**Supplementary Material**

**Fish Ticket Data Processing**

For total fleet-wide (observed + unobserved) bycatch estimation, the landed amount of each species or species group is the only proxy effort metric measured for the entire fleet. Thus, the retained landing information from sales receipts (known as fish tickets) is crucial for fleet-wide total bycatch estimation for the commercial groundfish fisheries on the U.S. west coast. Fish tickets are trip-aggregated sales receipts for market categories that may represent single or multiple species. Fish ticket landing receipts are completed by buyers in each port for each delivery of fish by a vessel. Fish tickets are issued to buyers by a state agency and must be returned to the issuing agency for processing. Fish tickets are designed by the individual states (Washington, Oregon, and California) with slightly different formats by state. In addition, each state conducts species-composition sampling at the ports for numerous market categories that are reported on fish tickets. Fish ticket and species-composition data are submitted by state agencies to the PacFIN regional database.

Annual fish ticket landings data, with the states’ species composition sampling applied, were retrieved from the PacFIN database and subsequently divided into various fleets of the groundfish fishery. Observer and fish ticket data processing steps are described in detail in Appendix B of the annual groundfish mortality report (Somers et al. 2022). All data processing steps specific to this report are described in the bycatch estimation methods in the main text.