



Great Lakes Fishery Commission Pulse on Science: Deliverables

This bi-annual newsletter lists titles and abstracts for recently completed, Commission-funded research projects and links to associated media coverage and publications.

Questions about any of the research below? Contact research@glfc.org.

Science Transfer Program:

Alternative barrier technologies: history as a control tool

Zielinski, D.

October 2018

Abstract: http://www.glfc.org/pubs/pdfs/research/reports/2017_ZIE_77012.htm

Products:

- Comprehensive review of sea lamprey barrier technologies
http://www.glfc.org/pubs/pdfs/research/Zielinski_barriers_full%20deck_Final.pdf

Changes in nutrient status and energy flow through lower trophic levels: implications for Great Lakes fishery managers

Stewart, T.

December 2018

Abstract: http://www.glfc.org/pubs/pdfs/research/reports/2017_STE_77010.htm

Products:

- Proceedings from the Fisheries Management Implications of Lower Trophic Level Change Workshop
<http://www.glfc.org/pubs/pdfs/research/Stewart-Fisheries%20Management%20Implications%20of%20Lower%20Trophic%20Level%20Change%20-%20Proceedings%20of%20Workshop%20I.pdf>
- Presentation on the Influence of Lower Trophic Levels on Fisheries: Possible Elements of a Fact Sheet
http://www.glfc.org/pubs/pdfs/research/Stewart-Presentation%20to%20CLC_Oct%2015%202018.pdf

Fishery Research Program:

Council of Lake Committees Priorities

Quantitative tools for assessing and managing cisco populations

Bence, J.

December 2018

Abstract: http://www.glfc.org/pubs/pdfs/research/reports/2016_BEN_44053.html

Products:

- Fisch, N.C., J.R. Bence, J.T. Myers, E.K. Berglund, and D.L. Yule. 2019. A comparison of age- and size-structured assessment models applied to a stock of cisco in Thunder Bay, Ontario. Fisheries Research 209:86-100.
<https://www.sciencedirect.com/science/article/pii/S0165783618302492>
- Fisch, N.F., and J.R. Bence. 2018. Sampling intensity, aging intensity, and its effect on age-structured assessment of cisco in Thunder Bay. QFC Technical Report T2018-02, East Lansing, Michigan. <https://www.canr.msu.edu/qfc/publications/pdf-techreports/2017-techreports/T2018-02.pdf>

Energy and Nutrient Dynamics of the Great Lakes

Fate of veliger production and trophic linkages within Lake Ontario

Currie, W.

September 2018

Abstract: http://www.glfrc.org/pubs/pdfs/research/reports/2017_CUR_44069.html

Re-establishment of Native Deep-water Fishes

Evaluation of lake trout habitat selection at Drummond Island spawning reefs

Binder, T.

December 2018

Abstract: http://www.glfrc.org/pubs/pdfs/research/reports/2013_BIN_44024.html

Products:

- Binder T.R., Farha S.A., Thompson H.T., Holbrook C.M., Bergstedt R.A., Riley S.C., Bronte C.R., He J., and C.C. Krueger. 2018. Fine-scale acoustic telemetry reveals unexpected lake trout, *Salvelinus namaycush*, spawning habitats in northern Lake Huron, North America. Ecology of Freshwater Fish 27, 594–605.
<https://onlinelibrary.wiley.com/doi/pdf/10.1111/eff.12373>
- Grimm A.G., Brooks C.N., Binder T.R., Riley S.C., Farha S.A., Shuchman R.A., and C.C. Krueger. 2016. Identification of lake trout *Salvelinus namaycush* spawning habitat in northern Lake Huron using high-resolution satellite imagery. Journal of Great Lakes Research. 42, 127–135.
<https://www.sciencedirect.com/science/article/pii/S038013301500266X>

Non-theme

Evaluating the use of an angler smartphone app for fisheries data collection

Venturelli, P.

September 2018

Abstract: http://www.glfrc.org/pubs/pdfs/research/reports/2015_VEN_44043.html

Sea Lamprey Research Program:

Barriers and Trapping

Evaluation of light as a non-physical cue to downstream-migrating lamprey transformers into traps

Haro, A.

December 2018

Abstract: http://www.glfrc.org/pubs/pdfs/research/reports/2017_HAR_54064.htm

Lampricides

Elucidation of the TFM metabolisms in sea lamprey and non-target fish

Li, W.

December 2018

Abstract: http://www.glf.org/pubs/pdfs/research/reports/2017_LIW_54066.htm

Products:

- Bussy, U., Chung-Davidson, Y-W., Buchinger, T. et al. Metabolism of a sea lamprey pesticide by fish liver enzymes part A: identification and synthesis of TFM metabolites. *Anal Bioanal Chem* (2018) 410: 1749.
<https://link.springer.com/article/10.1007%2Fs00216-017-0830-8>
- Bussy, U., Chung-Davidson, Y-W., Buchinger, T. et al. Metabolism of a sea lamprey pesticide by fish liver enzymes part B: method development and application in quantification of TFM metabolites formed in vivo. *Anal Bioanal Chem* (2018) 410: 1763.
<https://link.springer.com/article/10.1007%2Fs00216-017-0831-7>

Chemosensory Communications

Structure and function of sea lamprey pheromone components (Phase II)

Li, W.

December 2018

Abstract: http://www.glf.org/pubs/pdfs/research/reports/2015_LIW_54032.htm

Products:

- Li, K., Huertas, M., Brant, C., Chung-Davidson, Y. W., Bussy, U., Hoyer, T. R., & Li, W. (2014). (+)- and (-)-petromyroxols: antipodal tetrahydrofurandiols from larval sea lamprey (*Petromyzon marinus* L.) that elicit enantioselective olfactory responses. *Organic letters*, 17(2), 286-289.
<https://pubs.acs.org/doi/abs/10.1021/ol5033893?journalCode=orlef7>
- Li, K., Brant, C. O., Bussy, U., Pinnamaneni, H., Patel, H., Hoyer, T. R., & Li, W. (2015). iso-Petromyroxols: Novel Dihydroxylated Tetrahydrofuran Enantiomers from Sea Lamprey (*Petromyzon marinus*). *Molecules*, 20(3), 5215-5222.
<https://www.mdpi.com/1420-3049/20/3/5215>
- Li, K., Brant, C. O., Huertas, M., Hessler, E. J., Mezei, G., Scott, A. M., ... & Li, W. (2018). Fatty-acid derivative acts as a sea lamprey migratory pheromone. *Proceedings of the National Academy of Sciences*, 115(34), 8603-8608.
<https://www.pnas.org/content/115/34/8603>
- Li, K., Scott, A. M., Brant, C. O., Fissette, S. D., Riedy, J. J., Hoyer, T. R., & Li, W. (2017). Bile salt-like dienones having a novel skeleton or a rare substitution pattern function as chemical cues in adult sea lamprey. *Organic letters*, 19(17), 4444-4447.
<https://pubs.acs.org/doi/10.1021/acs.orglett.7b01921>
- Li, K., Scott, A. M., Riedy, J. J., Fissette, S., Middleton, Z. E., & Li, W. (2017). Three novel bile alcohols of mature male sea lamprey (*Petromyzon marinus*) act as chemical cues for conspecifics. *Journal of chemical ecology*, 43(6), 543-549.
<https://frontiersinzoology.biomedcentral.com/articles/10.1186/s12983-015-0126-9>
- Li, K., Scott, A., Fissette, S., Buchinger, T., Riedy, J., & Li, W. (2018). Petromyridenes A–C: 2-Alkylidene Bile Salt Derivatives Isolated from Sea Lamprey (*Petromyzon marinus*). *Marine drugs*, 16(9), 308.
<https://www.mdpi.com/1660-3397/16/9/308>

- Brant, C. O., Johnson, N. S., Li, K., Buchinger, T. J., & Li, W. (2015). Female sea lamprey shift orientation toward a conspecific chemical cue to escape a sensory trap. *Behavioral Ecology*, 27(3), 810-819.
<https://academic.oup.com/beheco/article/27/3/810/2365716>
- Brant, C. O., Li, K., Johnson, N. S., & Li, W. (2015). A pheromone outweighs temperature in influencing migration of sea lamprey. *Royal Society open science*, 2(5), 150009.
<https://royalsocietypublishing.org/doi/full/10.1098/rsos.150009>
- Brant, C. O., Huertas, M., Li, K., & Li, W. (2016). Mixtures of two bile alcohol sulfates function as a proximity pheromone in sea lamprey. *PLoS one*, 11(2), e0149508.
<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0149508>
- Buchinger, T. J., Bussy, U., Buchinger, E. G., Fissette, S. D., Li, W., & Johnson, N. S. (2017). Increased pheromone signaling by small male sea lamprey has distinct effects on female mate search and courtship. *Behavioral Ecology and Sociobiology*, 71(10), 155.
<https://link.springer.com/article/10.1007%2Fs00265-017-2384-3>
- Li, K., Chung-Davidson, Y. W., Bussy, U., & Li, W. (2015). Recent advances and applications of experimental technologies in marine natural product research. *Marine drugs*, 13(5), 2694-2713.
<https://www.mdpi.com/1660-3397/13/5/2694>
- Li, K., Buchinger, T. J., & Li, W. (2018). Discovery and characterization of natural products that act as pheromones in fish. *Natural product reports*, 35(6), 501-513.
<https://pubs.rsc.org/en/Content/ArticleLanding/2018/NP/C8NP00003D#!divAbstract>
- Li, K., Scott, A. M., Chung-Davidson, Y. W., Bussy, U., Patel, T., Middleton, Z. E., & Li, W. (2016). Quantification of Oxidized and Unsaturated Bile Alcohols in Sea Lamprey Tissues by Ultra-High Performance Liquid Chromatography-Tandem Mass Spectrometry. *Molecules*, 21(9), 1119.
<https://www.mdpi.com/1420-3049/21/9/1119>

**Bioassay directed isolation and characterization of a natural sea lamprey deterrent
Nair, M.**

December 2018

Abstract: http://www.glfrc.org/pubs/pdfs/research/reports/2016_NAI_54051.htm

Products:

- Dissanayake AA, Wagner CM, Nair MG (2016) Chemical Characterization of Lipophilic Constituents in the Skin of Migratory Adult Sea Lamprey from the Great Lakes Region. *PLOS ONE* 11(12): e0168609. DOI:10.1371/journal.pone.0168609.
<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0168609>