1968

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Field Testing of Radio Telemetry From Fish

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Project Number 152

The general area of research activity followed was that of radio-frequency telemetry from free-swimming trout. Tracking studies and the securing of EKG waveform were the two specific projects undertaken.

During the first six weeks of the summer, efforts were devoted entirely to improving the devices previously developed at Wyoming for transmitting radio-frequency energy from beneath the surface of fresh water. A much improved circuit was designed for tracking purposes which has more than twice the lifetime of any previous version. Also the bulk and weight of the EKG units were reduced substantially without a sacrifice of performance. Twelve radio-frequency tags were constructed as well as four EKG units.

The devices fabricated in the laboratories on campus were then field-tested in various trout waters in the neighborhood of the Biological Research Station at Moran, Wyoming. Over a period of four weeks, radio tags were attached to different species of trout in different types of habitat and the feasibility of tracking investigated. In general, the results were highly encouraging. Several rather unexpected behavior patterns of fish were observed and an exceptionally reliable performance of the tags experienced.

The EKG units were tested under field conditions where they supplied here-to-fore unavailable data on heart rate of unfettered fish. It was discovered that cutthroat trout have a resting heart rate as low as 36 ppm during the hours of darkness and a rate of as high as 58 ppm during periods of feeding activity.

A contact was made with the biologists working in the area of pesticide research at the Federal Fish Hatchery at Jackson. The damaging effects of very minute concentrations of pesticides on fish heart action was observed and recordings were made of EKG waveforms in pesticide laden waters. Hopefully, research sponsored by Federal funds will develop from these activities.

While much work remains to be done in improving apparatus and field techniques, enough was accomplished during the past summer to furnish guidelines for work during the coming year and to generate topics for graduate student research for several years. The results of the summer's work are being summarized and will be submitted as soon as possible to the appropriate journal for possible publication.

Supported by the University of Wyoming Graduate School Summer Fellowship.