

**Erik Schnaderbeck**  
Senior Division Animal Sciences  
*Identifying Individual Rainbow Trout Utilizing Distinct Spot Orientation*

It is well documented that external marking devices and tags negatively affect fish and wildlife. I studied Rainbow trout *Oncorhynchus mykiss* to determine if spotting patterns were unique and if a technique could be developed to identify individual fish. I located 8 unique areas on rainbow trout that consistently had spotting patterns and could be easily observed and counted. I recorded spots from 8 distinct locations (parameters) on 282 harvested rainbow trout caught by ice-fishermen at Antero Reservoir. The 8 parameters used in the study were: Maxillary, Gill Plate, Pectoral Fin, Pelvic Fin, Lateral Line, Tail Below, Adipose Edge, and Adipose Inside. Data was collected from fishermen on Antero Reservoir (10 miles west of Hartsel, CO) during the period 12/27/2009 through 02/06/2010. Statistical analysis was conducted to obtain range, mean, standard deviation, and histograms for each parameter. Histograms indicated that each parameter generated normal population distribution bell curves. No duplicate identifications occurred in the sample of 282 fish. Ranges of values for each parameter were used to project a possible 20,958,013,440 identification combinations. To further test the applicability of this technique I screened the data and determined a new range for each parameter using only frequently occurring values clustered near the mean of each parameter. I used a standard deviation of one (68% of values clustered closest to the mean) to obtain a revised projection of 2,475,964 possible identification combinations. This revised value indicates that this technique has little risk of producing duplicate identifications making this identification technique a valuable tool for fishery biologists.