

THE GIRNOCK AND BADDOCH FISH TRAPS ON DEESIDE



Background

The Girnock and Baddoch are two long-term monitoring sites for spring Atlantic salmon populations. Both are located in the upper Aberdeenshire Dee. The Girnock Burn is Scotland's longest running comprehensive study of salmon populations (adults, emigrants and juveniles), operating since 1966. The Baddoch Burn fish trap has been operating since 1988.

The sites include pairs of up and downstream traps, monitoring adult and emigrant numbers, ages, and sizes respectively. Electrofishing in the catchments provides additional information on juvenile densities, ages and sizes.

How is the information used?

Data on adult returns provide an important catch-independent indicator of the status of spring salmon stocks. In addition, information on return rates (the proportion of emigrants returning as

adults) provides information on the combined effects of fisheries and marine mortality.

Taken together, adult and emigrant data allow construction of stock-recruitment (S-R) relationships, from which the number of fish (or eggs) required to maintain the population can be determined. The resulting targets can be used to assess the status of these and other rivers (by transfer). Data are also provided to ICES (International Council for the Exploration of the Sea) where they inform national and international assessments of stock status.

Adult returns and population status

The status of salmon populations in the Girnock and Baddoch is shown in Figure 1. Any years where returning female numbers are below the lower dashed line are not likely to maintain maximum emigrant production.

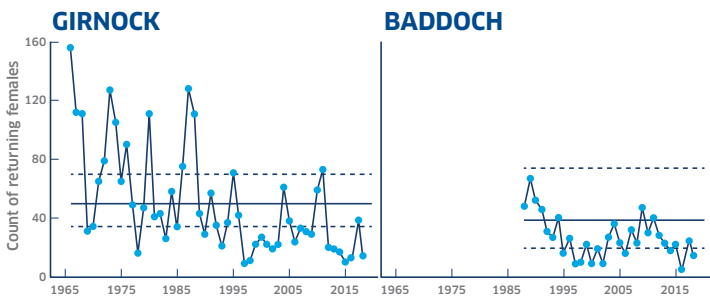


FIGURE 1. COUNTS OF FEMALE ATLANTIC SALMON RETURNING TO THE TRAPS. SOLID LINES REPRESENT THE NUMBER OF FEMALES REQUIRED TO MAXIMISE PRODUCTION OF EMIGRANTS. DASHED LINES ARE 95% CONFIDENCE INTERVALS.

Juvenile salmon

Juvenile salmon typically spend two to three years in the Girnock and Baddoch streams before migrating out to sea. There are two distinct periods of downstream migration; spring and autumn.

Both the age composition and timing of migration have changed over time, potentially in response to changing fish densities and river temperature.

The percentage of two year old emigrants at the Girnock is greater than at the Baddoch, consistent with its lower altitude. Both sites showed an increasing trend in the percentage of two year old migrants until ca. 2003, followed by a decline thereafter (Fig. 2). A very low percentage of two year old migrants was observed at the Girnock in 2015 as the result of very strong and weak three and two year old age classes.

Further information

www.gov.scot/Topics/marine/Salmon-Trout/Coarse/Freshwater/Monitoring/Traps

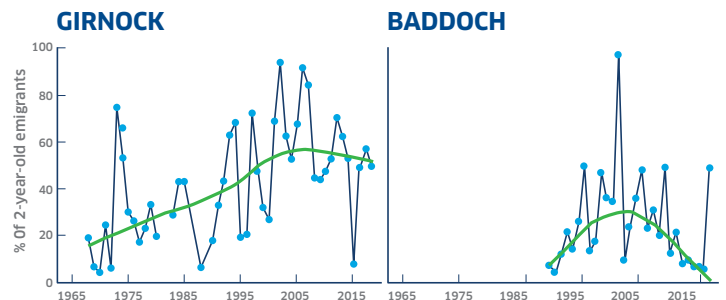


FIGURE 2. PERCENTAGE OF TWO-YEAR-OLD JUVENILE SALMON EMIGRATING FROM THE TRAPS. GREEN LINES ARE SMOOTHED TEMPORAL TRENDS.

Adult return rate

Adult return rates vary substantially between years. However, there is an overall downward trend at the Girnock despite major reductions in fisheries mortality (Fig. 3).

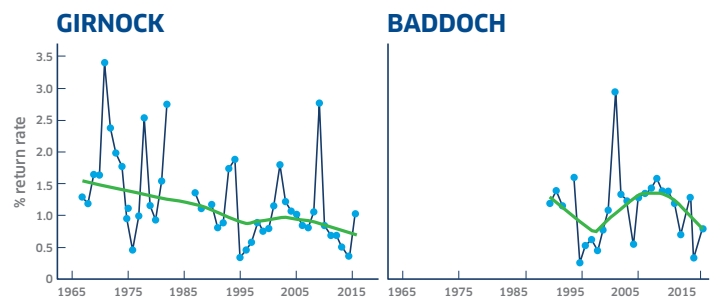


FIGURE 3. PERCENTAGE OF JUVENILE EMIGRANT SALMON RETURNING TO THE GIRNOCK AND BADDPOCH TRAPS AS ADULT FEMALES. GREEN LINES ARE SMOOTHED TEMPORAL TRENDS.

Inter-Disciplinary Research

The Girnock and Baddoch catchments are also the focus of important collaborative research on topics such as hydrology, hydrochemistry, stream temperature, salmon population dynamics, and the effects of stocking. Collaborators include the Universities of Aberdeen, Strathclyde and Birmingham.