since it is well contained and does not take up much space, adding to the waste total may not be a problem. With regards to the health, social, moral and psychological costs associated with nuclear disasters – I do not intend to demean them, but these need to be thought about carefully and the relative impacts put in perspective. For example, the 2011 tsunami that led to the Fukushima disaster in Japan directly killed thousands of people, but there has been only one reported death from radiation exposure. Admittedly, while the true environmental impact is unknown (and may never be known), such failures should be attributed to poor management and human error, which can be remedied in order to prevent future disasters. When comparing methods for generating electricity it is important to examine the social and environmental impacts across sources. For example, the damage from the emission of local air pollutants in the U.S. totaled $790 billion (2018 U.S. dollars) in 2014. Specifically, work by Marshall et al. found that air pollution from electric generation led to 14,000 premature deaths in 2014. In addition, greenhouse gas emissions from energy production are massive and include ecosystem damages resulting from climate change."

In your paper you discuss some tools for quantifying and comparing environmental costs and benefits, can you elaborate on these?

"Well foremost, externalities (usually negative consequences of economic activity that are not incorporated into the price of a commodity) are seldom included in the cost of energy production. In our paper on the costs of preserving nuclear power plants, we quantify the cost of CO_2 that nuclear power plants avoid in order to achieve a truer economic account of nuclear energy. Still some other externalities such as those listed in my previous answer (pollution and health effects, habitat destruction, biodiversity loss, noise, stress, etc.), once internalized would incentivize energy production towards cleaner and more sustainable energy practices like wind, solar, and nuclear because

these have lower environmental costs. Including external costs in cost and benefit considerations is important when deciding the best course of action, which I believe are ultimately commensurate with environmentally sustainable practices."

Can you help us understand some government and market tools for regulating carbon emissions?

"A carbon tax proportional to the damage caused by CO_2 emissions is an economically efficient and straight forward policy tool that could be used towards reducing carbon emissions. However, any tax especially on carbon is politically unattractive. Another popular mechanism is a "cap and trade" system whereby permits are issued that allow a specific amount of a pollutant to be emitted, which can be traded by emitters. This should incentivize companies to become more efficient by reducing their carbon emissions in order to save the cost of having to buy carbon permits and/or allowing them to profit by selling their permits to less efficient companies. In time, governments or other bodies could buy back or reduce the number of emissions permits thereby reducing the level of CO_2 allowed to be emitted. This is a very feasible system, which has actually been used effectively in the U.S. For example, in the 1990's a SO_2 cap and trade system was implemented under the Clean Air Act, which greatly reduced SO_2 emissions in a cost effective way, even exceeding expectations."

What is the role of academic research in shaping public policy and the environment?

"I do believe in the ability of research, when communicated clearly, to influence policy makers' views on energy and environmental policy. I've observed this with my own research on nuclear energy and climate goals, which attracted some journalistic coverage – read, How Retiring Nuclear Power Plants May Undercut U.S. Climate Goals. A moment that resonated deeply for me is when my representative in Congress from Pennsylvania, Mike Doyle, referenced the importance of nuclear power in providing energy and mitigating climate change during a town hall on energy security, even in the face of an audience that clearly opposed this viewpoint. I'm not sure whether my work informed his climate policy views on nuclear, but it did reinforce my belief that good science can make a difference in positively impacting opinions and reaching decision makers."

Tells us about some of your future research plans here in Israel.

"I'm interested in the trade-off between energy security challenges while meeting commitments to the Paris Accord, to which Israel is a signatory. Israel faces unique energy challenges due to a rapidly increasing population, which will likely double by the year 2050. This significant increase in population will be coupled with increases in energy demand. Meeting growing energy demands without imports and in a low-carbon manner could be challenging for Israel in the future. Recently discovered natural gas resources are predicted to be depleted within several decades. Energy availability and security in Israel will underlie a suite of other challenges ranging

from food, industry, defense, and water challenges – ultimately impacting and dictating our quality of life and the environment. Israel is also uniquely positioned to address these challenges, but it will require a collection of innovative technological, social and policy solutions. I started my postdoc in February and have been excitedly meeting with energy experts to help determine the direction of my work here."

We turned to Greenpeace Israel to hear their response to Dr Michael Roth's research:

"Nuclear energy is not an option for the future of the energy world. It was not an option before the climate crisis became so salient and it is no more today. It is irresponsible to change one threat by another: mitigating the climate crisis by creating thousands of dangerous nuclear plants that will be active and create nuclear waste that future generations will have to deal with for thousands of years. Nuclear energy has many hidden costs. Ensuring security of nuclear facilities, confinement of nuclear waste for so many years are a few examples of those hidden costs that make investment in building new nuclear plants ridiculous in an era where renewable energy prices are rapidly dropping. Today, renewable energy is already cheaper than any other source and the trend will be stronger in the future, what makes the decision to advance nuclear energy a pure political and non-logical one."

Greenpeace Mediterranean, Israel

Recent publications in Israeli conservation

Shalmon, B., Sun, P., and Wronski, T. 2020. Factors driving Arabian gazelles (*Gazella arabica*) in Israel to extinction: time series analysis of population size and juvenile survival in an unexploited population. *Biodiversity and Conservation*, 29, 315-332.

Colleony, A. and Schwartz, A. 2019. When the winners are the losers: Invasive alien bird species outcompete the native winners in the biotic homogenization process. *Biological Conservation*, 241, 1-9.

Zaitzove-Raz, M., Comay, O., Motro, Y. and Dayan, T. 2020. Barn owls as biological control agents: potential risks to non-target rare and endangered species. *Animal Conservation* https://zslpublications.onlinelibrary.wiley.com/doi/abs/10.1111/acv.12576.

Becker, N. 2020. How much is the designation of a new biosphere reserve worth? Landsenses ecology valuation evidence from Israel. *International Journal of Sustainable Development & World Ecology*, 27, 224-232.

Van Rijn, I., Kiflawi, M., and Belmaker, J. 2020. Alien species stabilize local fisheries catch in a highly invaded ecosystem. *Canadian Journal of Fisheries and Aquatic Sciences*, 77, 752-761.

Yeruham, E., Shpigel, M., Abelson, A., and Rilov, G. 2020. Ocean warming and tropical invaders erode the performance of a key herbivore. *Ecology*, 101, e02925.

Shoham-Frider, E., Gertner, Y., Guy-Haim, T., Herut, B., Kress, N., Shefer, E., and Silverman, J. 2020. Legacy groundwater pollution as a source of mercury enrichment in marine food web, Haifa Bay, Israel. *Science of The Total Environment*, 714, 136711.

Cohen, Y., Bar-David, S., Nielsen, M., Bohmann, K., and Korine, C. 2020. An appetite for pests: Synanthropic insectivorous bats exploit cotton pest irruptions and consume various deleterious arthropods. *Molecular Ecology*, 29, 1185-1198.

Giladi, I., and Ziv, Y. 2020. The efficacy of species-area relationship to indicate fragmentation effects varies with grain size and with heterogeneity. *Ecological Indicators*, 110, 105904.

Lawson, J. M., Pollom, R.A., Gordon, C.A., Barker, J., Meyers, E.K., Zidowitz, H., Ellis, J.R., Bartolí, Á., Morey, G., Fowler, S.L., Jiménez Avarado, D., Fordham, S.V., Sharp, R., Hood, A.R. and Dulvy, N.K. 2020. Extinction risk and conservation of critically endangered angel sharks in the Eastern Atlantic and Mediterranean Sea. *ICES Journal of Marine Science*, 77, 12-29.

Alon-Mozes, T. 2020. Outdoor Recreation in Israel from the Early 1950s to the 1970s: From nation building to landscape consumption. *Journal of Planning History*, 19, 3-25.

Announcements

- SCB is excited to offer ten Graduate Student Research Awards to support students whose research advances the science and practice of conserving Earth's biodiversity.
- Due to the COVID-19 pandemic, upcoming workshops and conferences have been postponed. We will update you on the status of these via our Facebook page and future newsletters.

The Israeli Chapter of the Society for Conservation Biology (ISCB) is a professional non-profit organization that aims to promote the science of conservation. It is affiliated to the SCB and is managed in accordance with its goals and guidelines. Members of the ISCB are practitioners, academics, and all other individuals interested in the multi-disciplinary field of conservation.

ISCB Board Members

Dr Uri Roll (President);
Dr Tania Bird (Vice-President);
Dr R.G. Bina Perl (Secretary);
Amir Lewin (Communications Director);
Yafit Brenner (Treasurer)

If you would like to share your thoughts and comments with us, and contribute to the ISCB or to our future newsletters, then we would be happy to hear from you. Please send us your conservation news and research updates.

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