

## CURRICULUM VITAE

Ole Seehausen

Married, two children

1. Institute of Ecology & Evolution, University of Bern, Baltzerstrasse 6, 3012 Bern, Switzerland

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### **Research interests**

My main interest are the ecological and evolutionary processes that govern the origins and loss of biological diversity. By combining ecological field work (mostly in the Alps and in Africa) with population genomics, and laboratory experiments I attempt to clarify effects of environmental and genomic variation on the processes of adaptation, species formation, species coexistence and assemblage formation. I focus on fish but have worked on birds and bats too.

### **Education**

1987-1989 B.Sc. studies (Vordiplom) in Biology, University of Hanover, Germany

1989-1993 M.Sc. studies (Diplom) in Zoology and Ecology, University of Hanover, Germany and University of Leiden, the Netherlands

1994-1999 PhD in Evolutionary Ecology, Institute for Evolutionary and Ecological Sciences, University of Leiden, the Netherlands; thesis title: "Speciation and species richness in African cichlids" (promotor Paul Brakefield, co-promotors Jacques van Alphen, Frans Witte)

### **Academic positions**

1994-1997 Research Associate, University of Leiden, Institute of Evolutionary and Ecological Sciences, Animal Ecology Division, The Netherlands.

1998-1999 Dutch Science Foundation Research Associate, University of Leiden, Institute of Evolutionary and Ecological Sciences, Animal Ecology Division, The Netherlands.

1999-2001 EU Marie Curie Research Fellow, University of Southampton, School of Biological Sciences, Biodiversity and Ecology Research Division, UK.

2001-2004 Lecturer (B), Ecology and Evolution, Department of Biological Sciences, University of Hull, UK.

2004-ongoing Professor and Eawag Chair of Aquatic Ecology, Co-director Institute of Ecology & Evolution, University of Bern, Switzerland

2004-ongoing Department Head, Department of Fish Ecology and Evolution, Eawag, Center for Ecology, Evolution and Biogeochemistry, Kastanienbaum, Switzerland

2014-ongoing Director, Institute of Ecology & Evolution

### **Service**

2012-2014 Non-North American Vice president, The Society for the Study of Evolution

2011-ongoing Board of Review Editors, Frontiers in Evolutionary and Population Genetics

2008-ongoing Editorial Board, Aquatic Sciences

2009-2011 Editorial Board, Biology Letters

2001-2005 Editorial Board, Journal of Evolutionary Biology

2008-2014 Steering Committee ESF Networking Program Frontiers of Speciation Research (FROSPECTS)

### **Awards**

2001 American Naturalist Young Investigator's Award, American Society of Naturalists

1998 Dutch Zoology Prize. Royal Netherlands Zoological Society

By March 31, 2015, O.S. authored or co-authored 146 publications listed in the ISI Web of Science that were cited 6715 times (average 46), h-index = 41.

Google Scholar Profile <http://scholar.google.ch/citations?user=-qMT0ZAAAAAJ&hl=de>  
169 publications, 9061 citations, h-index = 47

## Larger ongoing projects

2012-15 (June) Population genomics of adaptive radiation. Swiss NSF ProDoc in Population Genomics grant No. PDFMP3\_134657  
2013-16 (June) Measuring ecological and genetic constraints to speciation. Swiss NSF grant no. 31003A\_144046  
2010-16 Projet Lac – quantitative assessment of fish assemblages of deep pre- and subalpine lakes

Bern, 23 June, 2015

## Publications 2010-2015

### 1. Peer-reviewed primary research articles

#### 2015

- Lucek, K, **Seehausen, O.** 2015. Distinctive insular forms of threespine stickleback (*Gasterosteus aculeatus*) from western Mediterranean islands. *Conserv Genet*, DOI 10.1007/s10592-015-0742-0
- Karvonen A, Lucek K, Marques DA, **Seehausen O** 2015. Divergent Macroparasite Infections in Parapatric Swiss Lake-Stream Pairs of Threespine Stickleback (*Gasterosteus aculeatus*). *PLoS ONE* 10(6): e0130579. doi:10.1371/journal.pone.0130579
- Brennan A., Woodward G, **Seehausen O**, Muñoz-Fuentes V, Moritz C, Guelmami A, Abbott R.J, Edelaar P (2015) Hybridization due to changing species distributions: adding problems or solutions to conservation of biodiversity during global change? *Evolutionary Ecology Research* 16
- Stelkens RB, Schmid, C, **Seehausen O.** 2015. Hybrid breakdown in cichlid fish. *PLoS ONE* 10(5): e0127207. doi:10.1371/journal.pone.0127207 (pdf)
- Seehausen O.** 2015. Process and pattern in cichlid radiations - inferences for understanding unusually high rates of evolutionary diversification. *New Phytologist*, doi: 10.1111/nph.13450 (pdf)
- Seehausen O.** 2015. Evolution: Beauty varies with the light, *Nature*, 521, 34–35, doi:10.1038/521034a
- Melián CJ, **Seehausen O**, Eguiluz V, Fortuna MA, Deiner K. 2015. Diversification and Biodiversity Dynamics of Hot and Cold Spots. *Ecography*. DOI:10.1111/ecog.01162

#### 2014

- Brawand D, Wagner CE, Li YI, Malinsky M, Keller I, Fan S, Simakov O, Ng AY, Lim ZW, Bezault E, Turner-Maier J, Johnson J, Alcazar R, Noh HJ, Russell P, Aken B, Alföldi J, Amemiya C, Azzouzi N, Baroiller J-F, Barloy-Hubler F, Berlin A, Bloomquist R, Carleton KL, Conte MA, D'Cotta H, Eshel O, Gaffney L, Galibert F, Gante HF, Gnerre S, Greuter L, Guyon R, Haddad NS, Haerty W, Harris RM, Hofmann HA, Hourlier T, Hulata G, Jaffe DB, Lara M, Lee AP, MacCallum I, Mwaiko S, Nikaido M, Nishihara H, Ozouf-Costaz C, Penman DJ, Przybylski D, Rakotomanga M, Renn SCP, Ribeiro FJ, Ron M, Salzburger W, Sanchez-Pulido L, Santos ME, Searle S, Sharpe T, Swofford R, Tan FJ, Williams L, Young S, Yin S, Okada N, Kocher TD, Miska E, Lander ES, Venkatesh B, Fernald RD, Meyer A, Ponting CP, Streelman JT, Lindblad-Toh K, **Seehausen O**, Di Palma F. 2014. The genomic substrate for adaptive radiation: genomes of five African cichlid fish. *Nature*, doi:10.1038/nature13726
- Downing, A et al. (39 coauthors including **Seehausen O**) 2014. Coupled human and natural system dynamics as key to the sustainability of Lake Victoria's ecosystem. *Ecology and Society* 19(4): 31 <http://dx.doi.org/10.5751/ES-06965-190431>
- Alexander TJ, Vonlanthen P, Periat G, Degiorgi F, Raymond JC, **Seehausen O.** 2014. Evaluating gillnetting protocols to characterize lacustrine fish communities. *Fisheries Research*. 161: 320-329, <http://dx.doi.org/10.1016/j.fishres.2014.08.009>
- Lucek, K, Sivasundar, A, **Seehausen, O.** 2014. Disentangling the role of phenotypic plasticity and genetic divergence in contemporary ecotype formation during a biological invasion. *Evolution*. doi:10.1111/evo.12443
- Lucek K, Sivasundar A, Kristjansson BK, Skulason S, **Seehausen O.** 2014. Quick divergence but slow convergence during ecotype formation in lake and stream stickleback pairs of variable age. *J of Evol Biol*. doi: 10.1111/jeb.12439
- Lucek K, Lemoine M, **Seehausen O.** 2014. Contemporary ecotypic divergence during a recent range expansion was facilitated by adaptive introgression, *J Evol Biol*, doi: 10.1111/jeb.12475
- Schweizer M, Güntert M, **Seehausen O**, Leuenberger L, Hertwig ST. 2014. Parallel adaptations to nectarivory in parrots, key innovations and the diversification of the Loriinae. *Ecol & Evol*. In press
- Lundsgaard-Hansen, B, Matthews, B, **Seehausen, O.** 2014. Ecological speciation and phenotypic plasticity affect ecosystems. *Ecology* 95(10) pp. 2723-2735
- Hudson, AG, Vonlanthen P, **Seehausen O.** 2014. Population structure, inbreeding and local adaptation within an endangered riverine specialist, the nase. *Conserv Genet*, DOI 10.1007/s10592-014-0590-3
- Selz, OM, Pierotti, MER, Maan, ME, Schmid, C, **Seehausen, O.** 2014. Female preference for male color is necessary and sufficient for assortative mating in 2 cichlid sister species. *Behav Ecol*, doi: 10.1093/beheco/aru024
- Wagner, CE, Harmon, LJ, **Seehausen, O.** 2014. Cichlid species-area relationships are shaped by adaptive radiations that scale with area. *Ecol Lett*, doi: 10.1111/ele.12260

Schweizer M, Hertwig S, **Seehausen O**. 2014. Diversity versus disparity and the role of ecological opportunity in a continental bird radiation. *J of Biogeogr*. doi:10.1111/jbi.12293

Selz, OM, Thommen, R, Maan, ME, **Seehausen, O**. 2014. Behavioural isolation may facilitate homoploid hybrid speciation in cichlid fish. *J of Evol Biology*, doi:10.1111/jeb.12287

## 2013

Lucek K, Sivasundar A, Roy D, **Seehausen O**. 2013. Repeated and predictable patterns of ecotypic differentiation during a biological invasion: lake-stream divergence in parapatric Swiss stickleback. *J of Evol Biol*. doi: 10.1111/jeb.12267

Roy D, **Seehausen O**, Nosil P. 2013. Sexual dimorphism dominates divergent host plant use in stick insect trophic morphology. *BMC Evolutionary Biology* 13: 135, doi:10.1186/1471-2148-13-135

Hudson AG, Vonlanthen P, Bezault E, **Seehausen O**. 2013. Genomic signatures of relaxed disruptive selection associated with speciation reversal in whitefish. *BMC Evolutionary Biology* 13: 108

Roesch, C, Lundsgaard-Hansen, B, Vonlanthen, P, Taverna, A, **Seehausen O**. 2013. Experimental evidence for trait utility of gill raker number in adaptive radiation of a north temperate fish. *J of Evol Biol*. doi: 10.1111/jeb.12166

Dijkstra PD, **Seehausen O**, Metcalfe NB. 2013. Metabolic divergence between sibling species of cichlid fish. *J of Fish Biology*, 82, 1975-1989, doi:10.1111/jfb.12125

Lundsgaard-Hansen B, Matthews B, Vonlanthen P, Taverna A, **Seehausen O**. 2013. Adaptive plasticity and genetic divergence in feeding efficiency during parallel adaptive radiation of whitefish (*Coregonus* spp.). *J of Evol Biol*. doi: 10.1111/jeb.12063

Loh EY, Bezault E, Muenzel FM, Roberts RB, Swofford R, Barluenga M, Kidd CE, Howe AE, Di Palma F, Lindblad-Toh K, Hey J, **Seehausen O**, Salzburger W, Kocher TD, Streelman JT. 2013. Origins of Shared Genetic Variation in African Cichlids. *Mol. Biol. Evol*. doi:10.1093/molbev/mss326

Selz, OM, Lucek, K, Young, KA, **Seehausen, O**. 2013. Relaxed trait covariance in interspecific cichlid hybrids predicts morphological diversity in adaptive radiations. *J of Evol Biol*, doi:10.1111/jeb.12283

van der Sluijs I, Dijkstra PD, Lindeyer CM, Visser B, Smith AM, Groothuis TGG, van Alphen JJM, **Seehausen O**. 2013. A test of genetic association among male nuptial coloration, female mating preference, and male aggression bias within apolymorphic population of cichlid fish. *Current Zoology* 59 (2)

Karvonen, A, Lundsgaard-Hansen, B, Jokela, J, **Seehausen, O**. 2013. Differentiation in parasitism among ecotypes of whitefish segregating along depth gradients. *Oikos* 122, 122–128

## 2012

Vonlanthen P, Bittner D, Hudson AG, Young KA, Müller R, Lundsgaard-Hansen B, Roy D, Di Piazza S, Largiader CR, **Seehausen O**. 2012. Eutrophication causes speciation reversal in whitefish adaptive radiations. *Nature*. 482, 357-362

Junker, J, Peter, A, Wagner, CE, Mwaiko, S, Germann, B, **Seehausen, O**, Keller, I. 2012. River fragmentation increases localized population genetic structure and enhances asymmetry of dispersal in bullhead (*Cottus gobio*). *Conservation Genetics*. 13, 545-556

Castillo Cajas, RF, Selz, O, Ripmeester, EAP, **Seehausen, O**, Maan ME. 2012. Species-specific relationships between water transparency and male coloration within and between two closely related Lake Victoria cichlid species. *International J of Evol Biol*, doi:10.1155/2012/161306

Ingram T, Hudson AG, Vonlanthen P, **Seehausen O**. 2012. Does divergence in spawning depth or diet predict progress toward speciation in parallel whitefish radiations? *Evolutionary Ecology Research* 14, 487–502

Joost, S, Kalbermatten, M, Bezault, E, **Seehausen, O**. 2012. Use of Qualitative Environmental and Phenotypic Variables in the Context of Allele Distribution Models: Detecting Signatures of Selection in the Genome of Lake Victoria Cichlids. In *Data Production and Analysis in Population Genomics. Methods in Molecular Biology*, 888, doi: 10.1007/978-1-61779-870-2\_17

Keller I, Wagner CE, Greuter L, Mwaiko S., Selz O., Sivasundar A, Wittwer S, **Seehausen O**. 2012. Population genomic signatures of divergent adaptation, gene flow, and hybrid speciation in the rapid radiation of Lake Victoria cichlid fishes. *Mol Ecol* doi: 10.1111/mec.12083

Keller I, Schuler J, Bezault E, **Seehausen O**. 2012. Parallel divergent adaptation along replicated altitudinal gradients in Alpine trout. *BMC Evolutionary Biology* 12:210 doi:10.1186/1471-2148-12-210

Lucek K, Sivasundar A, **Seehausen O**. 2012. Evidence of adaptive evolutionary divergence during biological invasion. *PLoS One*. 7, doi:10.1371/journal.pone.0049377

Maan ME, **Seehausen O**. 2012. Magic cues versus magic preferences in speciation. *Evolutionary Ecology Research*, 14, 779–785

Magalhaes, IS, Lundsgaard-Hansen, B, Mwaiko, S, **Seehausen, O**. 2012. Evolutionary divergence in replicate pairs of ecotypes of Lake Victoria cichlid fish. *Evolutionary Ecology Research* 14, 381–401

Purnell, M, **Seehausen, O**, Galis, F. 2012. Quantitative 3D microtextural analysis of tooth wear as a tool for dietary discrimination in fishes. *Royal Society Interface* 74, 2225-2233

**Seehausen O**. 2012. Integrating ecology and genetics in speciation research. Book review. *Trends Ecol. Evol.* 28, 12-13

Wagner, CE, Keller, I, Wittwer, S, Selz, O, Mwaiko, S, Greuter, L, Sivasundar, A, **Seehausen, O**. 2012. Genome-wide RAD sequence data provides unprecedented resolution of species boundaries and relationships in the Lake Victoria cichlid adaptive radiation. *Molecular Ecology*. doi: 10.1111/mec.12023

Wagner, CE, Harmon, L, **Seehausen O**. 2012. Ecological opportunity and sexual selection together predict adaptive radiation, *Nature*, 7407, 366-U124

Witte, F, **Seehausen, O**, Wankink, JH, Kische-Machumu, MA, Rensing, M, Goldschmidt T. 2012. Cichlid species diversity in naturally and anthropogenically turbid habitats of Lake Victoria, East Africa. *Aquatic Sciences* doi:10.1007/s00027-012-0265-4

Zeller M, Lucek K, Haesler MP, **Seehausen O**, Sivasundar A. 2012. Signals of predation-induced directional and disruptive selection in the threespined stickleback. *Evolutionary Ecology Research* Vol 14: 193-205

Zeller, M, Lucek, K, Haesler, M, **Seehausen, O**, Sivasundar, A. 2012. Little evidence for a selective advantage of armour-reduced threespined stickleback individuals in an invertebrate predation experiment. *Evolutionary Ecology* 26, 1293-1309

## 2011

Bezault, E, Mwaiko, S, **Seehausen, O**. 2011. Population genomic tests of models of adaptive radiation in Lake Victoria region cichlid fish. *Evolution*. 65, 3381-3397.

Konijnendijk, N, Joyce, DA, Mrosso, HDJ, Egas, M, **Seehausen, O**. 2011. Community genetics reveal elevated levels of sympatric gene flow among morphologically similar but not among morphologically dissimilar species of Lake Victoria cichlid fish. *Intern J of Evol Biol*. doi:10.4061/2011/616320.

Schweizer, M, **Seehausen, O**, Hertwig, ST. 2011. Macroevolutionary patterns in the diversification of parrots - effects of climate change, geological events and key innovations. *J of Biogeogr*, DOI: 10.1111/j.1365-2699.2011.02555.x

Keller, I, Taverna, A, **Seehausen, O**. 2011. Evidence of neutral and adaptive genetic divergence between European trout populations sampled along altitudinal gradients. *Molecular Ecology*, 20, 1888-1904

Joyce DA, Lunt DH, Genner MJ, Turner GF, Bills R, **Seehausen O** 2011. Repeated colonization and hybridization characterize the Lake Malawi cichlids. *Curr Biol*, 21, 108-109 and Supplement (9 pp.)

Svensson, O, Egger, B, Gricar, B, Woodhouse, K, van Oosterhout, C, Salzburger, W, **Seehausen, O**, Turner, GF. 2011. Segregation of species-specific male attractiveness in F2 hybrid Lake Malawi cichlid fish. *Intern J of Evol Biol*. doi:10.4061/2011/426179

Hudson, AG, Vonlanthen, P, **Seehausen, O** 2011. Rapid parallel adaptive radiations from a single hybridogenic ancestral population. *Proc Royal Society of London, Series B*. 278, 58-66

## 2010

Lucek, K, Roy, D, Bezault, E, Sivasundar, A, **Seehausen, O** 2010. Hybridization between distant lineages increases adaptive variation during a biological invasion: stickleback in Switzerland. *Molecular Ecology*. doi: 10.1111/j.1365-294X.2010.04781.x

Keller, I, Taverna, A, **Seehausen O** 2010. A pyrosequencing assay for the rapid discrimination of mitochondrial lineages in the *Salmo trutta* species complex. *Molecular Ecology Resources* doi: 10.1111/j.1755-0998.2010.02897.x

Magalhaes IS, Mwaiko S, **Seehausen O** 2010. Sympatric colour polymorphisms associated with non-random gene flow in cichlid fish of Lake Victoria. *Molecular Ecology*. doi: 10.1111/j.1365-294X.2010.04751.x

Dijkstra PD, Lindström J, Metcalfe NB, Hemelrijk CK, Brendel M, **Seehausen O**, Groothuis TGG 2010. Frequency-dependent social dominance in a color polymorphic cichlid fish. *Evolution* doi:10.1111/j.1558-5646.2010.01046.x

Harmon LJ, Losos JB, Davies TJ, Gillespie RG, Gittleman JL, Jennings WB, Kozak KH, McPeck MA, Moreno-Roark F, Near TJ, Purvis A, Ricklefs RE, Schluter D, Schulte JA, **Seehausen O**, Sidlauskas BL, Torres-Carvajal O, Weir JT, Mooers AO. 2010. Early bursts of body size and shape evolution are rare in comparative data. *Evolution*. 64, 2385-2396

Magalhaes IS, **Seehausen O**. 2010. Genetics of male nuptial colour divergence between sympatric sister species of a Lake Victoria cichlid fish. *J Evol. Biol*. 23, 914-924

Stelkens, R., Young, KA., **Seehausen, O**. 2010. The accumulation of reproductive incompatibilities in African cichlid fishes. *Evolution*. 64, 617-632

Mzighani SI, Nikaido M, Takeda M, **Seehausen O**, Budeba YL, Ngatunga BP, Katunzi EFB, Aibara M, Mizoiri S, Sato T, Tachida H, Okada N. 2010. *Gene* 450, 39-47

Maan ME, **Seehausen O**, Van Alphen JJM. 2010. Female mating preferences and male coloration covary with water transparency in a Lake Victoria cichlid fish. *Biological Journal of the Linnean Society*. 99, 398-406

van der Sluijs I, **Seehausen O**, Van Dooren TJM, Van Alphen JJM. 2010. No evidence for a genetic association between female mating preference and male secondary sexual trait in a Lake Victoria cichlid fish. *Current Zoology* 56, 57-64

Schweizer M, **Seehausen O**, Güntert M, Hertwig ST. 2010. The evolutionary diversification of parrots supports a taxon pulse model with multiple trans-oceanic dispersal events and local radiations. *Molecular Phylogenetics and Evolution*. 54, 984-994

## 2. peer-reviewed review articles

**Seehausen O**. 2015. Process and pattern in cichlid radiations - inferences for understanding unusually high rates of evolutionary diversification. *New Phytologist*. In press

**Seehausen, O**, Wagner, CE. 2014. Speciation in Freshwater Fishes. *Annual Reviews in Ecology, Evolution and Systematics*. In Press.

**Seehausen, O**, Butlin, RK, Keller, I, Wagner, CE et al. 2014. Genomics and the origin of species. *Nature Reviews Genetics*, Vol 14, doi:10.1038/nrg3644

Brodersen J, **Seehausen O**. 2014. Why evolutionary biologists should get seriously involved in ecological monitoring and applied biodiversity assessment programs, *Evolutionary Applications*, ISSN 1752-4571, doi:10.1111/eva.12215

Maan ME, **Seehausen O**. 2012. Magic cues versus magic preferences in speciation. *Evolutionary Ecology Research*, 14, 779–785

Karvonen A, **Seehausen O**. 2012. The role of parasitism in adaptive radiations – when might parasites promote and when might they constrain ecological speciation? *International J of Ecol*, doi:10.1155/2012/280169

Keller I, **Seehausen O**, 2011. Thermal adaptation and ecological speciation. *Molecular Ecology*, 21, 782-799

Maan ME, **Seehausen O**. 2011. Ecology, sexual selection and speciation. *Ecology Letters* 14, 591-602

Maan ME, **Seehausen O**. 2010. Mechanisms of species divergence through visual adaptation and sexual selection: Perspective from a cichlid model system. *Current Zoology* 56, 285-299

### 3. Book contributions

**Seehausen O**. 2012. Der Ursprung der Arten 150 Jahre nach Darwin. In Leutwyler, S. (ed) *Evolution wohin? Darwin's Theorie und ihre Folgen*. In Press.

**Seehausen O**, Magalhaes IS. 2010. Geographical mode and evolutionary mechanism of ecological speciation in cichlid fish. In Grant, P. & Grant, R. (eds) *In Search of the Causes of Evolution*. Princeton University Press. 282-308

### 4. Other pertinent publications

Peer reviewed:

**Seehausen O**. 2013. Conditions when hybridization might predispose populations for adaptive radiation. *J of Evol Biol*. doi: 10.1111/jeb.12026

other

Shiple, L. 2010. Dreampond revisited. *Nature* 466, 174-175. (a journalistic report about my work on evolutionary and conservation biology of Lake Victoria cichlid fish).