Masterarbeiten an der Schweizerischen Vogelwarte 2025/2026

https://www.vogelwarte.ch/de/wir/mitarbeit/masterarbeiten-doktorarbeiten/

Sand Martin colonization and breeding success in artificial sand fills

The aim of this Master's thesis is to investigate which factors influence colonization and breeding success of artificial sand fills both at the colony site level (such as the size and the material of the artificial sand fills) and at the landscape level (such as the land use in the colony surroundings or the distance to the next existing colony). The results will provide a basis for decisions on how to improve the site selection and design of artificial sand fills as a conservation measure for the Sand Martin.

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Winter diet of a high-elevation specialist, the White-winged Snowfinch

The Snowfinch is a climate sensitive species. Raising temperature affect the survival of females and males differently. In the Master thesis, the winter diet is identified using metabarcoding and compared between the sexes, age classes and between groups of birds differing in their social behaviour. The results will help understanding why raising temperatures may affect individuals differently. Such knowledge helps understanding the mechanisms with which global warming affects the population dynamics of a high-elevation bird species.

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How is social behaviour linked to diurnal and seasonal patterns in body mass?

The Snowfinch is a climate sensitive species. Raising temperature affect the survival of females and males differently. We further observed differences in the social behaviour between the sexes. In this Master thesis, we will observe how social behaviour correlates with body weight during winter. The results will help understanding why raising temperatures may affect individuals differently. Such knowledge helps understanding the mechanisms with which global warming affects the population dynamics of a high-elevation bird species.

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When birds take a different route: what abnormal orientation can reveal about migration

This project will investigate variations in migratory orientation at the start of birds' first journeys using decades of EURING ringing recovery data. It will identify abnormal routes, explore their underlying causes, and examine geographic or population-specific patterns to better understand the navigational mechanisms guiding young migratory birds.

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Genomic tracing of a recent colonization event in the Eurasian Blue Tit

This project will use whole-genome data to determine whether Ouessant Island's Blue Tit population originated from distant migratory birds or nearby sedentary populations. By comparing genomic sequences from island and European mainland populations, the student will investigate the sources of these pioneering individuals and the mechanisms behind rare colonization events.

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Uncovering the costs of migration strategies in red kites using accelerometer data

Using accelerometer data from 100+ red kites in Switzerland, we will explore the activity levels (a proxy for energy expenditure) associated with different migratory strategies

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Exploring the effects of mercury on fitness in a population of European dippers

This project aims to investigate the effects of mercury contamination in European dippers, specifically, by: (1) quantifying mercury levels in bird feathers; (2) assessing the relationship between mercury exposure and different biometric, reproductive, and fitness traits.

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Social phenotype and early-growth conditions in the barn owl (*Tyto alba*)

This project aims to use ANISCA (automatic scale and RFID identifier) data to build social networks, assess quantitative descriptions of social phenotypes and test how early-growth conditions (e.g., brood structure, habitat composition) explain variations in later social behaviour. By identifying drivers of inter-individual variation in social phenotypes, the project will gain insight into mechanisms by which the non-social environment shapes the formation, structures and interacts with the social environment.

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Bird communities in the face of vineyard abandonment and modernization

This project aims to investigate how the current configuration of Valais vineyards influences bird communities and to conduct prospective analyses along a gradient of abandonment. In particular, the effects of parameters such as parcel size, ground vegetation cover, and the presence of semi-natural structures on various community metrics will be analyzed.

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Effects of heatwaves on the behaviour and physiology of nestlings of an urban-breeding species, the Alpine swift (*Tachymarptis melba*)

The aim of this master project will be (i) to determine at what temperatures nesting Alpine swifts experience heat stress, which will be determined foremost using behavioural observations, as well as (ii) to assess the consequences of heat stress on their growth and health, measured using physiological markers.

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Prevalence of Haemosporidian Infections (Haemoproteus, Leucocytozoon, and Plasmodium) in Raptors at the Vogelwarte Rehabilitation Center: Implications for Wildlife Health and Conservation

This study aims to determine the prevalence and diversity of haemosporidian parasites (*Haemoproteus sp.*, *Leucocytozoon sp.*, and *Plasmodium sp.*) in raptors admitted to the Vogelwarte rehabilitation center through blood smear analysis, complemented by PCR when necessary. Blood samples collected as part of routine clinical diagnostics will be used, and clinical signs observed in these birds will be documented.

Contacts:

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Prevalence and Antimicrobial Resistance of Zoonotic Enterobacteria in Wild Birds with Diarrhea at the Vogelwarte Rehabilitation Center

This study aims to systematically assess the prevalence of zoonotic enterobacteria (*Salmonella spp., Campylobacter spp.,* pathogenic *E. coli, Klebsiella spp*., and *Yersinia enterocolitica*) in wild birds admitted to the Vogelwarte rehabilitation center with diarrhea. In parallel, the proportion of isolates exhibiting antimicrobial resistance will be determined, thereby providing insights into potential health risks and informing best practices for wildlife rehabilitation.

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Do factors outside the breeding grounds affect bird population trends?

The aim of this master's project is to learn more about the influence of non-breeding conditions on population dynamics on the breeding grounds. Depending on the interest of the student and the time available, the following questions could be worked on:

- Are trend differences between ecologically similar species with different migration strategies driven by factors playing outside the breeding area?
- Do differences in circannual movement pattern explain differences in breeding population trends?

The results might facilitate a more efficient and targeted allocation of resources to protect the avifauna in Europe and beyond.

Contact: nicolas.strebel@vogelwarte.ch

How do accelerating environmental changes influence bird population trends?

The project aims at improving our understanding of the mechanisms shaping bird abundance changes in Switzerland and Europe. Depending on the interest of the student and the time available, the following questions could be worked on:
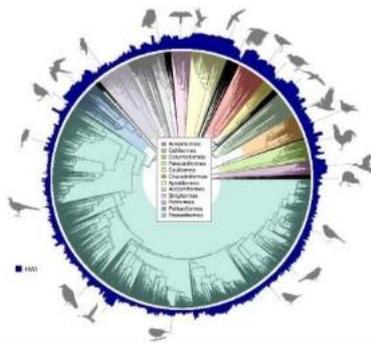
- What are the mechanisms behind spatiotemporal abundance changes of common bird species?

- Do recent population changes match with the relative position of Switzerland within the climatic niche of a species? What local trends can we expect with ongoing climate change

- What are the main drivers underlying strong recent population increases of some species

The results will improve the understanding of the current dynamics in the Swiss avifauna and the impact of climate and land use changes on population dynamics.

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Meta-analysis on drivers of natal dispersal timing across avian species

Aims: The project aims to investigate interspecific differences in the timing of departure as an important characteristic of natal dispersal in birds. The research seeks to understand how morphological, ecological, and life-history traits correlate with the timing of natal dispersal across species. By identifying cross-species factors associated with timing patterns, the project will gain insights into selective forces shaping timing processes during dispersal.

Contact: martin.gruebler@vogelwarte.ch

The expansion of cocoa agriculture in Africa and its possible role in the decline of wood warblers

Aim: The aim of this MSc project is to examine how land-use conversion to cocoa plantations has progressed in Central and Western equatorial Africa over the past decades and if population trends of wood warblers in Europe are related to changes in cocoa plantation extent.

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Using computer vision to count and identify insects from Malaise trap field samples

This project aims to create an automated workflow for the identification and counting of insects collected with Malaise traps, using computer vision techniques. The student will develop a lab setup to spread out the insects from the ethanol samples onto a flat surface, to then take pictures of them to enable testing computer vision algorithms for the automated extraction of numbers, types, and sizes. Building on existing methods and tools, the project aims to develop a dedicated workflow and automated processing specific to flying insect collected using Malaise traps.

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Identifying the breeding status of owl species with acoustic recordings

The goal is to quantitatively describe the relationship between the different call types and the respective reproductive status and also learn about detection probability of the different reproductive status with Passive Acoustic Monitoring (PAM).

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Association between local tree sparrow population declines and recent changes in agricultural practices

This project aims to investigate if regional population trends of tree sparrow populations in Switzerland are associated with recent changes in agricultural practices, potentially exacerbated by climate change. This is a desktop-based data analysis project using pre-produced population and land use data. The student will manage and analyse these datasets and test hypotheses statistically.

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