

the fall.

Seining will consist of repeated hauls of a 4.6 meters wide x 1.8 meters deep x 3.2 mm mesh seine until depletion (the number of fish captured in a haul is 10% or less of the highest seine catch for that sample site). Samples will be taken from preferred Virgin spinedace microhabitats approximately 10 meters in length. In areas where seining is not feasible, electrofishing methods will be incorporated. These repetitive techniques will primarily provide that the population in a given habitat has been thoroughly sampled. It secondarily provides depletion information for population estimates.

All native fish will be identified to species, counted, measured, and returned to site of capture. All non-indigenous fish will be identified to species, counted, measured and returned to site of capture.

In addition to the sampling described above, Virgin spinedace population information will be obtained from data acquired in the bi-annual sampling by the Virgin River Recovery Team.

Data obtained on responses of populations and habitat to management actions from the monitoring process will be assessed and evaluated annually by the Virgin spinedace conservation team. The effectiveness of the management actions will be measured using empirical criteria to be established for this Strategy.

Develop Mitigation Plan and Protocols for Future Activities

A mitigation plan and protocols for mitigating future activities will be developed during 1995. Any new water depletion or habitat alteration of baseline conditions of historic habitat will require prior evaluation, assessment, and approval. Mitigation will be determined based on an evaluation of how baseline conditions would be altered. During 1995, methodologies for conducting this evaluation will be developed. The evaluation will incorporate procedures for determining flow requirements by integrating components of the conceptual framework outlined by Hill et al. (1991).

Descriptions of existing flow patterns will probably include details on the timing, duration, magnitude, slope, and frequency of high-flow events in selected streams along with analyses to determine an average annual hydrograph for timing and slopes of rising and falling limbs. The HEC-2 analysis (U.S. Army Corps of Engineers 1982) may be used to estimate bankfull flows. A frequency-of-occurrence curve may be required to describe the return period for peak flows. A flow duration curve may also be required to describe the flow duration associated with specific exceedence values.