



Fig. 8. Air view of John R., Alaska, at Departure Bar. Note boats at water's edge, left center in photo. Width of river at boats 120 ft.

a one-week river trip at time of low flow, September 1966. The gaging station record for the Koyukuk River at Hughes is included.

The bankfull condition of the gaging station is approximated by the discharge of 1.5 year interval. Figure 7 is a plot of Q_{bkf} and Q_{ave} vs drainage area. It can be seen that the river trip estimates fit consistently with Koyukuk gaging station record.

Estimates of average annual flow of an unmeasured river such as the John River could

be made from consideration of all the gaging station records of north-central Alaska. The river trip data, however, add certain information that is not available even from gaging station records. For example, the downstream rate of change of particle size is large (exponent $- .48$) and of roughness about average ($y = -.17$). For the latter, Langbein's theoretical value (in Leopold, Wolman, Miller, 1964, p. 271) is $y = -0.22$.

The concavity of the profile of the John

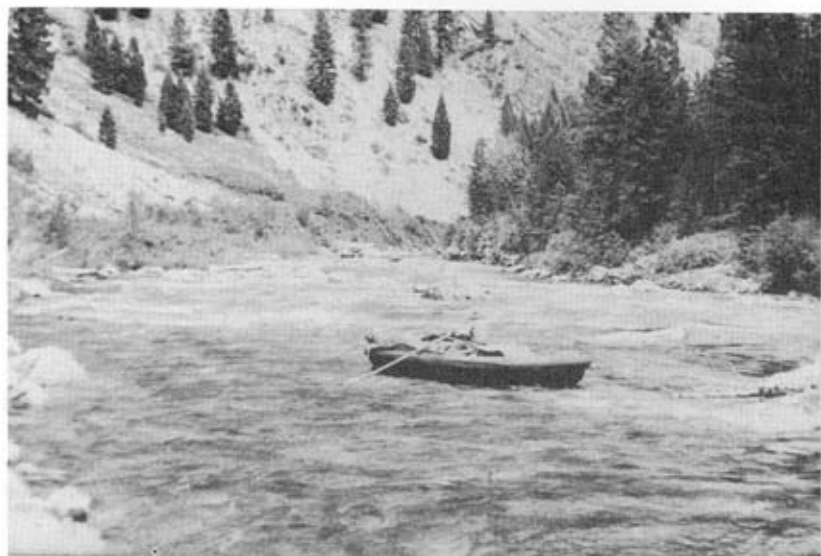


Fig. 9. A typical view of Middle Fork Salmon R., Idaho.