

A Framework to Evaluate Potential Risks to Listed Species from Per- and Polyfluoroalkyl Substances

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Background/Objectives. The key technical objectives of this research are to: (1) identify T&E species that occur on PFAS contaminated sites, and (2) develop a tiered framework to assess exposure and risk to T&E species from PFASs in the environment. Our approach involves a thorough investigation of the available data on T&E species occurrence, life-histories, and habitat requirements to identify the likelihood and routes of potential PFAS exposure and an investigation of available toxicity data and prioritized needs for T&E species assessment. Objective 2 builds on the outcomes of Objective 1 in which we compile available toxicity data and use deterministic and probabilistic exposure models to estimate PFAS exposure and potential sensitivity to T&E species.

Approach/Activities. Our technical approach is divided into four tasks that build upon each other, with the goal to synthesize all data into an operational conceptual framework for assessing PFAS risks to T&E species.

Objective 1: Co-occurrence of PFAS contamination and T&E species on contaminated sites and potential toxicity of PFASs to T&E species.

- Task 1: Identification of sites that are or may be contaminated with PFASs resulting from the historical use of Aqueous Film Forming Foam (AFFF) in fire suppression activities.
- Task 2: Determine Locations, Occurrences, and Exposure of Rare, Threatened or Endangered Species on sites identified in Task 1. Geographic Information System (GIS) geodatabase data layers and taxa specific exposure models are used to assess potential PFAS exposure to T&E species.
- *Objective 2: Develop tiered assessment approach for T&E species risk assessments.*
- Task 3: Identify and/or derive toxicity benchmarks (e.g., Toxicity Reference Values) for use in understanding and estimating potential effects of PFASs exposure to T&E species found in Task 2.
- Task 4: Synthesize Outcomes from Tasks 1-3 into an overall conceptual framework for assessing risk to listed species that inhabit PFAS-contaminated sites.

Results/Lessons Learned. Preliminary results indicate mapping of T&E species habitat and home-range can be developed using US Fish and Wildlife IPaC and the primary literature. We have incorporated a range of uncertainty with home-range data in effort to provide more realistic exposure potential scenarios and not worst-case. Critical habitat layers are overlaid on reported areas of AFFF use in GIS, allowing exposure potential to be quantified. Challenges associated with this approach have been developing an understanding of the fate and transport of PFAS from the sites of AFFF use (i.e. how far from the site of release has contamination spread).