

Angel Drobnica, Chair
North Pacific Fishery Management Council 1007 W. 3rd Avenue
Anchorage, AK 99501

Dear Ms. Drobnica,

I am pleased to recommend the appointment of Dr. Lee Cronin-Fine as a member of the Bering Sea and Aleutian Islands (BSAI) Crab Plan Team as Dr. Cody Szuwalski will step down from his Plan Team service in 2027.

Dr. Cronin-Fine is a Research Fishery Biologist at NOAA's Alaska Fisheries Science Center within the Status of Stocks and Multispecies Assessments Program. Dr. Cronin-Fine has led several stock assessments, including the BSAI Alaska Plaice, the BSAI Flathead Sole-Bering Flounder stock complex, the Gulf of Alaska (GOA) Flathead Sole, the GOA Skates stock complex, and the BSAI Octopus. All have been used to provide management advice.

Throughout Dr. Cronin-Fine's career, he has cultivated strong expertise that is directly applicable to crab stock management. His dissertation research focused heavily on improving size-structured population dynamics models used in crab fishery stock assessments. This included developing a new method for including individual variation in growth in size-transition matrices, writing a paper describing the best practices for creating a size-transition matrix, evaluating methods for modeling time-varying selectivity, and investigating key factors impacting a model's ability to estimate natural mortality. Currently, Dr. Cronin-Fine is researching the impacts of survey changes on assessment results by developing a spatially explicit age-structured population dynamics operating model to perform management strategy evaluations to evaluate survey changes in the Bering Sea.

Their educational background includes a Bachelor of Science in Applied Mathematics/Biology from Brown University, a Master of Science in Marine Biology from Northeastern University, and a Ph.D. in Quantitative Ecology and Resource Management from the University of Washington, where his doctoral research focused on size-structured models for fishery assessments. Dr. Cronin-Fine's extensive stock assessment experience, survey evaluation research and specialized knowledge of size-structured modeling make him a well-qualified candidate for contributing to the BSAI Crab Plan Team.

Sincerely,

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Ronald Felthoven, Director, REFM Division

Lee Cronin-Fine

Tel: (917) 880-9738 • Email: lcroninfine@gmail.com

Education

University of Washington, School of Aquatic and Fishery Sciences, 2014 – 2021 Seattle, WA

- PhD in Quantitative Ecology and Resource Management; Primary advisor is Andre Punt; Advanced mathematical course work including Analyzing Ecological Data, Stochastic Modeling of Scientific Data, and Linear Optimization; GPA 3.77.
- Research focused on advancing size-structured population dynamics modeling – the core methodology used in crab stock assessments. This included developing a new method for including individual variation in growth in size-transition matrices, determining best practices when dealing with natural mortality and time-varying selectivity. All studies used Bering Sea Tanner crab (*Chionoecetes bairdi*) biological and survey data to tune the simulation models.
- Acquired in-depth working knowledge of R, ADMB (Automatic Differential Model Builder) and Fortran
- Was responsible for organizing and running the NOAA-sponsored Think Tank, a semi-monthly interactive seminar series that focuses on fisheries-related topics.

Northeastern University, 2010 – 2012 Boston, MA

- Awarded Master of Science in Marine Biology; GPA 3.8.
- Graduated from Three Seas Program which focused on studying multiple aspects of marine biology including fish, coral reefs, and intertidal zones.
- Conducted a multivariate statistical research project to determine alewife stock structure using morphometrics.

Brown University, 2005 – 2009 Providence, RI

- Bachelor of Science in Applied Mathematics/Biology; GPA 3.0.
- Senior research study on bats' echolocation exploring the link between memory and echolocation by recording and processing data on flight patterns.

Experience

NOAA NMFS Alaska Fisheries Science Center, June 2023 – *Present: Research Fishery Biologist* Seattle, WA

- Part of the Status of Stocks and Multispecies Assessments Program.
- Lead author on several assessments including Alaska Plaice, Flathead, Skates and Octopus.
- Researching the impacts of survey changes on assessment results.

University of Washington, September 2021 – May 2023: *Post-Doctoral Scholar* Seattle, WA

- Working with the Alaska Fisheries Science Center as a NOAA affiliate researching the scientific and economic value of surveys conducted in the Bering Sea of Alaska.
- Developing a spatially explicit age-structured population dynamics operating model to perform a management strategy evaluation (MSE) to evaluate surveys.
- Primary programmer; coding in R and Rcpp.

Mezo Research Pty Ltd, October 2018 – March 2019: *Contractor* Melbourne, Australia

- Developed a size-structured population dynamics model for Victorian Fisheries Authority to be used by the rock lobster fishery in 2019.
- Primary programmer; coded in TMB (Template Model Builder).
- Programmed projection and simulation capabilities to evaluate potential harvest control rules for a crustacean fishery.

Saltwater Inc, August 2012 – May 2013: *Fisheries Observer* Anchorage, AK

- Served as a NOAA fisheries observer sampling fishermen's catch in the Bering Sea of Alaska.
- Collected biological data, including gender, length, and weight.
- Responsible for organizing, maintaining, and reporting collected data.

Gulf of Maine Research Institute, June 2011 - February 2012: *Research Assistant* Portland, ME

- Used multivariate statistical analysis to determine alewife stock structure.

- Performed ANOVA's, regressions, and multivariate statistical analyses using JMP.

Publications

- Cronin-Fine, L. and A. E. Punt, 2022. Factors influencing size-structured models' ability to estimate natural mortality. Fisheries Research, <https://doi.org/10.1016/j.fishres.2022.106292>
- Kapur, M. S., Siple, M. C., Olmos, M., Privitera-Johnson, K. M., Adams, G., Best, J., Castillo Jordan, C., Cronin-Fine, L., Havron, A. M., Lee, Q., Methot, R. D. and A. E. Punt, 2021. Equilibrium reference point calculations for the next generation of spatial assessments. Fisheries Research, <https://doi.org/10.1016/j.fishres.2021.106132>
- Cronin-Fine, L. and A. E. Punt, 2021. Modeling time-varying selectivity in size-structured assessment models. Fisheries Research, <https://doi.org/10.1016/j.fishres.2021.105927>
- Cronin-Fine, L. and A. E. Punt, 2020. There is No Best Method for Constructing Size-Transition Matrices for Size-Structured Stock Assessments. ICES Journal of Marine Science 77: 136 – 147.
- Akselrud, C. I. A., A. E. Punt, and L. Cronin-Fine, 2017. Exploring model structure uncertainty using a general stock assessment framework: The case of Pacific cod in the Eastern Bering Sea. Fisheries Research 193: 104-120.
- Punt A. E., C. A. Akselrud, and L. Cronin-Fine, 2017. The effects of applying mis-specified age- and size-structured models. Fisheries Research 188: 58 – 73.
- Cronin-Fine, L., J. D. Stockwell, Z. T. Whitener, E. M. Labbe, T. V. Willis and K. A. Wilson, 2013. Application of Morphometric Analysis to Identify Alewife Stock Structure in the Gulf of Maine. Marine and Coastal Fisheries: Dynamics, Management, and Ecosystem Science 5:11 – 20.

Presentations

- “Quantifying Scientific and Economic Value of Surveys to Fisheries Management” given at the National Stock Assessment Science Seminar on May 2, 2023
- “Things to consider when constructing size-transition matrices for size-structured stock assessments” given at the Quantfish workshop at UMass Dartmouth on February 13, 2023.
- “Quantifying the Scientific and Economic Value of Surveys to Fisheries Management” given at the University of Washington’s School of Aquatic and Fishery Sciences Think Tank on May 31, 2022.
- “Estimating Natural Mortality in Size-Structured Models” given at the National Stock Assessment Science Seminar Series on February 3, 2022.
- “Estimating Natural Mortality in Size-Structured Models” given at the Center of the Advancement of Population Assessment Methodology (CAPAM) workshop on natural mortality on June 15, 2021.
- “There is no best method for constructing size-transition matrices for size-structured models” given at the University of Washington’s School of Aquatic and Fishery Sciences Think Tank on February 18, 2020.
- “Comparing a Numerical Integration Method for Constructing Transition Matrix with Other Construction Methods” given at the 2019 Alaska Marine Science Symposium on January 30, 2019.
- “A numerical method for allowing individual variation in both growth parameters (k and L_{∞}) in size-structured models” given at the University of Washington’s School of Aquatic and Fishery Sciences Quantitative Seminar on November 9, 2017.
- “Modelling and accounting for different likelihood functions in relation to time-varying selectivity in size-structured models” given at the University of Washington’s School of Aquatic and Fishery Sciences Graduate Student Symposium on November 17, 2016.

Stock Assessments

- Cronin-Fine, L., 2026. Assessment of the Alaska Plaice Stock in the Bering Sea and Aleutian Islands. North Pacific Fishery Management Council, Anchorage, AK. Available from <https://www.npfmc.org/library/safe-reports/>
- Cronin-Fine, L., 2026. Assessment of the Flathead Sole-Bering Flounder Stock Complex in the Bering Sea and Aleutian Islands. North Pacific Fishery Management Council, Anchorage, AK. Available from <https://www.npfmc.org/library/safe-reports/>
- Cronin-Fine, L., 2026. Assessment of the Flathead Sole Stock in the Gulf of Alaska. North Pacific Fishery Management Council, Anchorage, AK. Available from <https://www.npfmc.org/library/safe-reports/>
- Cronin-Fine, L., 2026. Assessment of the Skates Stock Complex in the Gulf of Alaska. North Pacific Fishery Management Council, Anchorage, AK. Available from <https://www.npfmc.org/library/safe-reports/>
- Cronin-Fine, L., 2024. Assessment of the Alaska Plaice Stock in the Bering Sea and Aleutian Islands. North Pacific Fishery Management Council, Anchorage, AK. Available from <https://www.npfmc.org/library/safe-reports/>

- Kapur, M.S., Cronin-Fine, L. 2024. Assessment of the flathead sole-Bering flounder stock complex in the Bering Sea and Aleutian Islands. North Pacific Fishery Management Council, Anchorage, AK. Available from <https://www.npfmc.org/library/safe-reports/>
- Cronin-Fine, L., 2023. Assessment of the Skates Stock Complex in the Gulf of Alaska. North Pacific Fishery Management Council, Anchorage, AK. Available from <https://www.npfmc.org/library/safe-reports/>
- Cronin-Fine, L., 2023. Harvest Projection of the Alaska Plaice Stock in the Bering Sea and Aleutian Islands. North Pacific Fishery Management Council, Anchorage, AK. Available from <https://www.npfmc.org/library/safe-reports/>
- Cronin-Fine, L., Williams, B. C., Lowe, S and Aydin, K., 2023. Assessment of the Octopus Stock in the Bering Sea and Aleutian Islands. North Pacific Fishery Management Council, Anchorage, AK. Available from <https://www.npfmc.org/library/safe-reports/>
- Sampson, D. B., O. S. Hamel, K. Bosley, J. Budrick, L. Cronin-Fine, L. K. Hillier, K. E. Hinton, M. J. Krigbaum, S. Miller, K. M. Privitera-Johnson, K. Ramey, B. T. Rodomsky, L. K. Solinger, and A. D. Whitman. 2017. 2017 Assessment Update for the US West Coast Stock of Arrowtooth Flounder. Pacific Fishery Management Council, Portland, OR.
- Wetzell, C.R., L. Cronin-Fine, and K. F. Johnson. 2017. Status of Pacific Ocean perch (*Sebastes alutus*) along the US west coast in 2017. Pacific Fishery Management Council, 7700 Ambassador Place NE, Suite 200, Portland, OR 97220.

Journals I have Peer Reviewed for

- Fisheries Research
- Marine and Coastal Fisheries
- Journal of Fish Biology
- Canadian Journal of Fisheries and Aquatic Sciences