Biodiversity Research and Higher Education at the Research Universities of Israel – an update

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הוגש לוועדת הסביבה של המועצה הלאומית למחקר ופיתוח אזרחי

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Abstract

This is an update of a previous report, written in 2010, that found that the number of biodiversity researchers in the Israeli research universities was in steep decline. I studied the number of biodiversity researchers active in 2022 from several angles, to understand whether the situation has been remedied – given the growth of the research universities in Israel over this period. I found that despite this growth, and the growing recent understanding of the importance of the biodiversity crises we are facing, the number of biodiversity researchers in those universities has declined slightly. This implies a sharp declined relative to the size of the Israeli university system. This trend is alarming, and puzzling, given the dramatic increase in public and decision-maker awareness of the biodiversity crisis, and considering the environmental and climatic challenges faced by the state of Israel. Israel still has rich biodiversity, and strong biodiversity research, but current trajectories suggest that – at least in certain fields of study, ecosystems, and organism groups, there may soon be too few people left to study them, teach about them, train the next generation of researchers, and provide the scientific knowledge required to conserve them.

Twelve years ago (in 2010) I contributed to preparing a dataset containing details of biodiversity researchers (tenured or tenure track senior academic staff) in the Israeli research universities.

The dataset contained demographic details, dates of hiring and retirements, academic affiliations, and fields of study of all those we identified as belonging to this group. I have curated this dataset and helped with analyses and visualizations in the report that was submitted to the Academy of Sciences and Humanities (the Academy Council approved the report as a YAHALOM document, on May 3, 2011) and published in 2012 (hereby Dayan et al. 2012).

Today, 12 years after we assembled the dataset, much has changed in the Israeli higher education system, and in biodiversity research, in the world at large, and in Israel in particular. Furthermore, the biodiversity crisis and the climate crisis are now widely recognized and accepted by the public and by decision makers as real (something we biodiversity researchers were well aware of in 2010 – and before) and is a much more prominent topic in discourse worldwide and in Israel. Therefore, I thought it high time to update the 2010 report using the same type of data and analyses, now up to date to mid-2022. In 2010 we pointed out some worrying aspects in the long-term demographics and hiring trends in the field. These findings were echoed in a report published by a Committee for the Evaluation of Biology/Life Sciences Study Programs in Israel, commissioned by Council for Higher Education (2010: https://che.org.il/wp-content/uploads/2012/04/הדוח-הכללי-5.pdf). The report surveyed the "Status of Education and Research in Ecology, Evolution, and Biodiversity in Israel's Universities" based on the data in Dayan et al. (2012), and their own independent observations in site visits and reports of the different universities. The authors found multiple causes for concern about the status and trajectory of the fields, mainly because the number of positions in it was in steep decline in Israel, despite the increasing global recognition of its importance. Therefore, one may expect to find that 1. the situation has grown worse. Alternatively, if the report had any effect, and if the fact that we are facing an unprecedented anthropogenic biodiversity crisis is indeed now better accepted in the public and by decision makers, and receives more attention and higher priority, we may see that 2. The trend was reversed, and the situation improved – and the number of researchers in the field has grown, or even 3. The number of researchers has grown by more than the 14% growth of the Israeli research university system over this period. Two alternative hypotheses would be that either: 4. The situation has remained essentially static, or 5. The trends in biodiversity science in Israel follow those for the Israeli research universities' faculty (i.e., a total increase of 14%).

Methods

I followed the same methods and criteria for inclusion or exclusion of scientists used in the former report (Dayan et al. 2012). I omitted microbial ecologists and scientists in the two Israeli research institutes whose focus is agricultural and marine research (ARO and IOLR). I included Israeli scientists who study animals and plants at the genetic, developmental, physiological, individual, population, community, and ecosystem levels. I did not survey scientists whose focus is livestock or other agricultural production, neurobiologists, and developmental biologists or geneticists whose research is not primarily driven by ecological

and evolutionarily scientific questions, and scientists who study various molecular mechanisms of laboratory model species (*Arabidopsis*, zebra fish, *Drosophila*, chickens) and those whose focus is biomedical or agronomic. However, I did include theoreticians if their chief research agendas were focused on evolutionary biology, ecology, biodiversity, or conservation even if they do not focus on any particular group of organisms. I omitted archeozoologists, archeobotanists, palaeogeneticists, palynologists, and paleoanthropologists. These cut-offs were fixed in consultation with colleagues and according to scientists' web pages and publication records. In the very few cases where the lines were fuzzy, I aimed to err by being inclusive rather than exclusive.

I omitted Kamea-funded new immigrant scientists. All these criteria are the same as in Dayan et al. (2012). I updated the dataset to include scientists hired into the research universities in Israel between 2010 and 2021 (i.e., who started working by early 2022). I did not include those already recruited but who are starting their positions only in October 2022 and later. I did include as active those scientists who are due to retire later this year. Similarly, when tallying scientists as active during particular years, I counted those retiring in that year, but not those hired in it (e.g., for 2013 I counted those retiring in October 2013 but not those hired in October 2013, the latter were counted as active only since 2014).

The Israeli higher education system, at least as far as the field of biodiversity research is concerned, is very stable in the sense that people tend to stay in the institution they were hired in. For the few scientists who moved to a different institution (Maoz Fine, Ram Reshef, Assaf Distelfeld, etc.) I used the year they were hired by their first institution and their current address. I included scientists who left Israel, left the system of their own volition, or were not tenured – tallying the year they left their institution as if it was the year they retired. I also included two scientists who did not study biodiversity in 2010 despite being active in other fields in Israeli academia (Shai Morin and Ron Milo) but who have since moved into the field.

The field

Dayan et al. (2012) note that ‘Biodiversity Conservation’ first appeared as a field of study in "Web of Science" in 2000, with 16 journals, and had 28 journals (a 75% increase) in 2008. In the 2022 version of the Journal Citations Report (from ‘Web of Science’) 65 journals were listed (vs. 28; a 232% increase). For comparison, in 2021 the field of Ecology had 174 journals (vs 124 in 2008: a 40% increase). I view journal *impact factors* as measures of overall interest in the scientific field as a whole (and nothing else), thus primarily reflecting the number of scientists active in the field. Thus, it may be interesting to note that the mean impact factor of the 5 top ranking journals in biodiversity in 2021 was 9.6. In Ecology the corresponding figure is 16.2.

The mean impact factors of four of the five journals with the highest impact factors in biodiversity conservation increased by 94% between the 2010 and 2022 (latest) version of the journal citation reports (the fifth, People and Nature, obtained its first impact factor in 2022)**.** During the same period in the field of ‘Ecology’ the increase (again of 4 of the 5 journals with the highest factors; *Nature Ecology and Evolution* did not have an impact factor in

2010) increased by 56% (Table 1). These figures suggest a significant increase in number of researchers studying these fields worldwide during this period.

	2010 IF	2021 IF	Change
Ecology			
Trends in Ecology and Evolution	14.4	20.6	143%
Nature Ecology and Evolution	NA	19.1	NA
Annual Review of Ecology Evolution and Systematics	10.7	14.3	134%
Frontiers in Ecology and the Environment	8.8	13.8	156%
Global Change Biology	6.9	13.2	193%
Biodiversity conservation			
Global Change Biology	6.9	13.2	193%
Conservation Letters	4.7	10.1	214%
Conservation Biology	4.9	7.6	155%
People and Nature	NA	7.5	NA
Biological Conservation	3.5	7.5	214%

Table 1. highest impact-factor (=IF) journals in Ecology (top) and Biodiversity Conservation (bottom) in 2021 (left) and 2010 (right).

The Survey Results

The dataset that contains the details of all active and retired biodiversity researchers in Israel is presented in Appendix 1. Perhaps the most important, and most worrying, result of the current survey is that while the number of active researchers declined to 87 by 2010, it has declined slightly further – to a mere 85 in 2022 (Figure 1a). This is a particularly shocking statistic given the growth in the Israeli population over this time (~22%), in the size of the research universities (~14%), and the threats facing Israeli nature (e.g., Swiss Re Institute, 2020. Biodiversity and Ecosystem Services A business case for re/insurance, In Swiss Re Management Ltd. Zurich, Switzerland. See https://www.swissre.com/media/news-releases/nr-20200923-biodiversity-and-ecosystems-services.html; בן משה ורנן 2022, עורכים. דו"ח מצב הטבע 2022. המארג, מוזיאון הטבע ע"ש שטיינהרדט, אוניברסיטת ת"א).

The trend of an overall decrease in the number of academic faculty members (since 1990, the starting date in Dayan et al. 2012) is relatively well represented by a linear regression ($R^2 = 0.406$), is highly significant ($p < 0.001$), and represents a long term (33 years) loss of an academic position every 3 years on average (slope = -0.360). Logarithmic and power regressions do not significantly improve model fit ($R^2 < 0.41$), while a quadratic term, signifying accelerating decrease from a peak in the mid-1990s, explains 43% of the variation. Thus, if anything the linear trend is slightly too optimistic.

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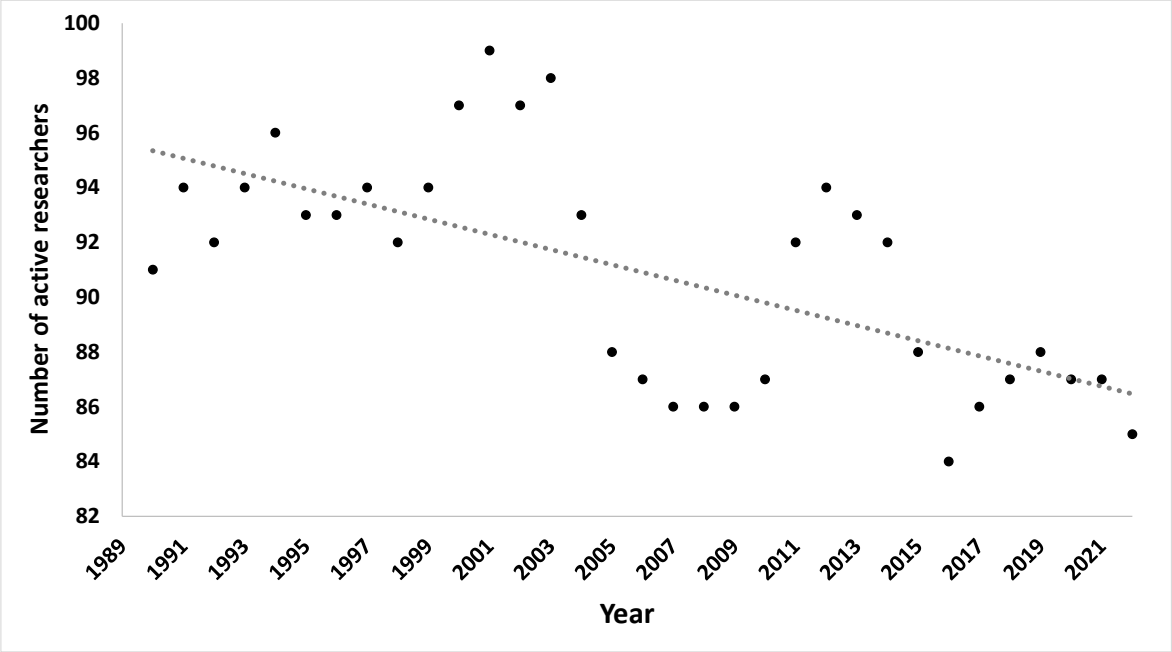

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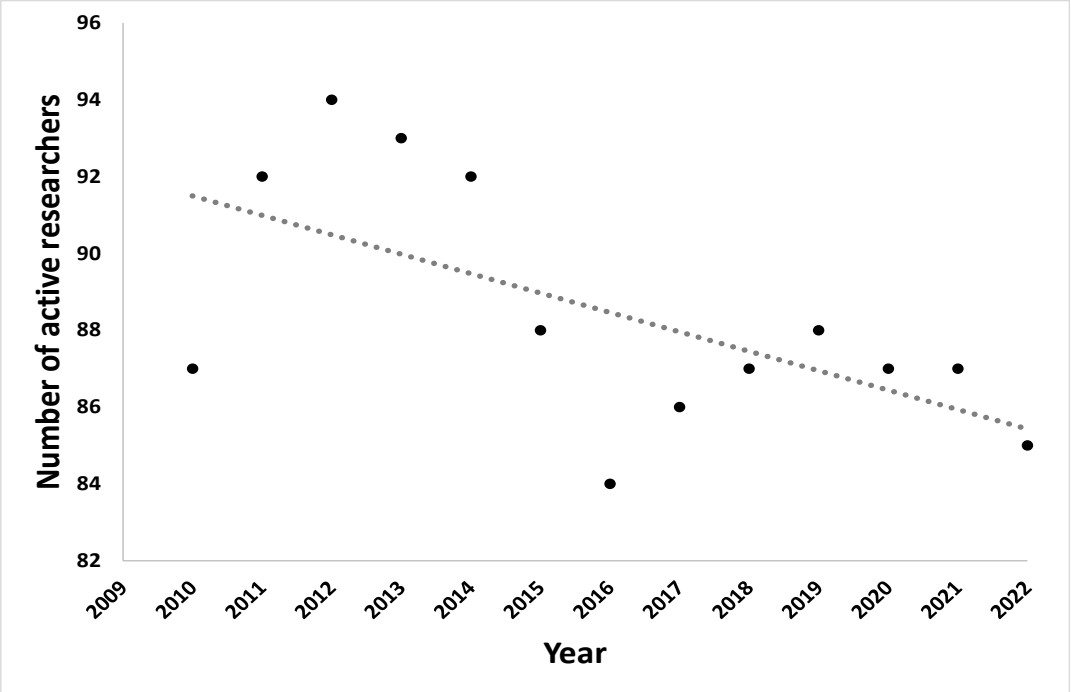

Figure 1 – the number of biodiversity tenure track senior faculty members in Israeli research universities since 1990. Data from 1990-2010 are from Dayan et al. 2012, data from 2011 to 2022 are from this work (Appendix 1). A – all years (1990-2022). B – only the years since 2010 (i.e., from when Dayan et al. 2012 finished collecting data; slope -0.51). Regression lines are linear regressions for the two datasets separately.

Nearly half (40 of 85) of the (non-emeritus) active scientists today were not yet active 12 years ago (Dayan et al. 2012). On the other hand, 42 scientists active in 2010 have retired or otherwise left the Israeli higher education system since. In terms of gender balance, despite 3 more women in the field in Israel today than in 2010, there is still a long way to go towards anything resembling gender equality (18.8% female today, 16 of 85, vs. 14.9% in 2010).

Distribution among Israeli universities

Four universities: Ben Gurion University of the Negev (BGU; between 16-20 active researchers in any given year since 2012; today: 16), the Hebrew University of Jerusalem (HUJ; between 15-19 active researchers in any given year since 2012; today: 18), Tel Aviv University (TAU; between 26-30 active researchers in any given year since 2012; today: 27), and the University of Haifa (UH; between 17-21 active researchers in any given year since 2012; today: 17), have the bulk of researchers. The Technion (TI; 2-3 researchers), Weizmann Institute of Science (WI; 1-3) and Bar Ilan University (BIU; 2-3) have far fewer (Figure 2).

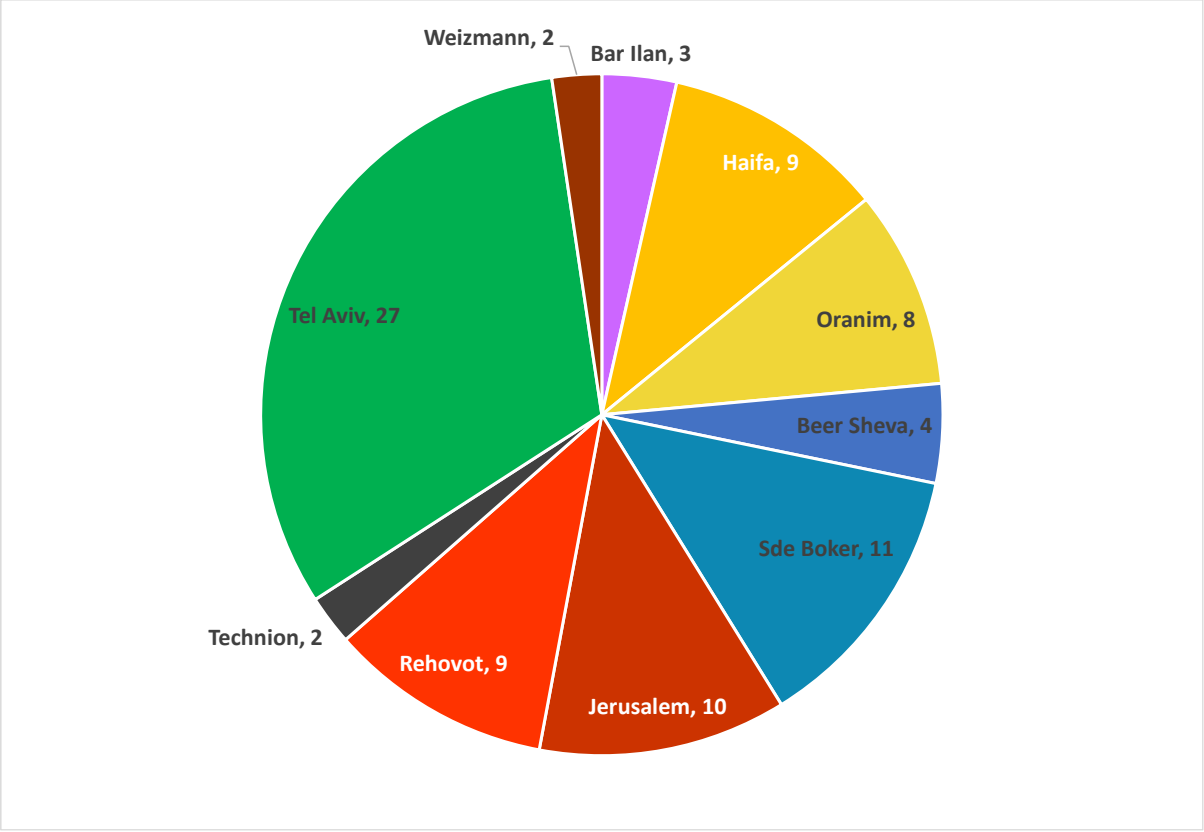

Figure 2. The Number of active tenure track faculty members in 2022, per university campus. Colours are arbitrary, but different campuses belonging to the same university (Sde Boker and Beer Sheva: BGU; Rehovot and Jerusalem: HUJ; Haifa and Oranim: UH) are grouped by similar colours and placed next to each other. Researchers in the Inter-University Institute for Marine Science in Eilat (4, from 3 universities) were counted in the main campuses of their respective universities.

The changes in trajectory differ across institutions. The Hebrew University has seen its first increase in the number of faculty members over the last 5-year period (one of them transferred from BIU so is not a net increase in the field in Israel), after 25 years of net deficit (Figure 3). Faculty numbers in Ben Gurion University and the University of Haifa increased for 20 and 15 years, respectively, but both show declines in the last 10 years, and these declines are especially steep for the last 5 years (Figure 3). The institution with most biodiversity researchers, Tel Aviv University, shows no clear temporal pattern in the past decade but has not recovered from the decimation it suffered between 1998 and 2007 when it lost 14 people in total, nearly the number employed by the next largest institution (Figure 3).

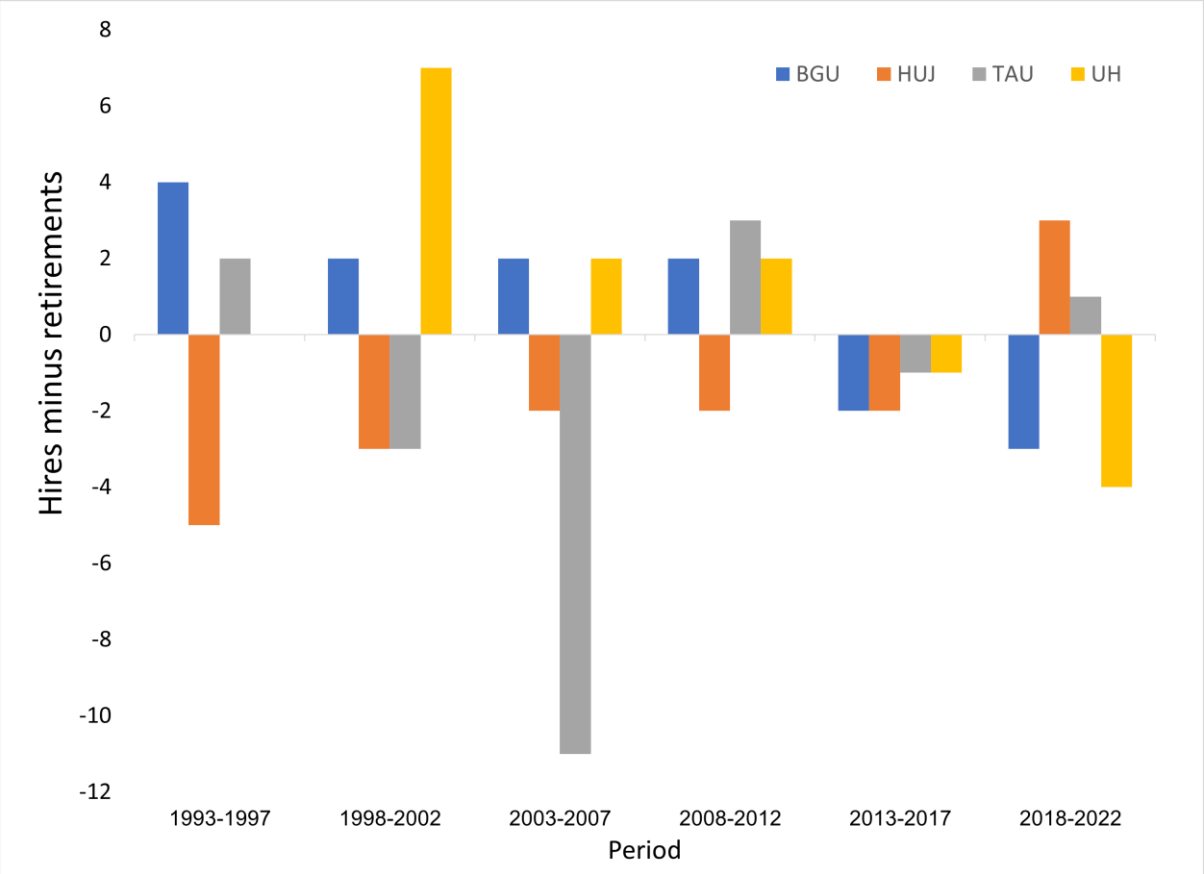

Figure 3. Hires and retirements (including faculty members who moved to institutions abroad and/or were not tenured and left) in the four institutions with the most biodiversity researchers in Israel. Data are grouped into 5-year periods.

Education of current faculty

The 85 active biodiversity researchers in Israeli research universities were predominantly educated (i.e., received their PhDs) in either Tel Aviv University (29) or the Hebrew University (21), with a sizeable number also graduating from Ben Gurion University (13) and from various institutions abroad (14). Other universities (Bar Ilan: 1; the Technion: 2,

Weizmann Institute: 4, and the University of Haifa: 1) had much lower contributions. Eighty-three percent of active researchers were educated in Israel. If we count the number of researchers hired per 4-year period, by the institution in which they carried out their PhD, the only clear pattern that emerges is a lower overall number of hires in the last 8 years (Figure 4a), with perhaps a proportional decrease in HUJ graduates and an increase in TAU graduates overall (Figure 4b). Overall, in the system more people were educated at the Weizmann Institute (high ratio but few people), the Hebrew University, and Tel Aviv University, than expected given the size (i.e., number of researchers) of each institution and the total number of those obtaining their PhD in Israel. Ben Gurion University produced very close to the number expected, while many fewer were educated at the University of Haifa relative to expectation.

All institutions who hired researchers between 2010 and 2022 hired more of their own graduates than expected given the number of their own graduates relative to the numbers hired (i.e., the expectation is the number of hires per institution times the number of those in the higher education system doing their PhD there, divided by 85: the number of people in the system). This is especially clear for Ben Gurion University (4.4 own hires for every 1 expected) and less so for Tel Aviv University (1.6/1) and the Hebrew University (1.3/1). I did not attempt to calculate probabilities or estimate significance for these numbers. The only University of Haifa graduate was hired by the University of Haifa, but numbers are too small to make a statement based on this fact.

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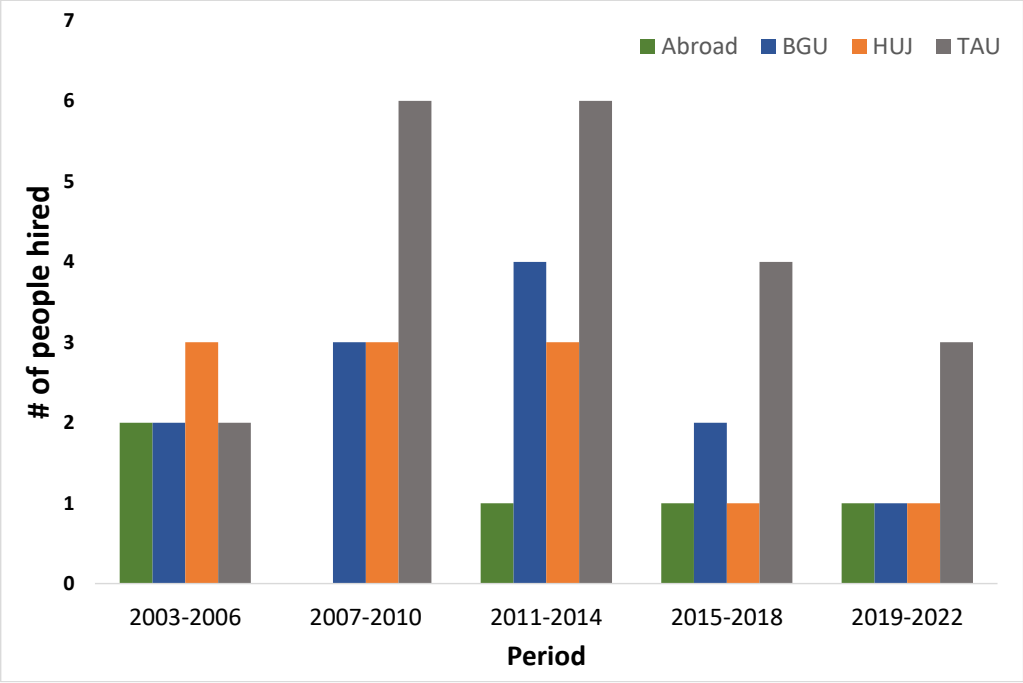

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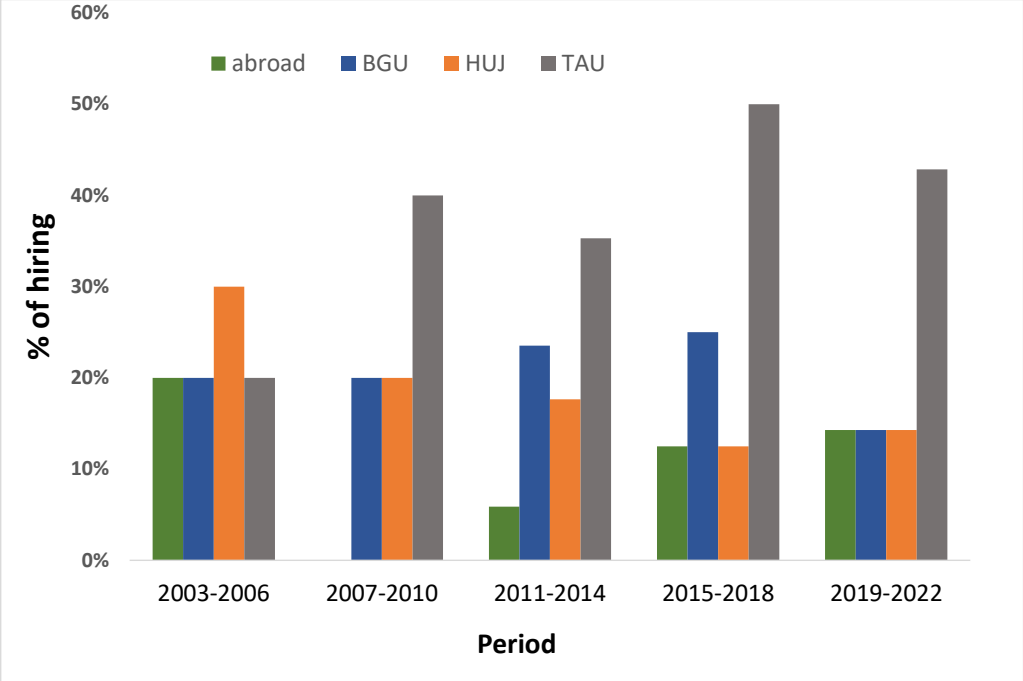


Figure 4: people hired into the Israeli higher education system per 4-year period, according to the institution where they received their PhD. Only those still in the system (i.e., those who have not left e.g., because they were not tenured) are included. A: number of people. B: percentage out of all those hired per 4-year period (percentages are < 100% because the contributions of WI, BIU, TI and UH are not shown).

Thus, all institutions prefer to hire their own graduates. Levels of 'inbreeding' – already alluded to in the 2010 report presented to the council of Higher Education (https://che.org.il/wp-content/uploads/2012/04/הדוח-הכללי-5.pdf; section 3.4) are still high. Furthermore, it seems that we do not tend to 'shop' much abroad (or accept foreign candidates) for our staff.

Fields and environment of study

In terms of research environments, the numbers and percentages of scientists working in terrestrial and marine ecosystems remained relatively constant since 2010 (Figure 5). Two major differences, in minor environments, are on the one hand the addition of three theoreticians whose research cannot be readily associated with a particular environment, and the decline (from 7 to 4) of freshwater (aquatic) biologists (Figure 5). I acknowledge, however, that deciding what category to assign a scientist to is – for many, somewhat arbitrary, and potentially controversial.

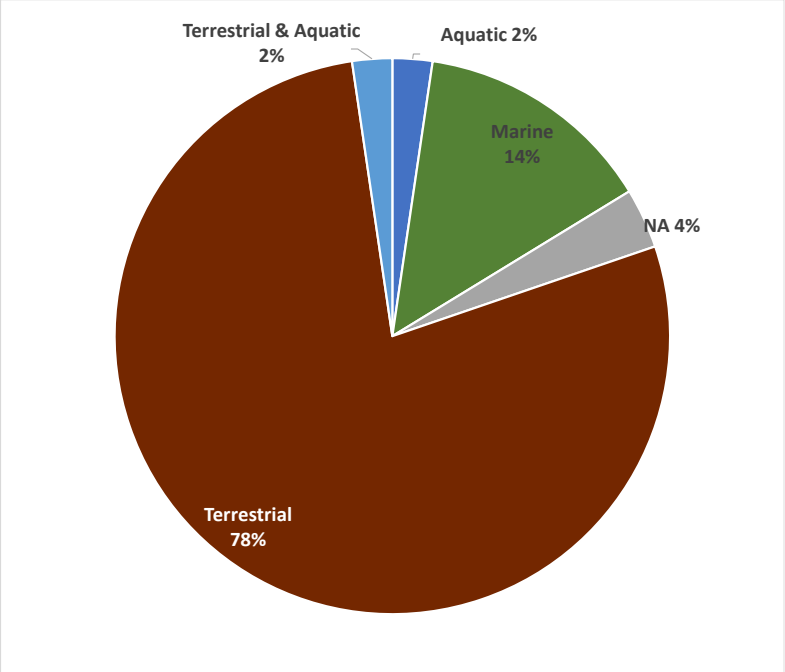


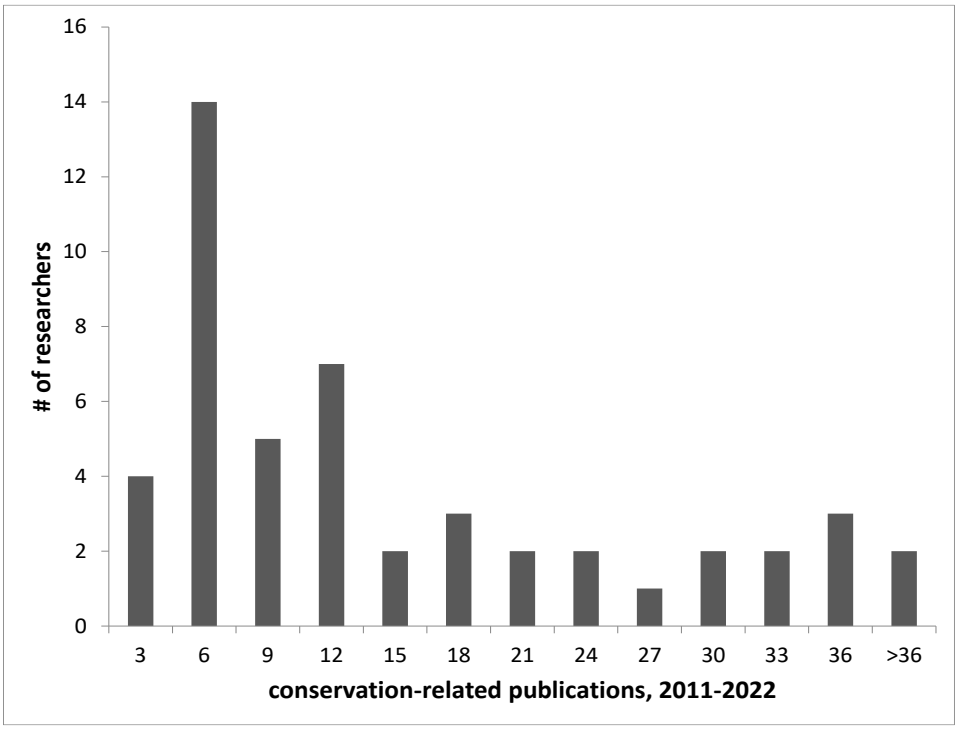
Figure 5. The percentage of researchers working in different environments; the corresponding numbers are Terrestrial: 67, Terrestrial and Aquatic: 2, Aquatic: 2, Marine: 12, NA (theoreticians): 3.

We have also estimated the number of researchers at both time periods engaging in three types of research at least as a part of their research programme: taxonomy, physiology, and conservation. We took a liberal approach to assign scientists to field – and examined their Google Scholar publication record (for the relevant 12-year period) to see if they publish in discipline-related journals or publish discipline-related papers, tallying a scientist as active in a field if she/he had more than one paper with a leading role (first or last author) over the relevant period. Publications exclude conference proceedings, preprints, corrigenda etc., but otherwise criteria were liberal: a study of an invasive species as a model system for general biological phenomena, for example, was tallied as a conservation-related study.

Conservation biology has seen a minor decrease (from 50 to 49 researchers, when we use inclusive criteria [at least one paper in conservation biology between 2011 and 2022, for the researchers active in 2022 – and if in doubt we tended to treat papers as if they are conservation-related]), well within the margin of error, and note we did not attempt to count 2000-2010 papers for the scientists who were active in 2010 but have since retired). The field is also relatively large (i.e., most of the biodiversity researchers in Israeli research universities are listed as practicing conservation at least in some capacity) and unlikely to undergo major declines due to stochastic events as do smaller fields (here physiology and, especially, taxonomy – see below). According to their Google Scholar accounts, and their paper titles, these 49 researchers published one (3 people), two (1 person), and 4-40 conservation-related papers during the last 12 years (2011-2022), comprising 2-93% of their publication output (mean 28%; Figure 6). Most (26 of 49) published such a paper, on average, every 1-3 years. Thus, while many scientists are active in the field in some capacity, it is only very few for

whom conservation biology is a major aspect of their scientific work (Figure 6b), or who would describe themselves first and foremost as conservation biologists.

A.



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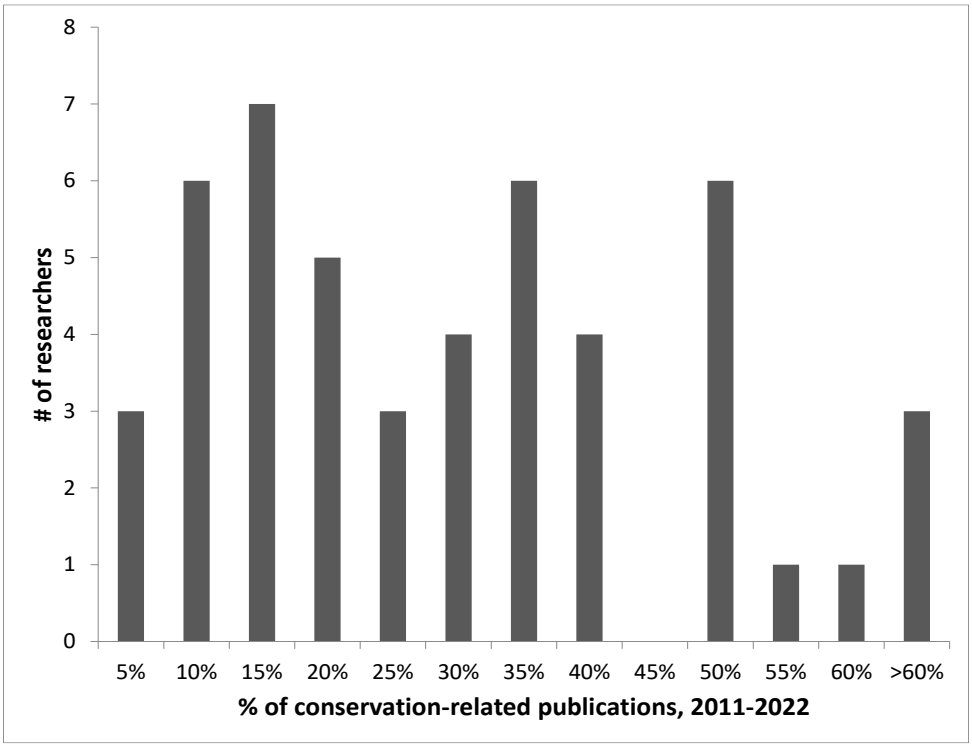

Figure 6. Histogram of the number (A) and percentage (B) of publications listed in scientists' Google Scholar account, for conservation-related papers between 2011 and 2022.

The number of researchers studying **taxonomy** has declined by two; while this is not a numerically large decline, the field was tiny to begin with. Thus, nowadays eight scientists study taxonomy, compared to ten in 2010 – a 20% drop.

A large decrease was listed in the field of **physiological ecology,** which declined from 26 to 20 scientists between 2010 (Dayan et al. 2012) and today (23% decrease; data in Appendix 1).

Conclusions

Despite the growth of the Israeli population and of the threats facing its biological diversity, despite the fact that the dire state of biodiversity research in Israel has been known for over a decade (Dayan et al. 2012), and despite the growth of the research universities in Israel over the last 12 years, the volume of biodiversity research in those universities has remained the same – or declined slightly (in terms of numbers of researchers). The number of researchers in two major institutions in which biodiversity was studied 20 years ago (the Hebrew University and Tel Aviv University) has declined and failed to recover fully (Figure 3). The numbers of relevant scientists in the other two institutions with many biodiversity researchers, Ben Gurion University (especially in the main, Beer-Sheva campus; Figure 2) and the University of Haifa, have declined over the last decade (Figure 3). While conservation biology as a field is still strong in Israel, it is not growing. Other important fields, i.e., both taxonomy and physiological ecology, are in decline, as is the study of freshwater ecosystems. It may be that some growth has occurred in colleges – which are outside the scope of this work. However, most of the research in Israel is conducted in the research universities where most of the higher education funds are invested. Relatively little research is conducted in colleges, and they cannot train PhD level students and thus cannot educate the next generation of biodiversity researchers in Israel.

Israel still has rich biodiversity, and strong biodiversity research, but current trajectories suggest that – at least in certain fields of study, ecosystems and taxa, there may soon be few people left to study them, teach about them, and fight for them. The dramatic increase in public and decision-maker awareness of the biodiversity crisis seems, from the perspective covered in this report, to have completely skipped the Israeli university system, which much lower than it has been 20 years ago, and if anything, since the publication of previous reports 10-12 years ago, has slightly declined in absolute terms, and sharply declined relative to the size of the Israeli university system, the size of the Israeli population, and the perceived importance of the field.

Acknowledgements

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Appendix 1 – the dataset

A. Scientists active in 2022 (i.e., Lecturers, senior lecturers, associate professors or professors, not emeriti, and in the Israeli university system) alphabetical order, given names first)

B. Scientists active in 2010 who since retired or left the Israeli system

A.

Name	Active 2022	Active 2010	Institution	Campus	Gender	Recruitment year	Retirement Year	Alma Mater	Medium	Conservation	Taxonomy	Physiology
Adam Lampert	yes	no	HUJ	Rehovot	Male	2021	2050	WI	NA	yes	no	no
Alon Silberbush	yes	no	UH	Oranim	Male	2016	2041	BGU	Aquatic	no	no	no
Amir Ayali	yes	yes	TAU	Tel Aviv	Male	1999	2031	HUJ	Terrestrial	no	no	yes
Amiyaal Ilany	yes	no	BIU	Bar Ilan	Male	2016	2042	TAU	Terrestrial	no	no	no
Amos Bouskila	yes	yes	BGU	Beer Sheva	Male	1994	2023	Abroad	Terrestrial	yes	no	no
Ariel Chipman	yes	yes	HUJ	Jerusalem	Male	2007	2036	HUJ	Terrestrial	no	no	no
Ariel Novoplansky	yes	yes	BGU	Sde Boker	Male	1993	2027	HUJ	Terrestrial	no	no	no
Arnon Lotem	yes	yes	TAU	Tel Aviv	Male	1994	2030	TAU	Terrestrial	no	no	no
Assaf Distelfeld	yes	no	UH	Haifa	Male	2011	?	UH	Terrestrial	no	no	no
Assaf Shwartz	yes	no	TI	Technion	Male	2014	2045	Abroad	Terrestrial	yes	no	no
Avi Bar-Massada	yes	no	UH	Oranim	Male	2012	2044	TI	Terrestrial	yes	no	no
Avigdor Abelson	yes	yes	TAU	Tel Aviv	Male	1995	2027	TAU	Marine	yes	no	no
Berger-Tal Oded	yes	no	BGU	Sde Boker	Male	2016	2044	BGU	Terrestrial	yes	no	no
Boaz Yuval	yes	yes	HUJ	Rehovot	Male	1989	2023	HUJ	Terrestrial	no	no	yes
Boris Krasnov	yes	no	BGU	Sde Boker	Male	2011?	2023	Abroad	Terrestrial	no	no	yes
Burt Kotler	yes	yes	BGU	Sde Boker	Male	1985	2022	Abroad	Terrestrial	no	no	no
Dan Malkinson	yes	yes	UH	Haifa	Male	2006	2034	BGU	Terrestrial	yes	no	no
Dan Tchernov	yes	yes	UH	Haifa	Male	2004	2035	HUJ	Marine	yes	no	no
David Saltz	yes	yes	BGU	Sde Boker	Male	1997	2022	Abroad	Terrestrial	yes	no	no
Dorothee Huchon	yes	yes	TAU	Tel Aviv	Female	2003	2042	Abroad	Marine	no	yes	no
Dror Hawlena	yes	no	HUJ	Jerusalem	Male	2012	?	BGU	Terrestrial	no	no	yes
Edwin Lebrija	yes	no	UH	Oranim	Male	2016	2043	Abroad	Terrestrial	yes	no	no
Elad Chiel	yes	no	UH	Oranim	Male	2012	2037	HUJ	Terrestrial	yes	no	no

Name	Active 2022	Active 2010	Institution	Campus	Gender	Recruitment year	Retirement Year	Alma Mater	Medium	Conservation	Taxonomy	Physiology
Eli Geffen	yes	yes	TAU	Tel Aviv	Male	1994	2026	Abroad	Terrestrial, Aquatic	yes	no	no
Eran Gefen	yes	yes	UH	Oranim	Male	2008	2037	TAU	Terrestrial	no	yes	yes
Eran Levin	yes	no	TAU	Tel Aviv	Male	2017	2042	TAU	Terrestrial	no	no	yes
Eyal Privman	yes	no	UH	Haifa	Male	2013	?	TAU	Terrestrial	no	no	no
Frida Ben-Ami	yes	yes	TAU	Tel Aviv	Female	2010	2035	HUJ	Aquatic	yes	no	no
Gal Ribak	yes	no	TAU	Tel Aviv	Male	2013	2040	TI	Terrestrial	no	no	no
Gila Kahila Bar-Gal	yes	yes	HUJ	Rehovot	Female	2005	2030	HUJ	Terrestrial	yes	yes	no
Gili Greenbaum	yes	no	HUJ	Jerusalem	Male	2021	?	BGU	Terrestrial	yes	no	no
Guy Bloch	yes	yes	HUJ	Jerusalem	Male	2001	2030	TAU	Terrestrial	no	no	yes
Guy Sella	yes	yes	HUJ	Jerusalem	Male	2005	2038	TAU	NA	no	no	no
Hadas Hawlena	yes	wasn't counted	BGU	Sde Boker	Female	2010	2043	BGU	Terrestrial	no	no	no
Ido Izhaki	yes	yes	UH	Haifa	Male	1990	2022	HUJ	Terrestrial	yes	no	yes
Inon Scharf	yes	no	TAU	Tel Aviv	Male	2012	2048	BGU	Terrestrial	no	no	no
Itamar Giladi	yes	no	BGU	Sde Boker	Male	2013	2035	BGU	Terrestrial	yes	no	no
Itay Mayrose	yes	no	TAU	Tel Aviv	Male	2011	?	TAU	Terrestrial	no	no	no
Jose Gruenzweig	yes	yes	HUJ	Rehovot	Male	2004	2031	WI	Terrestrial	yes	no	yes
Lee Koren	yes	no	BIU	Bar Ilan	Female	2012	?	TAU	Terrestrial	no	no	yes
Lilach Hadany	yes	yes	TAU	Tel Aviv	Female	2008	2041	TAU	Terrestrial	no	no	no
Maoz Fine	yes	yes	HUJ	IUI	Male	2006	2037	TAU	Marine	yes	no	no
Marcelo Sternberg	yes	yes	TAU	Tel Aviv	Male	1999	2033	HUJ	Terrestrial	yes	no	no
Merav Seifan	yes	no	BGU	Sde Boker	Female	2013	2042	HUJ	Terrestrial	yes	no	no
Micha Ilan	yes	yes	TAU	Tel Aviv	Male	1991	2025	TAU	Marine	yes	yes	yes
Michal Gruntman	yes	no	TAU	Tel Aviv	Female	2019	?	Abroad	Terrestrial	yes	no	yes
Michal Segoli	yes	wasn't counted	BGU	Sde Boker	Female	2010	2044	BGU	Terrestrial	no	no	no
Moshe Coll	yes	yes	HUJ	Rehovot	Male	1997	2025	Abroad	Terrestrial	no	no	no
Moshe Inbar	yes	yes	UH	Haifa	Male	2000	2029	TAU	Terrestrial	yes	no	yes
Moshe Kiflawi	yes	yes	BGU	IUI	Male	2003	2029	Abroad	Marine	yes	no	yes
Nadav Shashar	yes	yes	BGU	IUI	Male	1999	2030	Abroad	Marine	yes	no	yes
Netta Dorchin	yes	no	TAU	Tel Aviv	Female	2011	2043	TAU	Terrestrial	yes	yes	no
Nir Sapir	yes	no	UH	Haifa	Male	2014	2041	HUJ	Terrestrial	no	no	yes
Niv De-malach	yes	no	HUJ	Rehovot	Male	2020	2052	HUJ	Terrestrial	yes	no	no
Noa Shenkar	yes	no	TAU	Tel Aviv	Female	2012	2045	TAU	Marine	yes	yes	no
Noga Kronfeld-Schor	yes	yes	TAU	Tel Aviv	Female	2001	2032	TAU	Terrestrial	yes	no	yes

Name	Active 2022	Active 2010	Institution	Campus	Gender	Recruitment year	Retirement Year	Alma Mater	Medium	Conservation	Taxonomy	Physiology
Ofer Ovadia	yes	yes	BGU	Beer Sheva	Male	2004	2031	BGU	Terrestrial	yes	no	no
Ofir Levy	yes	no	TAU	Tel Aviv	Male	2017	2045	TAU	Terrestrial	no	no	yes
Omri Bronstein	yes	no	TAU	Tel Aviv	Male	2019	2044	TAU	Marine	yes	yes	no
Oren Kolodny	yes	no	HUJ	Jerusalem	Male	2019	2048	TAU	Terrestrial	no	no	no
Oren Levi	yes	yes	BIU	Bar Ilan	Male	2008	2037	BIU	Marine	yes	no	yes
Orr Spiegel	yes	no	TAU	Tel Aviv	Male	2018	2044	HUJ	Terrestrial	yes	no	no
Rami Reshef	yes	yes	UH	Haifa	Male	2010	2028	TAU	Terrestrial	no	no	no
Ran Nathan	yes	yes	HUJ	Jerusalem	Male	2001	2030	HUJ	Terrestrial	yes	no	no
Roi Holzman	yes	wasn't counted	TAU	IUI	Male	2010	2040	HUJ	Marine	no	no	no
Ron Milo	yes	wasn't counted	WI	Weizmann	Male	2008	2043	WI	Terrestrial	yes	no	no
Ronen Kadmon	yes	yes	HUJ	Jerusalem	Male	1993	2024	HUJ	Terrestrial	yes	no	no
Shai Markman	yes	yes	UH	Oranim	Male	2008	2031	BGU	Terrestrial	no	no	no
Shai Meiri	yes	yes	TAU	Tel Aviv	Male	2009	2042	TAU	Terrestrial	yes	yes	no
Shai Morin	yes	wasn't counted	HUJ	Rehovot	Male	2003	2033	HUJ	Terrestrial	no	no	no
Sharoni Shafir	yes	yes	HUJ	Rehovot	Male	1998	2031	Abroad	Terrestrial	no	no	no
Shirli Bar-David	yes	yes	BGU	Sde Boker	Female	2007	2036	TAU	Terrestrial	yes	no	no
Tamar Dayan	yes	yes	TAU	Tel Aviv	Female	1991	2025	TAU	Terrestrial	yes	no	no
Tamar Keasar	yes	yes	UH	Oranim	Female	2001	2033	HUJ	Terrestrial	yes	no	no
Tamir Klein	yes	no	WI	Weizmann	Male	2016	2050	WI	Terrestrial	yes	no	yes
Tzion Fahima	yes	yes	UH	Haifa	Male	1999	2027	BGU	Terrestrial	no	no	no
Uri Roll	yes	no	BGU	Sde Boker	Male	2018	2043	TAU	Terrestrial, Aquatic	yes	no	no
Uri Shanas	yes	yes	UH	Oranim	Male	2002	2029	TAU	Terrestrial	yes	no	no
Yael Mandelik	yes	yes	HUJ	Rehovot	Female	2007	2040	TAU	Terrestrial	yes	no	no
Yaron Ziv	yes	yes	BGU	Beer Sheva	Male	1998	2028	Abroad	Terrestrial	yes	no	no
Yoav Ram	yes	no	TAU	Tel Aviv	Male	2020	2051	TAU	NA	no	no	no
Yohay Carmel	yes	yes	TI	Technion	Male	2000	2027	HUJ	Terrestrial	yes	no	no
Yoni Belmaker	yes	no	TAU	Tel Aviv	Male	2012	2044	BGU	Marine	yes	no	no
Yossi Yovel	yes	no	TAU	Tel Aviv	Male	2011	2047	TAU	Terrestrial	no	no	no
Yuval Sapir	yes	wasn't counted	TAU	Tel Aviv	Male	2009	2037	HUJ	Terrestrial	yes	yes	no

B. Scientists who were active (see definition above) in 2010, and since retired or otherwise left the Israeli university system

Name	Institution	Campus	Gender	Recruitment year	Retirement Year	Alma Mater	Medium		Conservation	Taxonomy	Physiology
Aaron Kaplan	HUJ	Jerusalem	Male	1977	2013		Aquatic	no	no	yes	
Abraham B. Korol	UH	Haifa	Male	1991	2014	Abroad	Terrestrial	no	no	no	
Abraham Haim	UH	Haifa	Male	early	2011		Terrestrial	no	no	yes	
Abraham Hefetz	TAU	Tel Aviv	Male	1978	2015		Terrestrial	no	yes	no	
Allan Degen	BGU	Sde Boker	Male	1997	2014	TAU	Terrestrial	no	no	yes	
Amatzia Genin	HUJ	IUI	Male	1987	2019		Marine	yes	no	no	
Aminadav Yawetz	TAU	Tel Aviv	Male	early	2012		NA	no	no	yes	
Amnon Freidberg	TAU	Tel Aviv	Male	1980	2013		Terrestrial	yes	yes	no	
Amots Dafni	UH	Haifa	Male	1977	2012		Terrestrial	yes	no	no	
Amram Eshel	TAU	Tel Aviv	Male	1980	2012		Terrestrial	yes	no	yes	
Avi Shmida	HUJ	Jerusalem	Male	1979	2014		Terrestrial	yes	no	no	
Avital Gasith	TAU	Tel Aviv	Male	early	2012	Abroad	Aquatic	yes	no	no	
Berry Pinshow	BGU	Sde Boker	Male	1977	2015		Terrestrial	no	no	yes	
Bert Boeken	BGU	Sde Boker	Male	1991	2019	BGU	Terrestrial	yes	no	no	
Dan Yakir	WI	Weizmann	Male	1991	2021	HUJ	Terrestrial	yes	no	yes	
David Eilam	TAU	Tel Aviv	Male	1989	2020	TAU	Terrestrial	no	no	no	
Ehud Spanier	UH	Haifa	Male	1975	2013		Marine	yes	no	no	
Gad Katzir	UH	Oranim	Male	1991	2016		Terrestrial	no	no	yes	
Gidi Neeman	UH	Oranim	Male	1988	2014	TAU	Terrestrial	yes	no	no	
Itzhak Choshniak	TAU	Tel Aviv	Male	1980	2013		Terrestrial	no	no	yes	
Jaime Kigel	HUJ	Rehovot	Male	early	2011		Terrestrial	yes	no	yes	
Leon Blaustein	UH	Haifa	Male	1999	2021	Abroad	Terrestrial, Aquatic	yes	no	no	
Lewi Stone	TAU	Tel Aviv	Male	1993	2018	Abroad	NA	yes	no	no	
Menachem Goren	TAU	Tel Aviv	Male	1978	2012		Marine, Aquatic	yes	yes	no	
Michael Ovadia	TAU	Tel Aviv	Male	1976	2010		Terrestrial	no	no	yes	
Pua Bar	BGU	Beer Sheva	Female	1985	2019		Terrestrial	yes	no	no	
Rachel Ben Shlomo	UH	Oranim	Female	2001	2021	UH	Terrestrial	no	no	no	

Name	Institution	Campus	Gender	Recruitment year	Retirement Year	Alma Mater	Medium		Conservation	Taxonomy	Physiology
Roni Aloni	TAU	Tel Aviv	Male	1976	2012		Terrestrial	no	no	yes	
Salit Kark	HUJ	Jerusalem	Female	2002	2013	HUJ	Terrestrial	yes	no	no	
Sergei Volis	BGU	Beer Sheva	Male	2003	2012	BGU	Terrestrial	yes	no	no	
Simcha Lev-Yadun	UH	Oranim	Male	2000	2020	TAU	Terrestrial	yes	no	yes	
Solomon P. Wasser	UH	Haifa	Male	1994	2014	Abroad	Terrestrial	no	yes	no	
Sven Beer	TAU	Tel Aviv	Male	1981	2017		Marine	yes	no	yes	
Uzi Motro	HUJ	Jerusalem	Male	early	2012	TAU	Terrestrial	yes	no	no	
Yael Lubin	BGU	Sde Boker	Female	1984	2013		Terrestrial	yes	no	no	
Yehuda Benayahu	TAU	Tel Aviv	Male	1987	2016	TAU	Marine	yes	yes	no	
Yoram Ayal	BGU	Sde Boker	Male	1986	2014		Terrestrial	no	no	no	
Yossi Leshem	TAU	Tel Aviv	Male	1998	2015	TAU	Terrestrial	yes	no	no	
Yossi Steinberger	BIU	Bar Ilan	Male	1982	2015		Terrestrial	no	no	yes	
Yossil Loya	TAU	Tel Aviv	Male	1972	2010		Marine	yes	yes	no	
Zeev Arad	TI	Technion	Male	1985	2016	HUJ	Terrestrial	no	no	yes	
Zvika Abramsky	BGU	Beer Sheva	Male	1979	2015		Terrestrial	no	no	no	