



## 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](mailto:research@glfc.org).

### Fishery Research Program:

#### Re-establishment of Native Deep-water Fishes

##### **Ecology and evolution of Blackfin cisco populations in an outflow system of proglacial Lake Algonquin**

Turgeon, J.

May 2020

Abstract: <http://www.glfc.org/pubs/pdfs/research/reports/2016 RID 44054.htm>

Products:

- Bell, A., Piette-Lauzière, G., Turgeon, J., Ridgway, M. 2019. Cisco Diversity in a Historical Drainage of Glacial Lake Algonquin. Canadian Journal of Zoology 97(8): 736-747. <https://doi.org/10.1139/cjz-2018-0233>
- Piette-Lauzière, G., Bell, A., Ridgway, M., Turgeon, J. 2019. Evolution and Diversity of two cisco forms in an outlet of glacial Lake Algonquin. Ecology and Evolution 9(17): 9653-9670. <https://doi.org/10.1002/ece3.5496>
- Turgeon, J., Piette-Lauzière, G., Ridgway MS, Turgeon, J. (in prep). Postglacial recolonization by North American Ciscos: a new phylogeographic hypothesis.
- Ridgway, M., Piette-Lauzière G., Bell, A., Turgeon, J., (in prep). Isotopic Niche Size of Cisco Increases in the Presence of Mysis, Expanded Habitat Use and Phenotypic Diversity.

### Sea Lamprey Research Program:

#### Barriers and Trapping

##### **Proof of concept test of flow velocity enhancement system (FVES) to guide sea lamprey movement**

Zielinski, D.

January 2020

Abstract: <http://www.glfc.org/pubs/pdfs/research/reports/2019 ZIE 540880.htm>

Products:

- Zielinski, D.P., Miehl, S., Burns, G., and Coutant, C. Sea lamprey responds to induced flows in a low current system. <https://www.tandfonline.com/doi/full/10.1080/24705357.2020.1775504>
- Zielinski, D.P., Miehl, S., Burns, G., and Coutant, C. Proof of concept test of flow velocity enhancement system (FVES) to guide fish movement in a low current system. *Barrier and Trapping Task Force Meeting*, September 2019, Marquette, MI.

## Non-Theme

### **Seawater tolerance and feeding in freshwater and anadromous populations of sea lamprey**

McCormick, S.

May 2020

Abstract: [http://www.glfrc.org/pubs/pdfs/research/reports/2016\\_MCC\\_54056.htm](http://www.glfrc.org/pubs/pdfs/research/reports/2016_MCC_54056.htm)

## Technical Assistance Program

### **Development and evaluation of improved TFM formulations for use in feeder stream treatments**

Luoma, J.

May 2020

Abstract: [http://www.glfrc.org/pubs/pdfs/research/reports/2018\\_LAN\\_76012.htm](http://www.glfrc.org/pubs/pdfs/research/reports/2018_LAN_76012.htm)

Products:

- Kirkeeng, C.A. and Schueller, J.R. (2020). TFM pellet and bar reformulation update. Presented at the 24th Sea Lamprey Annual Workshop. Traverse City, MI, January 22-23, 2020
- Luoma, J.A., Schloesser, N.A. 2020. Data Release: Development and Evaluation of an Improved TFM Formulation for Use in Feeder Stream Treatments. U.S. Geological Survey. Data Release. <https://doi.org/10.5066/P928SZH8>.

### **Capture efficiency of sea lamprey and passage success of non-target species during plunging and streaming flow patterns in a pool-type fishway**

Lewandowski, S.

June 2020

Abstract: [http://www.glfrc.org/pubs/pdfs/research/reports/2018\\_LEW\\_76013.htm](http://www.glfrc.org/pubs/pdfs/research/reports/2018_LEW_76013.htm)

Products:

- Lewandoski, S., Hrodey, P., Miehl, S., Piszczek, P., Zielinski, D. Behavioral responses of sea lamprey *Petromyzon marinus* and white sucker *Catostomus commersonii* to turbulent flow during fishway passage attempts. Canadian Journal of Fisheries and Aquatic Science In Review.
- Lewandoski, S. (February 15, 2019). STOP Sea Lamprey – GO Fish! <https://www.fws.gov/midwest/fisheries/fishlines/fieldfocus.html>
- Lewandoski, S. “Hydraulic Conditions Influence Capture and Upstream Passage of White Sucker and Invasive Sea Lamprey in a Pool-type Fishway”. Society for Freshwater Science Annual Meeting, May 2019. Salt Lake City, UT.
- Lewandoski, S. “Effects of Fishway Configuration and Water Temperature on Fish Passage in the Brule River”. Sea Lamprey Biannual Workshop, January 2020. Traverse City, MI.

### **Incorporation of expert judgement in an operating model of the control program to evaluate trade-offs for sea lamprey management**

Dawson, H.

July 2020

Abstract: [http://www.glfrc.org/pubs/pdfs/research/reports/2019\\_JON\\_760140.htm](http://www.glfrc.org/pubs/pdfs/research/reports/2019_JON_760140.htm)

Products:

- Miehl S, Dawson HA, Maguffee AC, Johnson NS, Jones ML, and Dobiesz N. In press. Where you trap matters: implications for integrated sea lamprey management. J. Gt. Lakes Res. Sea Lamprey International Symposium III. Special Volume.
- Miehl S, Dawson HA, Maguffee AC, Johnson NS, Jones ML, Dobiesz N. Trapping for control options using the SLaMSE model. Oral presentation to the Sea Lamprey Trapping Task Force, February 2020, Ann Arbor, MI.
- Miehl S, Dawson HA, Maguffee AC, Johnson NS, Jones ML, Dobiesz N. Trapping for control options using the SLaMSE model. Oral Presentation at the 24th Sea Lamprey Annual Workshop, January 2020, Traverse City, MI.

Other recent publications from previously-funded GLFC projects (SLRP)\*

\*This list may not be all-inclusive

Adams, J. V., & Jones, M. L. 2020. Evidence of host switching: Sea lampreys disproportionately attack Chinook salmon when lake trout abundance is low in Lake Ontario. Journal of Great Lakes Research. <https://doi.org/10.1016/j.jglr.2020.03.003>

Buchinger, T.J., Scott, A.M, Fissette, S.D., Brant, C.O., Huertas, M., Johnson, N.J., Li, W. 2020. A pheromone antagonist liberates female sea lamprey from a sensory trap to enable reliable communication. Proceedings of the National Academy of Sciences. 117 (13) 7284-7289. <https://doi.org/10.1073/pnas.1921394117>

Chung-Davidson, Y.-W., Ren, J., Yeh, C.-Y., Bussy, U., Huerta, B., Davidson, P.J., Whyard, S. and Li, W. 2020. TGF- $\beta$  Signaling Plays a Pivotal Role During Developmental Biliary Atresia in Sea Lamprey (*Petromyzon marinus*). Hepatol Commun, 4: 219-234. <https://doi.org/10.1002/hep4.1461>

Chung-Davidson, Y. W., Bussy, U., Fissette, S. D., Huerta, B., & Li, W. (2020). Waterborne pheromones modulate gonadotropin-inhibitory hormone levels in sea lamprey (*Petromyzon marinus*). *General and Comparative Endocrinology*, 288, 113358. <https://doi.org/10.1016/j.ygcen.2019.113358v>

Huerta, B., Chung-Davidson, Y. W., Bussy, U., Zhang, Y., Bazil, J. N., & Li, W. (2020). Sea lamprey cardiac mitochondrial bioenergetics after exposure to TFM and its metabolites. *Aquatic Toxicology*, 219, 105380. <https://doi.org/10.1016/j.aquatox.2019.105380>

Hume, J.B., Luhring, T.M. & Wagner, C.M. 2020. Push, pull, or push-pull? An alarm cue better guides sea lamprey towards capture devices than a mating pheromone during the reproductive migration. Biol Invasions 22, 2129–2142. <https://doi.org/10.1007/s10530-020-02242-4>

Lewandoski, S., Bravener, G.A., Hrodey, P.J., Miehl, S.M. 2020. Environmental and Biological Factors Influence Migratory Sea Lamprey Catchability: Implications for Tracking Abundance in the Laurentian Great Lakes. Journal of Fish and Wildlife Management. 11 (1): 68–79. doi: <https://doi.org/10.3996/022019-JRWM-013>

Johnson, N.S., Lewandoski, S.A., Alger, B.J. et al. Behavioral Responses of Sea Lamprey to Varying Application Rates of a Synthesized Pheromone in Diverse Trapping Scenarios. J Chem Ecol 46, 233–249 (2020). <https://doi.org/10.1007/s10886-020-01151-z>

Miehls, S., Sullivan, P., Twohey, M., Barber, J., McDonald, R. 2020. The future of barriers and trapping methods in the sea lamprey (*Petromyzon marinus*) control program in the Laurentian Great Lakes. *Rev Fish Biol Fisheries* 30, 1–24. <https://doi.org/10.1007/s11160-019-09587-7>

Sard, N. M., Smith, S. R., Homola, J. J., Kanefsky, J., Bravener, G., Adams, J. V., Holbrook, C. M., Hrodey, P. J., Tallon, K., & Scribner, K. T. 2020. RAPTURE (RAD capture) panel facilitates analyses characterizing sea lamprey reproductive ecology and movement dynamics. *Ecology and evolution*, 10(3), 1469–1488. <https://doi.org/10.1002/ece3.6001>

Other recent publications from previously-funded GLFC projects (FRP)\*

\*This list may not be all-inclusive

Dippold, D.A., Aloysius, N., Keitzer, S.C., Yen, H., Arnold, J.G., Daggupati, P., Fraker, M.E., Martin, J.F., Robertson, D.M., Sowa, S.P., Johnson, M.V., White, M.J. Ludsin, S.A. 2020. Forecasting the combined effects of anticipated climate change and agricultural conservation practices on fish recruitment dynamics in Lake Erie. *Freshwater Biology* 2020(65), 1487-1508. <https://doi.org/10.1111/fwb.13515>

Dippold, D.A., Adams, G.D., & Ludsin, S.A. 2020. Spatial patterning of walleye recreational harvest in Lake Erie: Role of demographic and environmental factors. *Fisheries Research*, 230(2020), 105676. <https://doi.org/10.1016/j.fishres.2020.105676>

Fraker, M.E., Keitzer, S.C., Sinclair, J.S., Aloysius, N.R. Dippold, D.A., Haw, Y., Arnold, J.G., Daggupati, P., Johnson, M.V., Martin, J.F., Robertson, D.M., Sowa, S.P., White, M.J., & Ludsin, S.A. 2020. Projecting the effects of agricultural conservation practices on stream fish communities in a changing climate. *Science of the Total Environment* 747(2020) 14112. <https://doi.org/10.1016/j.scitotenv.2020.141112>

Griffin, J.E., O'Malley, B.P., & Stockwell, J.D. 2020. The freshwater mysid *Mysis diluviana* (Audzijonyte & Väinölä, 2005) (Mysida: Mysidae) consumes detritus in the presence of *Daphnia* (Cladocera: Daphniidae). *Journal of Crustacean Biology*, 2020, 1-6. <https://doi.org/10.1093/jcbiol/ruaa053>

Smith, S.R., Amish, S.J., Bernatchez, L., Le Luyer, J., Wilson, C.C., Boeberitz, O., Luikart, G., Scribner, & K.T. 2020. Mapping of adaptive traits enabled by a high-density linkage map for Lake Trout. *G3: Genes, Genomes, Genetics* 10(6), 1929-1947. <https://doi.org/10.1534/g3.120.401184>

Stockwell, J. D., O'malley, B.P., Hansson, S., Chapina, R.J., Rudstam, L. G., & Weidel, B.C. 2020. Benthic Habitat is an integral part of freshwater *Mysis* ecology. *Freshwater Biology* 2020(00), 1-13 <https://doi.org/10.1111/fwb.13594>