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Associate Professor
Department of Forestry and Natural Resources
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EDUCATION

Sep. 2005–May 2011 Ph.D. Department of Forest and Wildlife Ecology, University of Wisconsin-Madison, U.S.A.
Sep. 1994-Jun. 1996 M.S. Department of Biology, National Cheng Kung University.
Sep. 1990-Jun. 1994 B.S. Department of Biology, National Cheng Kung University, Taiwan.

EMPLOYMENT

Aug. 2022-present Associate Professor. Department of Forestry and Natural Resources, National Chiayi University.
Aug. 2013-Jul. 2022 Assistant Professor. Department of Forestry and Natural Resources, National Chiayi University.
Jul. 2012- Jul. 2013 Postdoctoral fellow. Biodiversity Research Center, Academia Sinica, Taiwan. Project: Cooperation and conflict in communal breeding burying beetles (*Nicrophorus nepalensis*).
Adviser: Dr. Sheng-Feng Shen
May 2011-Jun. 2012 Postdoctoral fellow. Department of Forest and Wildlife Ecology, University of Wisconsin-Madison, U.S.A. Project: The effect of wind turbines on birds and bats in a wind energy project in Wisconsin.
Adviser: Dr. David Drake
Jan. 2001-Jul. 2008 Assistant research fellow. Endemic Species Research Institute, Taiwan.
Jul. 1998-Dec. 2000 Senior technician. Forestry Bureau, Council of Agriculture, Taiwan.

RESEARCH INTERESTS

Wildlife Ecology, Wildlife Management and Conservation, Natural Resources Management

PUBLICATIONS

Peer reviewed papers

Görföl, T., C.-C. Huang, G. Csorba, D. Gyorossy, P. Estok, T. Kingston, K. L. Szabadi, E. McArthur, J. Senawi, N. M. Furey, V. T. Tu, V. D. Thong, F. A. A. Khan, E. R. Jinggong, M. Donnelly, J. V. Kumaran, **J.-N. Liu**, S.-F. Chen, M.-N. Tuanmu, Y.-Y. Ho, H.-C.

- Chang, N.-A. E. N.I Abdullah, L.-S. Lim, C. D. Squire and S. Zsebok. 2022. ChiroVox: A public library of bat calls. *Peer J* 10:e12445. DOI 10.7717/peerj.12445
- Chen, S., M.-S. Chuang, H.-J. Shiu, **J.-N. Liu**. 2021. Quantifying the effect of land-cover change on the endangered Farmland Green Treefrog (*Zhangixalus arvalis*) in an agricultural landscape: Implications for conservation. *Zoological Studies* 60:71
- Hsu, C.-W., M.-T. Kao, C.-H. Chou, H.-C. Cheng, **J.-N. Liu**. 2021. Tests of hypotheses for group formation in the subtropical leaf-dwelling bat, *Kerivoula furva*. *Ecology and Evolution* 11:6730-6741.
- Luo, W.-W., M.-T. Kao, **J.-N. Liu**. 2020. Echolocation precursors of pups contain individual signatures in the leaf-roosting Dark Woolly Bat, *Kerivoula furva*. *Acta Chiropterologica* 22(2):337-348.
- Liu, C.-C, C.-H. Chi, S.-C. Yen, **J.-N. Liu**, Y.-T. Ju, C.-L. Kang, C.-H. Chang, and P.-H. Yu. 2020. Blood Lead and Zinc levels and their impacts on health of free living small carnivores in Taiwan, Republic of China 56(1): 157-166.
- Chen, B.-F., Mark, Liu, D. Rubenstein, S.-J. Sun, **J.-N. Liu**, Y.-H. Liu and S.-F Shen. 2020. A Chemically-triggered Transition from Conflict to Cooperation in Burying Beetles. *Ecology Letters* <https://doi.org/10.1111/ele.13445>
- Kao, M.-T, **J.-N. Liu**, H.-C. Cheng and N. Takefumi. 2020. Social signatures in echolocation calls of a leaf-roosting bat, *Kerivoula furva*. *Bioacoustics*, 29(4):461-480.
- Luo, D.-D, and **J.-N. Liu**. 2019. Firefly diversity in Shekou Experimental Forest. *Journal of Agriculture and Forestry, National Chiayi University* 16(2):89-103. (In Chinese)
- Chou, C.-H., G.-J. Weng and **J.-N. Liu**. 2017. Status of mammals along the Nantzuhsienshi logging road in the Yushan National Park in 2017. *Journal of National Park* 27(2):37-50. (In Chinese)
- Drake, D., C. S. Jennelle, **J.-N. Liu**, S. M. Grodsky, S. Schumacher and M. Sponsler. 2015. Regional analysis of wind turbine-caused bat mortality. *Acta Chiropterologica* 17:179-188.
- Chiang, P.-J, K J.-C Pei, M. R. Vaughan, C.-F Lee, M.-T Chen, **J.-N. Liu**, C.-Y Lin, L. -K Lin, and Y.-C Lai. 2015. Reintroduction of clouded leopard (*Neofelis nebulosa*) in Taiwan? A nation-wide assessment of its population status, prey and habitat. *Oryx* 49:261-269.
- Sun, S.-J, D. R. Rubenstein, B.-F Chen, S.-F Chan, **J.-N. Liu**, M. Liu, W. Hwang, P.-S Yang, and S.-F Shen. 2014. Climate-mediated cooperation promotes niche expansion in burying beetles. *eLife*. DOI: <http://dx.doi.org/10.7554/eLife.02440>.
- Liu, J.-N.***, and P.-C. Lucy Hou. 2012. Cutaneous resistance to evaporative water loss in Taiwanese arboreal rhacophorid frogs. *Zool. Stud.* 51:988-995
- Liu, J.-N.***, and W. H. Karasov. 2012. Metabolism during winter in a subtropical hibernating bat, the Formosan leaf-nosed bat *Hipposideros terasensis*. *J. Mammal.* 93:220-228.
- Liu, J.-N.***, and W. H. Karasov. 2011. Hibernation in warm hibernacula by the Formosan leaf-nosed bats, *Hipposideros terasensis*, in subtropical Taiwan. *J. Comp. Physiol. B* 181:125-135.

Symposium Presentations and Posters

- Chou, C.-H., **J.-N. Liu**, H.-C. Cheng and S. Parsons. 2019. Echolocation call variations of Taiwanese bats and call identification by ensembles of artificial neural networks. 18th International Bat Research Conference. 29 Jul.-1 Aug. 2019. Thailand.

- Lin, Y.-S. and J.-N. Liu. 2019. Seasonal variation in use of torpor by a leaf-roosting bat, *Kerivoula furva*, in Subtropical Taiwan. 18th International Bat Research Conference. 29 Jul.-1 Aug. 2019. Thailand.
- Luo, W.-W. and J.-N. Liu. 2019. Mother-offspring recognition in *Kerivoula furva*. 18th International Bat Research Conference. 29 Jul.-1 Aug. 2019. Thailand.
- Kao, M.-T. and J.-N. Liu. 2019. The entrance shape of furled Leaves may be a cue for *Kerivoula furva* roost selection. Thailand, 29 Jul.-1 Aug. 2019.
- Luo, W.-W. and J.-N. Liu. 2018. Social calls used for mother-offspring recognition in *Kerivoula furva*. 4th International Asian Bat Conference. Philippine, 6-9, Aug. 2018.
- Kao, M.-T. and J.-N. Liu. 2018. Vocal communication and roost –switching behavior in *Kerivoula furva*. International Asian Bat Conference. Philippine, 6-9, Aug. 2018.
- Liu, J.-H., H.-C Chen, P.-Y. Chang and C.-C Weng. 2016. Home range, movement and activity of Formosan ferret-badger, *Melogale moschata subaurantiaca*: applications for rabies control in Taiwan. 101st ESA Annual Meeting.
- Chen, S., H.-J. Hsu, M.-S. Chuang, and J.-N. Liu, 2016. The effect of agricultural landuse on farmland green tree frog, *Rhacophorus arvalis*, in Chiayi area, Taiwan. Portland, Oregon, U.S.A. 3-7 Jan. 2016.
- Hsu, C.-W., C.-H. Chou, S.-C. Cheng, and J.-N. Liu, 2015. Roost characteristics and group composition of woolly bat in central Taiwan. 3rd International Southeast Asian Bat Conference. Sarawak, Malaysia, 4-8 Aug. 2015.
- F.-T. Chan, J.-N. Liu, H.-J. Weng, H.-C, Cheng, L.-W. Changchien, and J.-G. Kuo. Formosan ferret-badger a potential reservoir species for rabies in Taiwan. 2015 5th International Wildlife Management Congress. Sapporo, Japan. 26-30 Jul. 2015.
- Lin, Y.-H., K.-F. Lin, I.-Han Chien, K.-S. Lin, F.-T. Chan, and J.-N. Liu. The conservation status and prospect of leopard cat in Taiwan. 2015 5th International Wildlife Management Congress. Sapporo, Japan. 26-30 Jul. 2015.
- Liu, J.-N. 2014. Summer torpor in a free-ranging subtropical bat, *Hipposideros terasensis*: males might use torpor to accumulate fat for mating. 2014 Symposium for Bat Biology. Taichung, Taiwan. 27 April. 2014.
- Drake, D., J.-N. Liu, C. S. Jennelle, S. M. Grodsky, S. Schumacher, and M. Sponsler. 2012. Regional analysis of wind turbine-caused bat fatality. Wind Wildlife Research Meeting. Broomfield, Colorado, U.S.A. 28-30 Nov. 2012.
- Liu, J.-N.*, and W. H. Karasov. 2012. Energetics and use of torpor during summer in a subtropical bat, the Formosan leaf-nosed bat *Hipposideros terasensis*. Oral presentation at The Society for Integrative and Comparative Biology Annual Meeting 2012. Charleston, S. Carolina, U.S.A. 3-7 January 2012.
- Liu, J.-N.*, and W. H. Karasov. 2011. Energetics, thermoregulation, and energy expenditure in winter in the subtropical Formosan leaf-nosed bat *Hipposideros terasensis*. Oral presentation at The Society for Integrative and Comparative Biology Annual Meeting 2011. Salt Lake City, Utah, U.S.A. 2-7 January 2011.
- Liu, J.-N.*, and W. H. Karasov. 2009. Hibernation in warm hibernacula by the Formosan leaf-nosed bats in subtropical Taiwan. Poster at The Wildlife Society 16th Annual Conference. Monterey, California, U.S.A. 20-24 September 2009.

- Liu, J.-N.***, F.-T Chan, and W. Karasov. 2008. Use of torpor by the Formosan leaf-nosed bat, *Hipposideros terasensis*, in winter. Oral presentation at Symposium on Animal Behavior and Ecology. Keelung, Taiwan. 28-29 January 2008. Abstract in Chinese Bioscience 50:32.
- Liu, J.-N.*** 2004. Long-term monitoring of mammal populations at the 21 September 1999 earthquake area of Mt. Chiu-chiu. Oral presentation at Symposium on Monitoring Biodiversity and Habitat Restoration at the 21 September Big Earthquake Area of Mt. Chiuchiu. Nantou, Taiwan. 30 November 2004.
- Cheng H.-C., L.-W. Changchien, and **J.-N. Liu**. 2002. Distribution and population ecology of mountain bats in Taiwan. Symposium on Conservation of Biodiversity. Nantou, Taiwan. 16-17 July 2002.
- Hou, P.-C. L., **J.-N. Liu**, and C. F. Wu. 1996. Metabolic variation and blood oxygen capacity in altitudinal populations of the Taiwanese toad, *Bufo benkorensis*. Abstract in Am. Zool. 36:39A.
- Liu, J.-N.*** and P.-C. L. Hou. 1996. Cutaneous resistance to evaporative water loss of rhacophorid frogs in Taiwan. The 29th Annual Meeting of the Biological Society of China, 25 February 1996. Taipei. Abstract in Chinese Bioscience 39:7.

Books and pamphlets

- Liu, J.-N.** et al. 2018. Wildlife of SheKou Experimental Forest. National Chiayi University.
- Liu, J.-N.** and M.-S. Chuang. 2008. The Frogs of Tung Yen Shan Forest Recreation Area. Forestry Bureau Shinchu District Office. Shinchu. Taiwan. (in Chinese).
- Lien, Y.-Y., H.-Y. Lee, and **J.-N. Liu**. 1999. Introduction to Forest Insects. Forestry Bureau. Taipei. Taiwan. (in Chinese).

Technical Reports

- Liu, J.-N.**, J.-S. Liu, and J.-S. Chang. 2003. Present status and conservation of median-large mammals in low elevations of Taiwan. Nature Conservation Quarterly 43:61-66. (in Chinese).
- Liu, J.-N.** and C.-Y. Lin. 2002. Current status of mammals in Yuli Wildlife Refugee. Nature Conservation Quarterly 39:57-63. (in Chinese).

Supervision

Ph.D.

2015-present Cheng-Han Chou Thesis title: Effects of land use on bats evaluated by species distribution model, maximum entropy, and artificial neural network bat identification system in Taiwan.

Master

2022 Wei-Jung Chen Development and communicating function of echolocation precursors in pups of *Hipposideros armiger terasensis*. MS thesis. Department of Forestry and Natural Resources, National Chiayi University.

- 2021 Chun-You Yeh Resource use of three sympatric insectivorous bats in Kenting National Park. MS thesis. Department of Forestry and Natural Resources, National Chiayi University.
- 2021 Chiuan-You Yan Estimation of population density of the leopard cat (*Prionailurus bengalensis*) using camera traps in central Taiwan. MS thesis. Department of Forestry and Natural Resources, National Chiayi University.
- 2021 Yu-Xuan Yao Using roadkills to study the population age structure of Formosan ferret badgers, *Melogale moschata subaurantiaca*, and its relation to rabies. MS thesis. Department of Forestry and Natural Resources, National Chiayi University.
- 2020 Wen-Wen Lo Development and function of pups' echolocation precursors in *Kerivoula furva*. MS thesis. Department of Forestry and Natural Resources, National Chiayi University.
- 2020 Ying-Ru Chen Population viability analysis of leopard cat (*Prionailurus bengalensis chinensis*) in Taiwan. MS thesis. Department of Forestry and Natural Resources, National Chiayi University.
- 2019 Pei-Tsen Liao, Weather conditions influence the migratory behavior of Chinese Sparrowhawk (*Accipiter soloensis*) along the East Asian Oceanic Flyway. MS thesis. Department of Forestry and Natural Resources, National Chiayi University.
- 2018 Yu-Sheng Lin Seasonal variations in use of torpor in dark woolly bat, *Kerivoula furva*, in Wushihkeng area, Taichung. MS thesis. Department of Forestry and Natural Resources, National Chiayi University.
- 2017 Po-Chun Chen Effects of thinning on mammal and bird diversity of a Taiwania (*Taiwania cryptomerioides*) plantation and adjacent natural forest in Renlun Forest Road. MS thesis. Department of Forestry and Natural Resources, National Chiayi University.
- 2016 Chao-Ping Farnq Distribution and habitat use of leopard cat (*Prionailurus bengalensis chinensis*) in Nantou area. MS thesis. Department of Forestry and Natural Resources, National Chiayi University.
- 2016 Sin Chen The effect of agricultural landuse change on farmland green tree frog (*Rhacophorus arvalis*) in Chiayi area. MS thesis. Department of Forestry and Natural Resources, National Chiayi University.
- 2016 Chia-Wei Hsu Day roost characteristics, population structure and social organization of leaf-roosting Taiwanese woolly bat, *Kerivoula* sp. MS thesis. Department of Forestry and Natural Resources, National Chiayi University.

GRANTS

- 2021-2022 Research Grants. Roles of genetic relatedness, vocalizations and group movements in social group formation and adhesion of *Kerivoula furva*. The Ministry of Science and Technology, US\$33,000.
- 2021 Research Grants. Monitoring of leopard cat population fluctuation. Forestry Bureau, COA, US\$120,000.

- 2021 Research Grants. Optimization of long-term wildlife monitoring system and data integration. Forestry Bureau, COA, US\$33,000.
- 2020-2021 Research Grants. Bat fauna surveys in Kengting National Park. Kenting National Park Headquarters. US\$60,000.
- 2019-2021 Research Grants. Carnivores investigation and conservation in lowland areas of Chiayi and Tainan. Forestry Bureau Chiayi Forest District Office. US\$95,000.
- 2018-2020 Research Grants. Camera monitoring project on wildlife. Forestry Bureau, COA, US\$100,000.
- 2019-2020 Research Grants. Density estimates and action plan development of the leopard cat. Endemic Species Research Institute. COA. US\$60,000.
- 2019 Research Grants. Mammals investigation in Taijiang National Park. Taijiang National Park. US\$32,000.
- 2019 Research Grants. Ecology and Ferret Badger: in relation to rabies prevention and control V. Bureau of Animal and Plant Health Inspection and Quarantine, COA. US\$33,000.
- 2018-2019 Research Grants. The applications of artificial neural networks and species distribution models on bat conservation. The Ministry of Science and Technology, US\$27,000.
- 2018 Research Grants. Ecology and Ferret Badger: in relation to rabies prevention and control IV. Bureau of Animal and Plant Health Inspection and Quarantine, COA. US\$33,000.
- 2017 Research Grants. Ecology and Ferret Badger: in relation to rabies prevention and control III. Bureau of Animal and Plant Health Inspection and Quarantine, COA. US\$33,000.
- 2016 Research Grants. Ecology and Ferret Badger: in relation to rabies prevention and control II. Bureau of Animal and Plant Health Inspection and Quarantine, COA. US\$47,000.
- 2015 Research Grants. Ecology and Ferret Badger: in relation to rabies prevention and control I. Bureau of Animal and Plant Health Inspection and Quarantine, COA. US\$47,000.
- 2015 Research Grants. Ecology and conservation of Leopard cat in Nantou County. Forestry bureau Nantou District Office. US\$28,000.
- 2014 Research Grants. Ecology and genetic diversity of Formosan ferret-badger, *Melogale moschata subaurantiaca*, in western Taiwan. Forestry Bureau, COA. US\$45,000.
- 2014 Research Grants. Ecology and conservation of Leopard cat in Nantou County. Forestry bureau Nantou District Office. US\$30,000.
- 2012 Travel scholarship. The Henry L. Russell Memorial Fund. UW-Madison. US\$400.
- 2011 Vilas Conference Presentation Funds. The Graduate Student Collaborative, UW-Madison. US\$600.
- 2010 Travel scholarship. The Henry L. Russell Memorial Fund. UW-Madison. US\$250.
- 2008 Vilas Travel Grant. The Graduate Student Collaborative, UW-Madison. US\$600.
- 2005-2008 Government Grant for studying abroad. Ministry of Education, Taiwan. (covers tuition and living expenses).
- 2004 Research Grant. Survey of amphibians at Tung Yen Shan Forest Recreation Area. Forestry Bureau Shinchu District Office, Taiwan. US\$9,000.

RESEARCH EXPERIENCE

- 2013-present Assistant professor. Ecology and conservation of mammals in Taiwan.
- 2012-2013 Postdoctoral fellow. Cooperation and conflict in communal breeding burying beetles (*Nicrophorus nepalensis*). Biodiversity Research Center, Academia Sinica, Taiwan.
- 2011-2012 Postdoctoral fellow. The effect of wind turbines on birds and bats in a wind energy project in Wisconsin. UW-Madison, U.S.A.
- 2007-2008 Research associate. The effect of human disturbance on behavior and physiology of Formosan leaf-nosed bat *Hipposideros terasensis*. Endemic Species Research Institute, Taiwan.
- 2004 Research associate. Survey of amphibians at Tung Yen Shan Forest Recreation Area. Forestry Bureau Shinchu District Office, Taiwan.
- 2002-2004 Research associate. Distribution and genetic variation of felines in Taiwan. Endemic Species Research Institute, Taiwan.
- 2001-2004 Research associate. Mammalian diversity in the 21 September 1999 earthquake area of Mt. Chiuchiu. Endemic Species Research Institute, Taiwan.
- 1994-1995 Research assistant. Altitudinal adaptation of the Taiwanese toad, *Bufo bankorensis*. Department of Biology, National Cheng Kung University. Taiwan.

COURSE TAUGHT

Introduction to Wildlife Zoology
Management of National Parks
Environmental Education and Interpretation
Wildlife Management
Advanced Topics in Conservation Biology
Plant-Animal Interactions
Environment and biodiversity

INVITED PRESENTATIONS

- 04 Apr. 2018 Ecology of Formosan ferret-badgers: implication on rabies control. Ministry of Health and Welfare. (in Chinese)
- 13 Nov. 2017 Ecology of wild carnivores in Chinese Taipei. 2017 APEC Wildlife Rabies Workshop.
- 30 Mar. 2016 Ecology of woolly bats. National Pingtung University of Science and Technology, Taiwan (In Chinese)
- 15 Mar. 2016 Wildlife conservation in lowland areas. National Cheng Kung University, Taiwan (in Chinese)
- 7 Apr. 2015 Feline conservation in Taiwan. National Cheng Kung University, Taiwan (in Chinese)
- 18 Oct. 2012 Torpor and hibernation ecology in subtropical bats. National Cheng Kung University, Taiwan. (In English)

- 13 Oct. 2009 Use of torpor in a subtropical bat. Undergraduate Zoological Society, UW-Madison. U.S.A. (In English)
- 2 Nov. 2004 Mammals of Taiwan. Yunlin County Veterinary Association, Taiwan.
- 23 Mar. 2004 Conservation of mammals in Taiwan. Yushan National Park, Taiwan.
- 25 Aug. 2003 Methodology for mammal survey. Endemic Species Research Institute, Taiwan.
- 5 Nov. 2000 The amphibians of Taiwan. Forestry Bureau Shinchu District Office, Taiwan.
- 15 Aug. 2000 Conservation of amphibians. Taiwan Forestry Bureau, Taiwan.

THESES EXAMED

Doctoral

- 2021 Ian Nicholas Best Of pests and prey: investigating the dual role of rodents from their responses to predation risk to their involvement as pests in agriculture. Ph.D. dissertation. Department of Life Sciences, National Normal University, Taiwan.
- 2018 Hari Prasad Sharma Conservation of the red panda (*Ailurus fulgens*) in Nepal: predicting red panda distribution, habitat use and assessing people's attitudes towards red panda conservation. Ph.D. dissertation. Department of Life Sciences, National Normal University, Taiwan.

Master

- 2021 I-Ting Tai Anthropogenic effects on the diet of small carnivores in lowland Taiwan. Master thesis. Department of Life Sciences, National Normal University, Taiwan.
- 2020 Jia-Hao Chang Spatiotemporal niche partitioning between two sympatric murid rodents in Taiwan. Master thesis. Department of Life Sciences, National Normal University, Taiwan.
- 2019 Hong-Kie Liao Effect of invasive species on the assemblage of parasite community of native amphibians: A case study of banded bull-frog (*Kaloula pulchra*) and Asian toad (*Duttaphrynus melanostictus*) in Taiwan
- 2019 Li-Yue Wu Home range, activity pattern and habitat use of Dark woolly bat (*Kerivoula furva*) in Wushikeng area, central Taiwan. Master thesis. Institute of Wildlife Conservation, National Pingtung University of Science and Technology, Taiwan.
- 2018 You-Cheng Yu Macrophysiological traits in thermoregulation of tropical butterflies. Master thesis. Department of Biological Resources, National Chiayi University, Taiwan.
- 2016 Chien-An Chiang Home range and population density of Formosan ferret badger (*Melogale moschata subaurantiaca*) along Daan River. Master thesis. Institute of Wildlife Conservation, National Pingtung University of Science and Technology, Taiwan.
- 2014 Wei Liang Body mass condition in the Yellow-margined box turtle (*Cuora flavomarginata*): Variation in wild and captive environments. Master thesis. Institute of Wildlife Conservation, National Pingtung University of Science and Technology, Taiwan.

PROFESSIONAL SERVICE

2017-present Associate editor. Zoological Studies
2016 Journal Reviewer for: Canadian Journal of Zoology
2014-present Journal Reviewer for: Zoological Studies
2013, 2014, 2015 Journal Reviewer for: Taiwan Journal of Biodiversity
2012 Journal Reviewer for: Canadian Journal of Zoology
2003-2004 Editor. Nature Conservation Quarterly. Endemic Species Research Institute,
Taiwan. (in Chinese).

PROFESSIONAL AFFILIATIONS

Ecological Society of America.
The Society for Integrative and Comparative Biology
The Bat Conservation International
The Wildlife Society
Bat Association of Taiwan