

Mapping Procedures

General

Mapping of the study area was accomplished using remote sensing techniques. Remote sensing technologies provide the most accurate, cost effective and expeditious means for mapping large areas. Standard photo interpretation, cartography and digitization procedures were followed to produce final maps and digital data. All habitats (wetland and riparian) as well as land use and land cover were mapped. This mapping effort provides baseline spatial data for habitat and land use planning and management by identifying location and size of all habitats. Data exist as both hard copy maps and in digital format for ease of analysis using geographical information systems (GIS).

Photography

Photography was flown specifically for this project to provide the optimum scale, emulsion and time of season for accuracy in habitat discrimination. River flows were monitored prior to photo acquisition and photography was acquired on August 25 and 26, 1999 at a scale of 1:24,000 and is stereoscopic with a color infrared emulsion (Figure 2). Discharge at the time of photography was 3440 and 3330 cfs (cubic feet per second) respectively. This flow rate allowed more accurate identification of the main channel compared to river bars that are submerged during high flows. It also allows for more accurate differentiation of upland and riparian versus wetland since there is no flooding at low flow which can obscure the true habitat or land use.

Field Work

Field reconnaissance was conducted both prior to and during photo interpretation to correlate photographic signatures to distinct habitats and landscape features on the ground. Two field trips were conducted, one preliminary trip the week of October 5, 1998 and another more intensive trip the week of May 7, 2000. Wetland and riparian habitats were identified in the field by hydrology, vegetation and soil types. Upland land use and land cover were identified by vegetation and human usage. Sites were checked on all quads within the study area to establish and confirm correlation of photo-signatures to specific cover types. U.S. Fish and Wildlife Service staff conducted field work in concert with the U. S. Army Corps of Engineers, Natural Resource Conservation Service, Montana Department of Natural Resources and Conservation, Montana Department of Environmental Quality, Montana Governors Upper Yellowstone River Task Force and the University of Montana.