



McDonald Lake, located on the Southeast Alaska mainland 65 km north of Ketchikan (Figure 1), supports the largest sockeye salmon run in Southern Southeast Alaska. McDonald Lake sockeye salmon are harvested in mixed-stock commercial net fisheries in the Northern Boundary area of Alaska and Canada (Geiger et al. 2004). Escapements have been estimated from calibrated foot survey counts conducted on the spawning grounds since 1980 (Eggers et al. 2009). A lake-fertilization project was conducted at McDonald Lake for 23 years, from 1982 to 2004. The sockeye salmon run was strong over most of that enhancement period—escapements averaged more than 100,000 fish in the 1980s and 1990s, sockeye salmon were harvested in terminal purse seine fisheries when runs were forecasted to be in excess of the escapement goal, and the personal use harvest averaged 6,000 fish (Figure 2). McDonald Lake sockeye salmon were also used as a brood source for enhancement projects at five other sites in Southern Southeast Alaska. The sockeye salmon escapement goals over most of this period were a BEG of 65,000 to 85,000 (1993–2005) and an SEG of 70,000 to 100,000 (2006–2008; Figure 3).

The McDonald Lake run has undergone an extended downturn in recruitment over the past decade; however, despite nutrient enhancement, estimated escapements have fallen below escapement goals in six of seven years between 2002 and 2008 (Figure 3). Rearing fry populations also reached their lowest levels during that period (Eggers et al. 2009). The department implemented a series of management actions in the closest mixed-stock commercial net fisheries in Sumner and Clarence straits in 2007 and 2008 to allow more sockeye salmon to escape to McDonald Lake (Bergmann et al. 2009). The fishery restrictions were based on coded-wire-tagging studies in the 1980s, which showed this stock was harvested primarily in the District 6 drift gillnet fishery, with the peak weeks of harvest from mid July to early August; the next largest portions of the run were harvested in the district 1, 2, and 4 purse seine fisheries.

In 2009, the McDonald Lake escapement goal was changed to an SEG of 55,000 to 120,000 sockeye salmon based on a stock-recruit analysis (Eggers et al. 2009). The new goal was considered a SEG, rather than a BEG due to uncertainty regarding the effects of lake fertilization on stock productivity, since essentially all adult returns in the stock-recruit time series experienced nutrient enhancement during the lake residence portion of their life history. Because McDonald Lake sockeye salmon escapements still did not meet the new SEG in four of five years from 2004 to 2008 (Figure 3), the stock was recommended as a stock of management concern in 2009.

### ***Regulatory History***

Management actions taken in 2007 and 2008 were incorporated into a formal action plan (Bergmann et al. 2009) that was approved by the board in 2009 and carried out through 2011. Management actions included time restrictions in the District 6 drift gillnet fishery and area closures in the purse seine fisheries in Sumner and upper Clarence straits during a three-week period from mid-July to early August (statistical weeks 29–31; Table 1; Figure 1). In addition, terminal purse seine fisheries have not been conducted since 2001, and bag limits in the McDonald Lake personal use fishery have been gradually reduced from a daily limit of 50 fish per person in 2002 to an annual limit of 20 fish per person from 2007 to the present.

From 2007 to 2009, the department conducted a genetic stock identification project to estimate the proportions of McDonald Lake sockeye salmon in the fisheries affected by the action plan and to determine if the timing of management restrictions was appropriate. Results from that project

showed that McDonald Lake sockeye salmon accounted for a large portion of the sockeye salmon harvest during the action plan weeks in the District 6 drift gillnet fishery and the districts 1 and 7 purse seine fisheries (e.g., 20% or more of the sockeye salmon harvest during many weeks of the action plan), and that fisheries actions were generally well timed. The results of this sampling project will be published by the ADF&G Gene Conservation Laboratory.

### ***Updated Status and Stock of Concern Recommendation***

The McDonald Lake sockeye salmon run has improved over the past three years, and the SEG has been met for two consecutive years, 2010 and 2011. The 2009 escapement of 51,000 sockeye salmon was just shy of the lower bound of the escapement goal (55,000–120,000). The 2010 escapement of 72,500 fell within the escapement goal range, and the preliminary escapement estimate for 2011 is a minimum of 113,000 sockeye salmon (as of September 12, 2011; Figure 3). In addition, the fall fry population resulting from the 2009 escapement (800,000) was twice the average fall fry population from 2005 to 2009 (400,000). As a result of improved runs, the escapement goal team recommends removing the stock of concern designation for the McDonald Lake sockeye salmon run.

### **REFERENCES CITED**

- Bergmann, W. R., S. N. Forbes, S. C. Heintz, B. L. Meredith, A. W. Piston, and S. B. Walker. 2009. McDonald Lake sockeye salmon action plan, 2009. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report Series No. 1J09-03, Douglas.
- Eggers, D. M., S. C. Heintz, and A. W. Piston. 2009. McDonald Lake sockeye salmon stock status and escapement goal recommendations, 2008. Alaska Department of Fish and Game, Fishery Data Series No. 09-31, Anchorage.
- Geiger, H. J., M. A. Cartwright, J. H. Clark, J. Conitz, S. C. Heintz, K. Jensen, B. Lewis, A. J. McGregor, R. Riffe, G. Woods, and T. P. Zadina. 2004. Sockeye salmon stock status and escapement goals in Southeast Alaska [in] Stock Status and Escapement Goals for Salmon Stocks in Southeast Alaska. H. J. Geiger and S. McPherson, editors. Alaska Department of Fish and Game, Divisions of Sport and Commercial Fisheries, Special Publication 04-02.

Table 1.—Commercial fisheries management restrictions outlined in the McDonald Lake Action Plan and implemented through 2011.

Area	Gear	Period <sup>a</sup>	Year implemented	Restriction
District 6	Drift gillnet	Statistical weeks 29–31	2007–2011	Open for a maximum of two days.
District 1	Purse seine	Statistical weeks 29–31	2007–2011	Western shore of Gravina Island (in subdistrict 101-29) closed north of the latitude of Cone Point.
District 2	Purse seine	Statistical weeks 29–32	2009–2011	Western shore of the Cleveland Peninsula (subdistrict 102-80) closed within 3 nautical miles of the shoreline.
District 5	Purse seine	Statistical weeks 29–31	2009–2011	Northwest corner of Prince of Wales Island (in subdistrict 105-41) closed between Point Baker and the Barrier Islands.
District 6	Purse seine	Statistical weeks 29–31	2009–2011	West side of Etolin Island closed between Point Stanhope and the latitude of Round Point, and east side of Prince of Wales Island closed between Luck Point and Narrow Point (subdistrict 106-30).
District 7	Purse seine	Statistical weeks 29–31	2009–2011	Section 7-B closed (subdistrict 107-10). If pink salmon runs are extremely strong, the northern portion of section 7-B, north of Union Point may be open during statistical week 31. If this occurs, restrictions may occur in that area south of Union Point into statistical week 32 to reduce the overall interception of sockeye salmon

<sup>a</sup> Statistical weeks 29–31 are approximately mid July to early August.

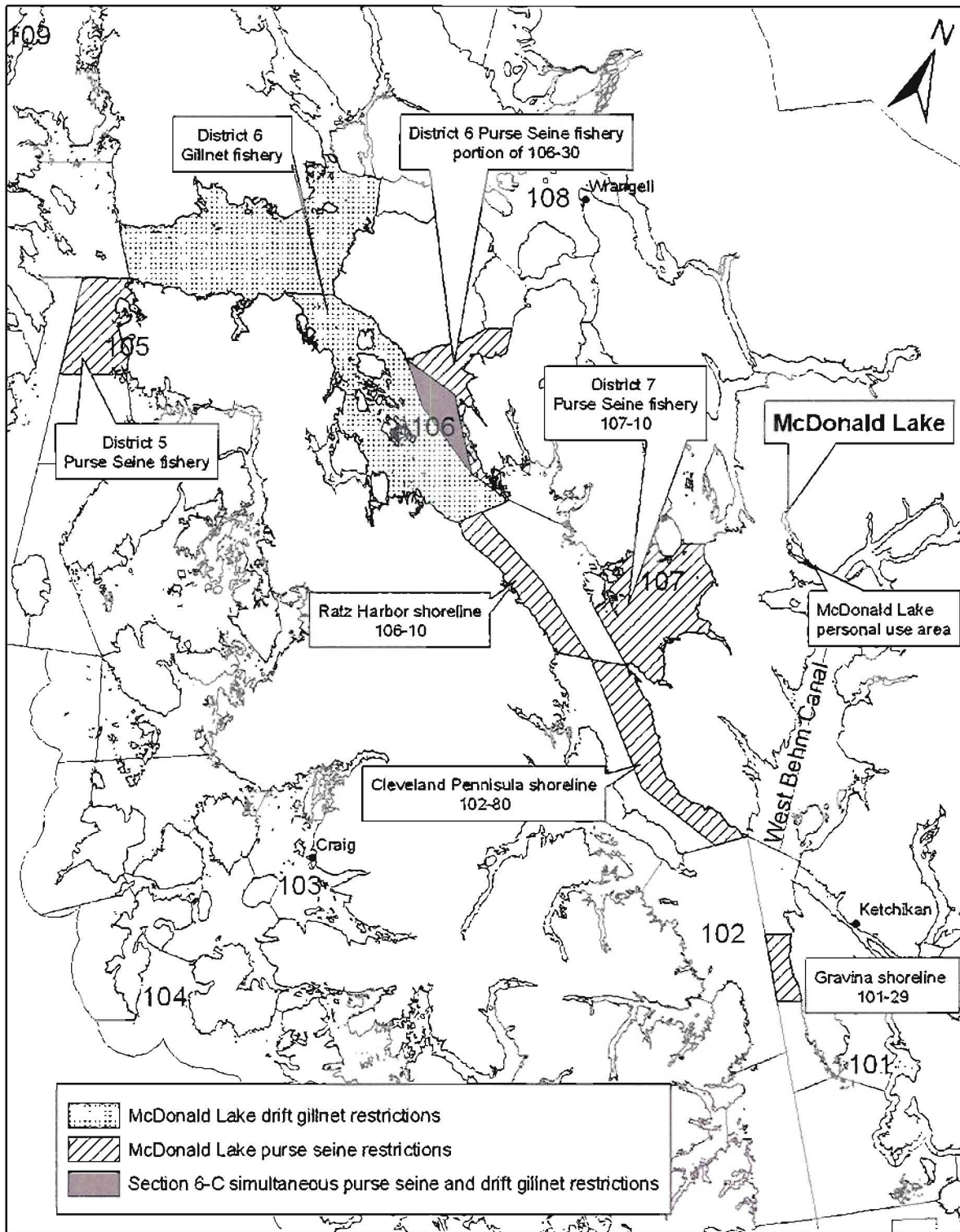


Figure 1.—Commercial fishing districts in Southern Southeast Alaska, and areas in districts 1 through 7 delineated for time and area restrictions in the McDonald Lake Action Plan. (See Table 1.)

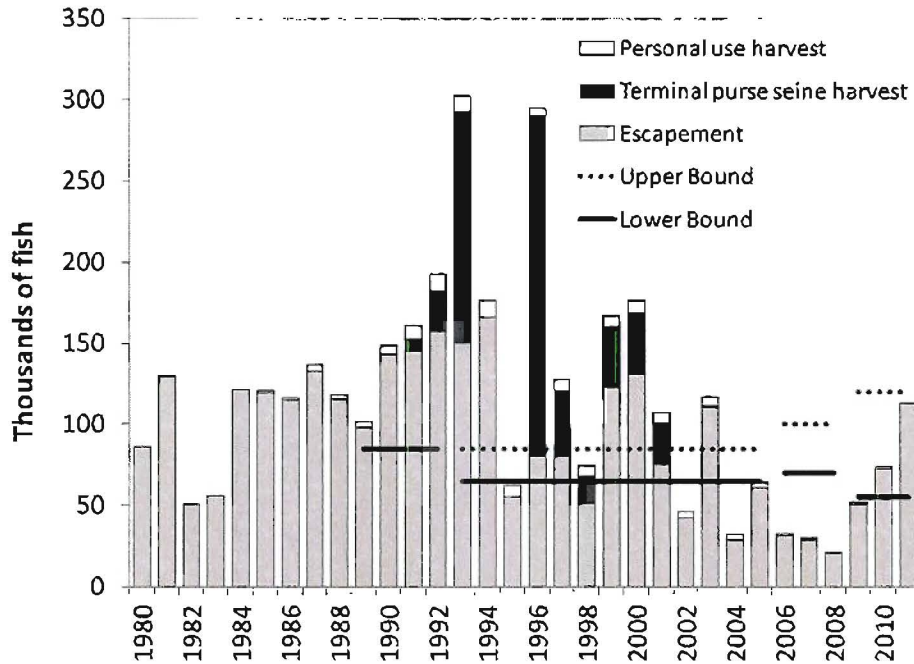


Figure 2.—McDonald Lake sockeye salmon escapements (expanded foot surveys), terminal purse seine harvest, personal use harvest, and escapement goals, 1980–2011.

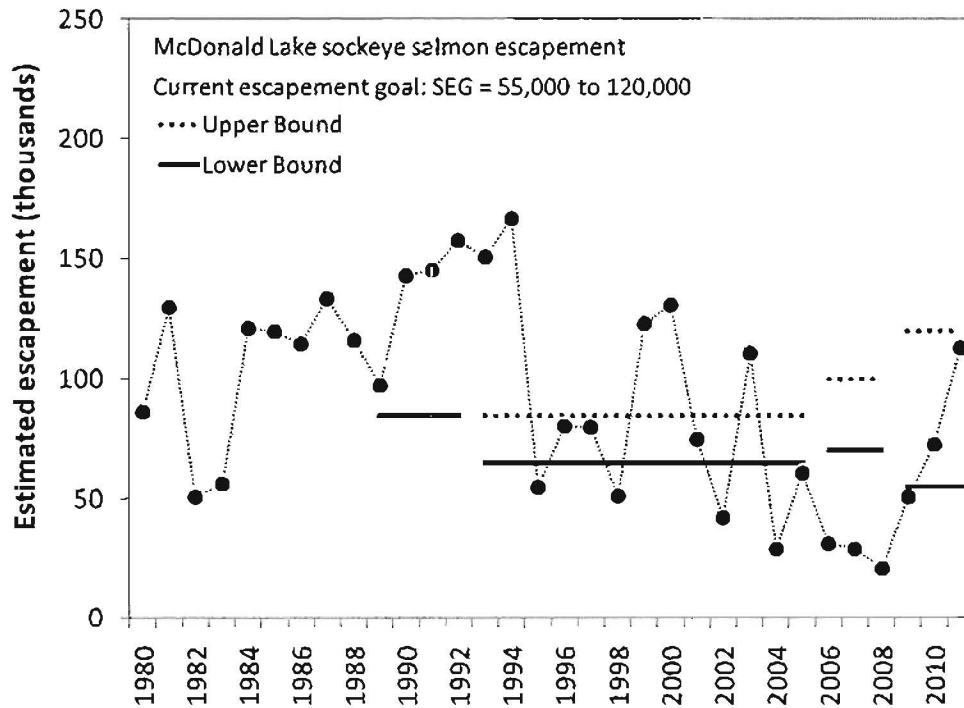


Figure 3.—McDonald Lake sockeye salmon escapements (expanded foot surveys) and escapement goals, 1980–2011. The current escapement goal is a sustainable escapement goal (SEG) range of 55,000–120,000 sockeye salmon.