

German-Israeli Climate Talks: The Effects of Climate Change on Birds & Bird Migration

November 30th – December 2nd, 2014

Tel-Aviv University, Beit HaTfutzot Hall and the Hula Valley, Israel



Cranes in the Hula Valley
(Photo: Dror Galili)



Sooty Falcon in the Negev Desert, Israel
(Photo: Thomas Krumenacker)



Sinai Rosefinch in Eilat Mountains
(Photo: Thomas Krumenacker)



Atlantic Puffins near Egg Rock, near Hog Island, Maine, USA
(Photo: Tom Johnson)



Snowy Owl with GPS transmitter (Photo: Alan Richard)



Hume's Tawny Owl, Judean Desert, Israel (Photo: Ronni Livne)



Climate talks objectives:

1. To learn and discuss the impact of climate change on bird migration.
2. To discuss sustainable politics and policy in the framework of "research for the people".
3. To expose the subject to the academia, conservationists, decision-makers, the public and the media.

Climate talks organizers:

- German Embassy Tel-Aviv, Israel
- Tel-Aviv University, Faculty of Life Sciences, Dept. of Zoology
- The Society for the Protection of Nature in Israel (SPNI)

Sleeping arrangements:

November 30th, 2014 Tel-Aviv,
Dan Panorama Hotel

December 1st, 2014 Hula Valley,
Kfar Blum - Pastoral Hotel
(<http://www.kfarblum-hotel.co.il/>)

Invited guests:

1. **Prof. Franz Bairlein**, Director of the Institute of Avian Research, Vogelwarte Helgoland, Germany, migration expert
2. **Dr. Leo Zwarts**, the Netherlands
3. **Mr. Scott Weidensaul**, Ornithologist and author (of over two dozen books), USA
4. **Jordanian representative**



Negev Desert (Photo: Thomas Krumenacker)

5. **Mr. Thomas Krumenacker**, Reuters journalist and bird photographer, Berlin, Germany

Speakers and Experts from Israel:

1. **Dr. Sinaia Netanyahu**, Chief Scientist, Ministry Environmental Protection
2. **Prof. Yoram Yom-Tov**, Dept. of Zoology, Tel-Aviv University
3. **Prof. Pinhas Alpert**, Department of Geophysical, Atmospheric and Planetary Sciences, Tel-Aviv University
4. **Prof. Marcelo Sternberg**, Department of Molecular Biology & Ecology of Plants, Faculty of Life Sciences, Tel-Aviv University
5. **Prof. Uriel Safrieli**, Hebrew University

Climate talks contact persons:

1. **Prof. Yossi Leshem**, Tel-Aviv University and SPNI, Director of the International Center for the Study of Bird Migration
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2. **Ms. Gabriele Hermani**, Science Counselor at the German Embassy, Israel
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3. **Ms. Adi Bashan** and **Ms. Galit Tal**, Tel-Aviv University (Organizer)
yleshem@post.tau.ac.il
4. **Mr. Dan Alon**, Head of Israel Ornithological Center, SPNI ioc@inter.net.il



Polar Bear (Photo: Amir Balaban)



Participants in Workshop



David Leffler, Director General of the Israel Ministry of Environmental Protection since 2013. Previous positions in the public Service include: Director General – Israel Ministry of Science, Director General – Israel Ministry of Culture and Sport, Director General - Government employment service, Member of directorate - Israel Electric Company, Member of directorate - IMI - Israel Military Industries. Mr. Leffler holds a masters in Business Administration and MA in Political Science.



Andreas Michaelis His Excellency was born 1959 in Hannover. In 1989 he entered into the German Foreign Service. He is the Ambassador of the Federal Republic of Germany to the State of Israel since July 2011.



Prof. Joseph Klafter has served as President of Tel-Aviv University since 2009. Prior to that, he chaired the Israel Science Foundation from 2002 to 2009, and twice chaired the Department of Physical Chemistry at TAU. The incumbent of the Heineman Chair of Physical Chemistry, and currently a member of the American Academy of Arts and Sciences, he is the recipient of many prestigious prizes and honors, and has published nearly 400 scientific articles and edited 18 books.



Prof. Franz Bairlein, is Director of the Institute of Avian Research in Wilhelmshaven, Germany, and professor at the University of Oldenburg. He served as President of the German Ornithologists' Society and the International Ornithologists' Union, and is currently President of the European Union for Bird Ringing. Franz's research focus is bird migration ranging from field studies along the migration routes to the physiological control and molecular mechanisms of migratory behavior.



Prof. Pinhas Alpert, Chair Professor in Geodynamics at the Department of Geosciences in Tel-Aviv University, Faculty of Exact Sciences. Served as Head of the Porter School for Environmental Sciences at Tel-Aviv University (2008-2013) and former Israel representative to IPCC WG1. He is NASA Goddard Fellow and Honorary Member of the World Jewish Academy of Sciences.



Dr. Leo Zwarts worked as ecologist at Rijkswaterstaat from 1976 to 2005. Since 2005 working as consultant for Altenburg & Wymenga. Did much fieldwork in West Africa since 1982, first during several scientific expeditions. Since 1998 working together with Wetlands International, Insitute for Environmental Studies, Direction Nationale de l'Hydraulique, Alterra, A&W, Royal Haskoning Anthea Group and BirdLife International on eight large projects, mainly on the relationship between hydrology, ecology and economy.



Scott Weidensaul is the author of more than two dozen books on natural history, including the Pulitzer Prize finalist "Living on the Wind: Across the Hemisphere with Bird Migration," and "Return to Wild America: A Yearlong Search for the Continent's Natural Soul," and is a contributing editor for Audubon magazine. He coordinates ornithological programs for Audubon's historic Hog Island Camp on the coast of Maine, and lives in the Appalachian Mountains of Pennsylvania, where he studies the migration of hawks, owls and hummingbirds. Weidensaul co-directs Project OwlNet, a cooperative network for more than 125 owl-banding sites across North America, and Project SNOWstorm, which tracks the movements of snowy owls.



Dr. Stephen Kress is Vice-President for Bird Conservation for the National Audubon Society, Manager of the Society's Maine Coast Seabird Sanctuaries and Director of the Hog Island Audubon Camp. As Director of Audubon's Seabird Restoration



Program, he develops techniques for managing colonial nesting seabirds. His research interests focus on the foraging ecology of alcid and terns. Hundreds of professional seabird biologists can trace their first interest in seabirds to working with Dr. Kress during his 40 years of seabird restoration. Methods first developed in Maine such as seabird chick translocation and social attraction are now standard practice for seabird conservation worldwide.



Prof. Marcelo Sternberg works at the Department of Molecular Biology and Ecology of Plants at Tel-Aviv University, and served as Chairman of the Israel Society of Ecology and Environmental Sciences from 2010 to 2012.

He is the team leader of the Biodiversity section at the Israel Climate Change Information Center. Marcelo is an ecologist interested in the effects of global climate change on natural ecosystems.



Prof. Yoram Yom-Tov is a professor emeritus at the Department of Zoology in Tel-Aviv University. He served as advisor to dozens of graduate students working on their master and Ph D. theses. He published several

books and more than 200 scientific articles on zoogeography, bird migration, behavioral ecology, and comparative zoology of birds and mammals. He is deeply involved in nature conservation in Israel.



Prof. Uriel Safriel is a professor emeritus at the Department of Ecology, Evolution and Behavior of the Hebrew University in Jerusalem, Head of the Center for Environmental Conventions of the Blaustein

Institutes of Desert Research and Chair of the Committee of Science and Technology of the UN Convention to Combat Desertification and is currently leading the Israel National Ecosystem Assessment project.



Thomas Krumenacker, 49, is a journalist working with Reuters in Germany for nearly 20 years. He is also a member of the German Association of Nature Photographers and a columnist for birding magazines and

nature photography publications. Thomas visited Israel more than 30 times in the recent years. His work has been published widely in books and magazines and has been put on exhibition in various places internationally, among them the Israeli Knesset. In cooperation with the IOC Thomas recently published an analysis of 30 years of systematic bird counts in Israel.



Prof. Yossi Leshem, Professor in the Department of Zoology at Tel-Aviv University. Worked at the Society for the Protection of Nature in Israel (SPNI) since 1971, the leading NGO in Israel. Was the CEO between 1991-1995.

The founder and Director of the International Center for the Study of Bird Migration. Is involved in a variety of activities in bird migration research, in educational activities, and cooperation with the Palestinians and the Jordanians, titled "Migrating Birds Know No Boundaries". Leads a regional project. using Barn Owls and Kestrels as biological pest control agents.



Dr. Sinaia Netanyahu is the Chief Scientist in the Ministry of Environmental Protection. In this capacity, her office supports academic and applicative driven environmental research, climate change, etc. Previously, Sinaia

served as a lecturer in both the Ben-Gurion University and the Hebrew University, and was the Director of Environmental Sustainable Finance at TAHAL Group. Sinaia holds a Ph.D. in Agricultural and Resource Economics from the University of Maryland, USA.



Gabriele Hermani was born 1960 in Frankfurt am Main. She studied Political Sciences at the Free University in Berlin and Theater Sciences at the Johann-Wolfgang von Goethe University in Frankfurt. The

former journalist (Frankfurter Allgemeine Zeitung F.A.Z) and spokeswoman wrote several books about economic and political issues. As October 2013 she is working as science councillor at the German Embassy in Tel-Aviv, Israel.



Program

Sunday, November 30, 2014

Arrive in Tel-Aviv to Dan Panorama Hotel.

19:30 Dinner with invited guests hosted by the German Ambassador, H.E. Andreas Michaelis and esteemed guests (up to 20), at Tamar Hall, Dan Panorama Hotel

Monday, December 1, 2014

Lecture day at Tel-Aviv University, Beit HaTfutzot Hall, hosted by **Mr. David Leffler** Director General of the Israel Ministry of Environmental Protection

8:00-8:30 Meeting and refreshments

8:30-9:00 Greetings:

Conveners:

Prof. Yossi Leshem

Ms. Gabriele Hermani

6 minute video on the subject

- **Eyal and Tal Bartov**

Prof. Uriel Safriel, opening

H.E. MK. Amir Peretz,

Minister for the Protection of the Environment

Prof. Joseph Klafter, President of Tel-Aviv University

H.E. Andreas Michaelis,

Ambassador of the Federal Republic of Germany to Israel

Jordanian Representative

The role of birds, environment, and climate change in the peace process



In the Senegal Delta the value of shallow, brackish lakes, such as Grand Lac and Lac du Khar in the Djoudj NP and the Bell basin in the Diawling NP, depends largely on their protection of waterbirds from exploitation by man. (Photo: Hans Hut)

First session

Convener, **Mr. Thomas Krumenacker**

9:00-9:40 Keynote speaker, **Prof. Franz Bairlein** - Migratory species in the wake of climate change

9:40-10:05 **Prof. Pinhas Alpert** - Regional climate change and potential impacts on bird migration

10:05-10:30 **Dr. Leo Zwarts** - Living on the edge: Wetlands and birds in changing Sahel, Africa

10:30-10:55 Coffee break

Second session

Convener, **Dr. Sinaia Netanyahu**, Chief Scientist, Ministry for the Protection of the Environment

10:55-11:20 **Mr. Scott Weidensaul, Steve Kress** - The effect of climate change on oceans and bird populations

11:20-11:45 **Prof. Marcelo Sternberg** - Impacts of climate change on biodiversity in Israel - known and unknown in a time of uncertainty

11:45-12:05 **Prof. Yoram Yom-Tov** - The impact of global warming on body size of birds and mammals

12:05-12:40 Panel - discussion with questions from the public, Moderators:

Prof. Uriel Safriel and **Dr. Sinaia Netanyahu**



Ruffs concentrated in the last remaining wet sites in a dusty Sahel (Photo: Jan Wijmenga)



The moving hide with the wintering Cranes in the Agmon Hula Valley (Photo: Yossi Eshbol)

Excursion

12:40-15:15 Drive to the Agmon Hula Valley (lunch boxes on bus)

15:15-15:50 Refreshment in Agmon Hula Cafe

15:50-17:15 Guided tour tracking 30,000 Common Cranes in flight to their nocturnal roost site, at the Agmon Hula Valley

17:30 Check-in at Kfar Blum Pastoral Hotel

Excursion participants

Dr. Leo Zwarts, Prof. Pinhas Alpert Prof. Franz Bairlein Dr. Sinaia Netanyahu, Prof. Marcelo Sternberg, Prof. Uriel Safriel, Prof. Yoram Yom-Tov, Mr. Scott Weidensaul, Mr. Thomas Krumenacker, Prof. Yossi Leshem, Gabriele Hermani, Dan Alon as well as interested Israeli or international media

After Dinner:

Mr. Thomas Krumenacker - Climate change - What is at stake in Israel: Israel's birdlife seen through the lens of a photographer, questions and discussion

Tuesday, December 2, 2014

5:30-7:30 Follow the Cranes leaving the night roost site at the Agmon Hula Valley

7:30-8:30 Ringing station at the Agmon

09:00-10:00 Breakfast

10:00-13:00 Tour to the Jordan River to show impacts of climate change by Dr. Gonen Sharon, Director Prehistory Laboratory, Tel Hai College, Upper Galilee

13:00-14:00 Lunch in Kfar Blum

14:00 Drive to Ben-Gurion Airport



Greater Spotted Eagle Attacks Imperial Eagle in the Agmon Hula Valley. Both eagles are globally endangered species (Photo: Thomas Krumenacker)



The Inner Niger Delta, one of the largest floodplains in Africa. An area of the same size as Israel is annually inundated during the wet season (Photo: Leo Zwarts)



Migratory species in the wake of climate change

..... **Franz Bairlein**

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Birds are affected by global warming. Many migratory birds arrive earlier at breeding grounds in spring, and do have either advanced or delayed autumn departure. During migration migrants are increasingly confronting a mis-timing of spatio-temporal events due to regional variation in climate change, and climate-driven changes at the non-breeding grounds such as changes in rain patterns. Global warming is considered to reduce the predisposition to migrate in short to medium distance migrants which will result in bird communities that will be increasingly dominated by non-migrating and short to medium distant migratory species. Recent geographical range shifts of migratory species are linked to climate change, and an increase in species richness in temperate, boreal and arctic regions is also expected while species richness is likely to decline in more arid regions due to increased temperature and decreased precipitation. Many species breed earlier today, and there are cases of climate driven mis-timing between onset of breeding and peak abundance of prey, with considerable impacts on the fitness of the birds and consequently their populations. Nutritional mismatches during the breeding season are recognized important but similar studies at the wintering grounds or at stopover sites are almost missing. However, there is evidence that nutritional bottlenecks due to climate-induced changes of dietary quality are likely to affect migratory performance, winter survival and subsequent breeding as well.

Though we do see numerous fingerprints of climate change in migratory species we still lack a comprehensive understanding of the causes and consequences of climate change. Crucial questions for a better understanding of climate change on birds are: (1) how does climate influence migratory birds functionally, and (2) what are the consequences of these changes for the future of migratory birds. This will also help to evaluate the effects of climate change on migratory birds in the light of the many other environmental changes such as habitat deterioration.



*Osprey hunting in Finland
(Photo: Adit Merkinė)*



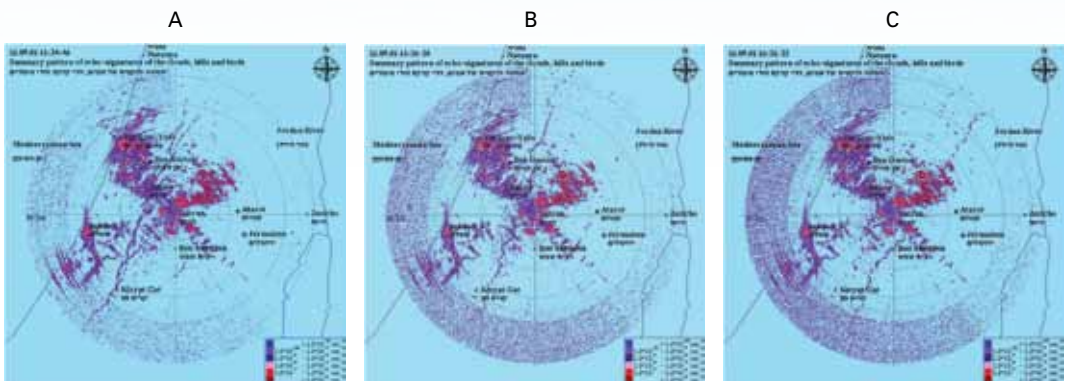
Regional climate change and potential impacts on bird migration

Pinhas Alpert

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Birds are a most sensitive sensor to atmospheric conditions, often even more than what weather stations measure, like vertical wind (upward motion) which is a very problematic variable to measure in the atmosphere. For instance, it has been shown that migrating birds soaring over Israel identify the Sea-Breeze-Fronts (SBF) and actively search for the upward motion associated with the converging lines of the SBF and actively search the upward motion in their migration through the country. The figure below (from Alpert et al. 2000) shows an example from September 10th 1995 in which migrating Honey Buzzards are seen by the radar of Ben-Gurion (Tel-Aviv) International Airport as biological target lines that are very closely aligned with the SBF convergence lines.

The predicted significant regional climate changes in many of the weather variables over the E. Mediterranean, including temperature, rainfall, humidity and winds and particularly increase in the extreme events have been recently computed employing ensemble of regional climate models and different scenarios for emission of greenhouse gases (GHG) (Alpert et al., 2008, Samuels et al., 2010, 2011). These climatic changes driven largely by the global warming due to GHG increases will undoubtedly affect the migrating birds. This includes, the timing of migration and period of stay in Israel. I will review our relevant 21st century regional climate modelling predictions for this region.



*Migration wave of Honey Buzzards affected by the sea breeze, shifted to the east as documented by MRL-5 Radar at Latrun
September 11th 2001 (A) 11:34 (B) 13:35 (C) 15:21*



Living on the Edge

..... **Leo Zwarts**

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Africa is of vital importance for the long-distance migratory birds breeding between East Canada and East Asia, ranging in habitat from the Arctic tundra to the Mediterranean scrubland. A quarter of the European birds winter south of the Sahara, of which 13% show an increase, 28% are stable, but 59% are in decline. This compares unfavourably with short-distance migrants (33% in decline) and residents (28% in decline).

Not all long-distance migrants wintering in Africa are in decline. Six species show a clear increase, which can be accounted for by species-specific responses to the impact of man's activities:

- The upsurges in species like Little Egret, Osprey, Eurasian Marsh Harrier and Montagu's Harrier are recoveries from depletion in the past (due to persecution and use of pesticides), effectuated by legal protection and bans on the use of organochlorines in farming. Moreover, the lower hunting pressure on White Storks and Ospreys in North Africa and South Europe improved the annual survival rate.
- Although the Osprey is doing poorly in Sahelian wetlands, this has no impact on the population level since the large majority winters along the West African coast.
- The European Spoonbill in NW Europe has increased from 150 to 2500 pairs in the past 40 years. Wintering numbers in the Senegal Delta remained stable, but the number of birds wintering on the Banc d'Arguin (Mauritania) boomed, and an increasing number of Spoonbills nowadays remains in SW Europe to winter. Other species, such as White Stork, Eurasian Marsh Harrier and Little Egret, also increasingly winter in Europe rather than in Africa, profiting from warmer winters, new food supplies and better protection.

Hence, the increase of these six long-distance migrants is not related to circumstances in the Sahel, but rather to changes elsewhere. A flexible migratory strategy may be profitable in the wake of the ongoing and future climate change.



Palearctic provenance. Among the passerines, many accumulate in the Sahel and Sudan zones of West Africa, where they arrive after the rains and remain throughout the dry season under deteriorating conditions before embarking on the return trip to the breeding quarters. Some species, such as Red-backed Shrikes heading for the Kalahari, use the Sahel as a stopover only, and continue their flight to southern Africa (usually via eastern Africa). Yellow

Wagtails occur throughout Africa except in rainforests, with some geographical separation between subspecies (flava shown here). Whinchats, on the other hand, largely remain in the Sahel and Sudan zones. Northern Wheatears are typically confined to the Sahel, where they are very common. Wheatears from West Greenland and Canada, belonging to the 30-gram subspecies leucorhoa, cross the Atlantic Ocean in a single 4000-km flight from their breeding grounds to West Africa. (Photo: Jan Van De Kam)



Climate Change and Seabirds - Lessons from Cahows and Atlantic Puffins

..... **Stephen Kress and Scott Weidensaul**

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Rapid climate change affects seabirds by flooding of nesting islands, habitat erosion, extreme rain, acidification and impacts on forage fish. We present two case studies that demonstrate how proactive management is helping to mitigate the effects of climate change.

In Bermuda, chicks of the endangered Cahow are being moved from a few tiny, low-lying islands at risk from sea level rise to artificial burrows on a larger, higher, more erosion-resistant island. To encourage colonization of the historic site, petrel chicks were transplanted and hand-fed in artificial burrows and pre-recorded petrel vocalizations were used to attract nesting petrels.

In the Gulf of Maine, record high sea surface temperatures (SST) in 2012 and an especially warm, early spring resulted in an early plankton bloom. These conditions favored butterfish (*Pephrilus triacanthus*), a warm water species that is too large for small puffin chicks to swallow. Normally, about 77% of puffin pairs fledge chicks. In 2012, at Maine's largest puffin colony, chick survival declined to only 31%, and the 2013 nesting season was even worse, with only 10% of pairs fledging chicks. The warm water would have been more devastating except that successful fisheries management for haddock (*Melanogrammus aeglefinus*) and Acadian Redfish (*Sebastes fasciatus*) provided young fish that were just the right size for puffins.

Following the cold winter of 2013-14, SST dipped by just 1 degree C. and the plankton bloom that followed led to a more normal puffin nesting season, with 75% of pairs fledging young. We conclude that the negative effects of rapid climate change can sometimes be mitigated for seabirds by hands-on stewardship actions such as relocation of vulnerable chicks to safer nesting islands and better stewardship of a wide range of forage fish.



Marine Puffin with White Hake – a temperature sensitive species (Photo: Sandy Flint)



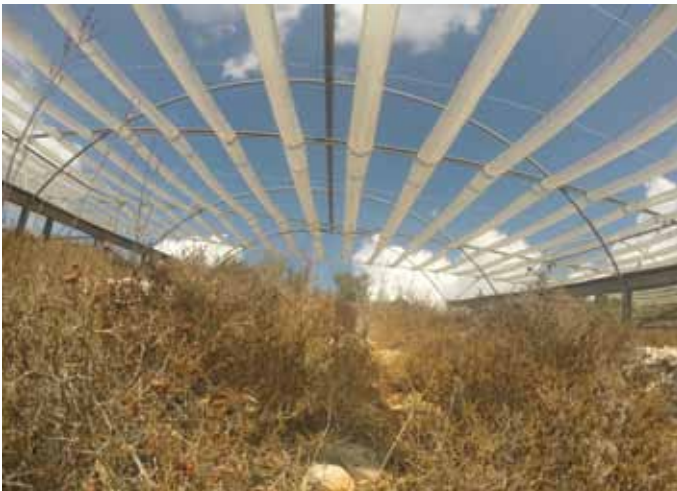
Impacts of climate change on biodiversity in Israel – knowns and unknowns in a time of uncertainty

..... **Marcelo Sternberg**

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Global climate and land-use changes are of major scientific and political concern, especially when considering their potential impacts on future biodiversity, ecosystem processes and human well-being. The Mediterranean region is both a global biodiversity hotspot and one of the biomes most strongly affected by human activities. Ecologists and land managers are increasingly required to advise on threats to biodiversity under foreseeable climate change. We used expert surveys to evaluate current understanding and uncertainties regarding climate-change impacts on biodiversity in terrestrial, inland freshwater and marine ecosystems of Israel.

The surveys and the published literature indicated that the main climate-change impacts in Israel include ongoing deterioration of freshwater habitats, decline of shrubland and woodland areas, and increased frequency and severity of forest fires. For the Mediterranean Sea the surveys predict further introduction and establishment of invasive species from the Red Sea, accelerated erosion of coastal rocky habitat, and collapse of coastal rocky platforms. Despite these predictions, science-based knowledge regarding the contribution of management towards minimizing climate-change impacts on biodiversity is still lacking. Habitat loss, degradation and fragmentation are presently the primary and immediate threats to natural ecosystems in Israel. This could have major effects on bird populations migrating over the region. Protection of natural ecosystems, including local refugia, must be intensified to maintain existing biodiversity under pressure from mounting urban development and climate change. This protection policy should include ecological corridors to minimize the consequences of fragmentation of existing natural habitats for species survival. A longer-term strategy should mandate connectivity across environmental and climatic gradients to maintain natural resilience and securing safe habitats for migrating birds.



Rainout shelters simulating drought conditions at Mediterranean and semiarid experimental site of the former GLOWA Jordan River project (Photo: Marcelo Sternberg)



The effect of global climate change on animals

..... **Yoram Yom-Tov**

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Geographical and temporal variations in body size are common phenomena among organisms and may evolve within the course of a few years. Body size acts much like a barometer, fluctuating in parallel with changes in the relevant key predictor(s).

Recent temporal changes in body size have often been related to global climate change. Global climate change may affect animals directly, through its effect on their body temperature, or indirectly, through its effect on plant growth and thus food availability to animals. Bergmann's rule states that, among homothermic animals (birds and mammals), populations and species of larger size are found in colder environments, while species of smaller size are found in warmer regions. This rule was explained as a thermo-regulatory adaptation related to surface to volume ratio: this ratio is large in small animals, which can easily dissipate heat in warm climate through their large surface area; while the small ratio of large animals enables them to conserve heat in cold environments. Thus, Bergmann's rule predicts that global warming will cause a tendency for body size to decrease.

On the other hand, the increasing ambient temperatures at high latitudes will shorten the winter and thus allow animals to conserve the energy that they spend in warming their bodies. This will also lengthen the growing season of plants and thus increase primary productivity, which will in turn increase food availability for animals. Both effects may enable animals to increase their body size.

In my talk I shall give examples of birds and mammals whose body size has either decreased or increased during the last 100 years. Some of these trends have been interpreted as resulting from global warming. However, since these observations are only correlations and not controlled experiments, such interpretation is often criticized.



*The Orange-tufted (Palestine) Sunbird, one of the smallest birds in Israel (7-8 grams)
(Photo: Thomas Krumenacker)*



The largest migrant over Israel- the White Pelican (Photo: Dror Galili)



Climate change - What is at stake in Israel: Israel's birdlife seen through the lens of a photographer

..... **Thomas Krumenacker**

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Israel is probably one of the best places in the world to witness the wonder of bird migration. Located at a migration bottleneck of global importance, the small country on its entire north-south extension is part of the Eurasian-East African flyway and the Great Rift Valley, the second most important migration route on a global scale. Thanks to its geographical situation as a land bridge between Europe, Asia and Africa, an estimated 500 million birds pass over Israel during spring and autumn migration. Among them, nearly the entire world populations of some species, such as the Lesser Spotted Eagle (*Clanga pomarina*) and the Levant Sparrowhawk (*Accipiter brevipes*), pass over Israel twice a year. Of other spectacular bird species the entire Western Palaearctic population (White Pelican *Pelecanus onocrotalus*), respectively a large part of it (White Stork *Ciconia ciconia*, Honey Buzzard *Pernis apivorus*) can be found here during migration seasons, to name just a few. Additionally despite its small size different climate and geographical zones produced an impressive variety of resident birds, from the shores of the Mediterranean to the remote Negev and Arava deserts. This exceptional situation creates outstanding opportunities for nature and wildlife photography. To Thomas' conviction nature photography should not be an end in itself but rather a powerful tool to help promote conservation, awareness, education and responsible ecological tourism - and thus become a part of the conservation effort itself. The lecture will present the awesome variety of Israel's birdlife in photographs collected during more than 30 prolonged visits to Israel over the last years and also bring up some of the problems migrating and resident birds face in a small country that develops at cyberspeed.



Common Cranes in first light, Hula Valley (Agmon) (Photo: Thomas Krumenacker)



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ADAPTATION TO CLIMATE CHANGE IN ISRAEL

The recently published fifth report of the Intergovernmental Panel on Climate Change raises the probability that most global warming is manmade to 95%. It finds that each of the past three decades has been successively warmer at the Earth's surface than in any preceding decade since 1850. It further claims that oceans have warmed, the amounts of snow and ice have diminished, sea levels have risen and concentrations of greenhouse gases have increased.

In Israel, an Israeli Climate Change Information Center (ICCIC) was set up by the Ministry of Environmental Protection in 2011 in the wake of a 2009 government decision on the preparation of a national climate change adaptation program. Established at Haifa University, in cooperation with Tel-Aviv University, the Technion and the S. Neaman Institute in the Technion, the Center is dedicated to developing the scientific knowledge base and the policy documents which will be integrated in the national plan.

Over two and a half years 2011-2013, multidisciplinary think tanks, made up of representatives from government, academia, industry and NGOs, have compiled the existing knowledge in such areas as climate, water resources, public health, biodiversity and green building and have analyzed these areas on a multidisciplinary basis using geostrategic and economic perspectives. They identified the risks and implications of climate change and the knowledge gaps in each of these areas and submitted their recommendations on prioritized research requirements, on the proposed national adaptation policy, on ways of marketing the scientific and technological knowledge collated by the ICCIC for application in Israel and around the world and, most recently, on the implementation of adaptation measures in local authorities. A comprehensive work that captures the overall governmental strategy for climate change adaptation is now under preparation.

Regarding the Predicted Climate Changes in Israel

The northern part of Israel is characterized by a Mediterranean climate and its south by an arid climate, with a narrow, semi-arid strip in between. Frequent weather changes are common in this climate zone due to the effects of climate systems with different synoptic characteristics. This is reflected by variations in both temperature and rainfall.

Global climate forecasts predict an average warming of 0.3°C-0.5°C per decade, a reduction in rainfall and an increase in the frequency and strength of extreme weather events such as heat waves and floods in the Mediterranean region over the next fifty years. In practice, the past four decades have demonstrated an average increase of 0.5°C in temperature per decade in the Mediterranean Sea area.

Furthermore, a trend of rising seawater levels, totaling more than 10 cm, was recorded in the Mediterranean Sea over the past two decades, consistent with scenarios which range from 1 to 10 cm per decade. Such a rise is associated with increased flooding along the coastal plain and increased intrusion of seawater to the coastal aquifer which leads to salinization. Wave storms



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with wave heights exceeding 3.5 meters have also increased along with exceptional storms with a wave height above 6 meters, which are expected to pose major risks to coastal installations and to the collapse of the coastal cliff.

These and other impacts of climate change – increased frequency of extreme weather events, reduced rainfall in most areas, drought years, floods, and heat waves – threaten to have a major effect on the water sector, agriculture, public health, biodiversity, the coastal environment and the urban environment in addition to their geostrategic effects and environmental and social impacts. The recognition that current mitigation measures will not prevent climate change calls for a variety of adaptation measures.

ICCIC Scenarios for Israel

- An increase in average annual temperatures of between 0.3-0.5°C per decade
- A reduction in the quantity of average precipitation of between 1.1%-3.7%
- An increase in the frequency and intensity of heat waves
- An increase in extreme events such as floods
- Increased probability of forest fires
- Increase in desertification in the southern part of Israel
- Increase in sea level

Regarding Biodiversity

Biodiversity is likely to be extensively affected by climate change, bringing about changes in the ecological services provided by natural ecosystems. The recommendations call for reducing the pressure on freshwater ecosystems and recognizing nature's right to water, conserving open areas and the ecological corridors between them, enforcing laws and policies which prevent adverse effects on open areas, managing invasive species and dealing with invasive disease vectors, and expanding the scientific base for preparedness through monitoring and research.



Black Storks migrating along the Rift Valley, in the background a Jordanian Village (Photo: Thomas Krumenacker)



A family of Red-footed Falcons, male, female and second year female (probably their daughter (?) based on behavior). The family picture was taken by Amir Ben-Dov and Ezra Hadad during the falcons' week stop over on autumn migration in the fields of Kibbutz Tzora, near Beit Shemesh, Israel (October 16th, 2014)

Selected Bibliography

Alpert P, Taunhauser D.S, Leshem Y., Kravitz A. and Rabinovitch-Hadar M. (2000) Migrating soaring birds align along sea-breeze fronts - first evidence from Israel, Bull. Amer. Meteor. Soc., 81, 1599-1601.

Butchart SHM et al (2010) Global biodiversity: Indicators of recent declines. Science 328:1164–1168 doi: 10.1126/science.1187512

Caminade C, Terray L. (2010). Twentieth century Sahel rainfall variability as simulated by the ARPEGE AGCM, and future changes. Climate Dynamics 35:75-94.

Chen I C, Hill J K, Ohlemuller R, Roy DB, Thomas CD (2011) Rapid range shifts of species associated with high levels of climate warming. Science 333:1024–1026 doi: 10.1126/science.1206432

Gofen M. (2014) Albedo and Air Temperature Changes in the Hula Valley (Israel) during 1946-2008. Open Journal of Modern Hydrology 4:101-111

Goodman RE, Lebuhn G, Seavy NE, Gardali T, Bluso-Dembers J (2011) Avian

body size changes and climate change: warming or increasing variability? Global Change Biology 18, 63–73

Taunhauser D.S., Leshem Y., Kravitz A. and Rabinovitch-Hadar M. (2000) Migrating soaring birds align along sea-breeze fronts - first evidence from Israel, Bull. Amer. Meteor. Soc., 81, 1599-1601.

Held IM, Delworth TL, Lu J, Findell KL, Knutson TR. (2005) Simulation of Sahel drought in the 20th and 21st centuries. PNAS 102:17891-17896

Krumenacker, T. (2012) The Sinai Rosefinch *Carpodacus synoicus* in Israel - Are desert birds also affected by climate change? Limicola 26-1 (1-20) Einbek, in german with english summary

Krumenacker, T. (2013) The migration of the Lesser Spotted Eagle *Aquila pomarina*, Honey Buzzard *Pernis apivorus*, Levant Sparrowhawk *Accipiter brevipes*, White Stork *Ciconia ciconia* and Great White Pelican *Pelecanus onocrotalus* in Northern Israel - a balance over 30 years, Limicola 26-3 (161-237), Einbek, in german with english summary



Lavergne S, Mouquet N, Thuiller W et al

(2010) Biodiversity and climate change: Integrating evolutionary and ecological responses of species and communities. *Annu Rev Ecol Evol Syst* 41:321–350 doi: 10.1146/annurev-ecolsys-102209-144628

Møller, A. P., W. Fiedler & P. Berthold

(2010) *Effects of Climate Change on Birds*. Oxford University Press

Nevo, E. (2006). "Evolution Canyon": A microcosm of life's evolution focusing on adaptation and speciation. *Israel Journal of Ecology & Evolution*, 52(3–4), 485–506

Nevo E., Fu Y.B., Pavlicek T., Khalifa S., Tavasi M., Beiles A.

(2012) Evolution of wild cereals during 28 years of global warming in Israel, *Proc Natl Acad Sci U S A*. 109(9): 3412–3415

Palmer M, Lettenmaier D, Poff N et al

(2009) Climate Change and River Ecosystems: Protection and Adaptation Options. *Environ Manage* 44:1053-1068 doi: 10.1007/s00267-009-9329-1

Pearce-Higgins, J. W. (2014) *Birds and Climate Change: Impacts and Conservation Responses*. University of Cambridge

Samuels R, Rimmer A, Alpert P

(2009) Effect of extreme rainfall events on the water resources of the Jordan River. *J Hydrol* 375:513-523 doi:10.1016/j.jhydrol.2009.07.001



Houbara Bustard almost extinct in the Middle East. In Israel about 250 birds can still be seen in the Negev deserts (Photo: Thomas Krumenacker)

Sternberg, M., Gabay, O., Angel, D., Barneah, O., Gafny, S., Gasith, A., Grünzweig, J.M., Hershkovitz, Y., Israel, A., Milstein, D., Rilov, G., Steinberger, Y., Zohary, T.

(2014) Impacts of climate change on biodiversity in Israel – an expert assessment approach. *Regional Environmental Change* DOI 10.1007/s10113-014-0675-z

Wormworth, J. & C. H. Sekercioglu (2011) *Winged Sentinels: Birds and Climate Change*. Cambridge University Press

Yom-Tov Y, Geffen E (2010) Recent spatial and temporal changes in body size of terrestrial vertebrates: probable causes and pitfalls. *Biological Review* 86, 531-541

Ziv B, Saaroni H, Pargament R, Harpaz T, Alpert P

(2014) Trends in rainfall regime over Israel, 1975–2010, and their relationship to large-scale variability. *Reg Environ Change* doi: 10.1007/s10113-013-0414-x (in press)

Zwarts, L, P. van Beukering, B. Kone & Wymenga E

(2005) The Niger, a lifeline. *Lelystad: Rijkswaterstaat/IVM/Wetlands International/A&W*. p. 1-304. http://www.altwym.nl/uploads/file/361_1289481552.pdf

Zwarts, L, Bijlsma RJ, van der Kamp J, Wymenga, E

(2009) Living on the Edge. *Wetlands and birds in a changing Sahel*. KNNV Publishing, Zeist. p. 1-564. Summary:<http://www.altwym.nl/uploads/file/267Living%20on%20the%20Edge%20ENG.pdf>



A bachelor of the Magnificent Frigate Bird in Seymour Island, Galapagos - The cold and warm ocean streams play a key role in the avifauna (Photo: Daphna Levinson)

"הנושא החם" בשמירת הטבע בעולם:

שינויי האקלים והשפעתם על ציפורים ונדידה

מיטב המומחים מישראל ומהעולם

יום העיון יתקיים ביום שני, ט' בכסלו תשע"ה, 1 דצמבר, 2014,
באודיטוריום "בני ציון" בבית התפוצות, באוניברסיטת תל אביב

ההרצאות בשפה האנגלית, עם תרגום סימולטני מלא

התכנית

08:00-08:30 התכנסות וכיבוד קל

08:30-09:00 ברכות

מנחים: פרופ' יוסי לשם, **Gabriele Hermani**
נספחת מדעית שגרירות גרמניה בישראל
סרטון בן 6 דקות בנושא יום העיון - אייל וטל ברטוב
מר דוד לפלר, מנכ"ל המשרד להגנת הסביבה
פרופ' יוסף קלפטר, נשיא אוניברסיטת תל אביב
H.E. Andreas Michaelis, שגריר גרמניה בישראל
אישיות ירדנית בכירה - שינוי אקלים סביבה ושלום

מושב ראשון יו"ר, **Thomas Krumenacker**

09:00-09:40 **Prof. Franz Bairlein**, מנהל מכון המחקר
הלגולנד, גרמניה - עופות נודדים בעקבות
שינויי אקלים

09:40-10:05 **פרופ' פנחס אלפרט**, אוניברסיטת תל אביב -
שינויי אקלים גלובליים והשפעה פוטנציאלית על
נדידת ציפורים

10:05-10:30 **Dr. Leo Zwartz**, הולנד - חיים על הקצה:
בתי גידול לחים וציפורים בסאהל
המשתנה, אפריקה

10:30-10:55 הפסקת קפה

מושב שני

יו"ר, **ד"ר סיניה נתניהו**, מדענית ראשית,
המשרד להגנת הסביבה

10:55-11:20 **Scott Weidensaul, Steve Kress**, ארה"ב -
השפעת שינויי אקלים על אוקיננוסים
ואוכלוסיות ציפורים

11:20-11:45 **פרופ' מרסלו שטרנברג**, אוניברסיטת תל אביב -
השפעות שינויי האקלים על המגוון הביולוגי
בישראל - ידוע ובלתי ידוע בזמנים של אי-ודאות

11:45-12:05 **פרופ' יורם יום טוב**, אוניברסיטת תל אביב -
השפעת התחממות גלובלית על גודל הגוף
בציפורים וביונקים

12:05-12:40 **פאנל** - דיון עם שאלות מהציבור, מנחים:
פרופ' אוריאל ספריאל, האוניברסיטה העברית
ד"ר סיניה נתניהו

סטודיו בילט



Daphne Major Island, Galapagos and one of 13 Darwin endemic Finches. From the famous long years of studies of Peter and Rosemary Grant, the El-Ninyo played a key part in their evolution (Photos: Yossi Leshem)

הציבור מוזמן, הכניסה חופשית!

יש להירשם מראש - במייל בלבד: yleshem@post.tau.ac.il

סדנה משותפת גרמניה - ישראל:
שינויי אקלים
והשפעתם על ציפורים
ונדידת ציפורים

ח' - י' כסלו תשע"ה, 30 נובמבר - 2 דצמבר 2014
 בית התפוצות, אוניברסיטת תל אביב ועמק החולה

אפריקה
 (Drawing: Tuvia Kurtz)



חסידות לבנות בניידה
 (Photo: Thomas Krumenacker)



לבן חזה צולל לטרפון
 (Photo: Dubi Kalai)



צפון ודרום אמריקה