

Hatchery managers in Tennessee can be faced with nitrogen supersaturation and low dissolved oxygen concentrations in their water sources. We designed a dual-mode inexpensive device to efficiently absorb oxygen into fishery source water (to promote fish health) while simultaneously stripping nitrogen (N₂) (a significant cause of fish mortality). Most currently available devices are designed specifically for only one of these operations. We built it using principles of engineering mass transfer and designed it specifically for the needs of Buffalo Springs Fish Hatchery in East Tennessee. Although field tests have not been completed, initial results indicate that the diffuser achieves both nitrogen stripping and very happy Rainbow Trout *Oncorhynchus mykiss* using substantially less oxygen inputs than previous models, it is light and easy to handle, and can be made inexpensively. Our goal to provide hatchery operators with guidance to optimize device performance under varying conditions, and evaluate its utility in a broader range of field conditions. We are especially interested in evaluating performance in situations where oxygenation must be achieved with atmospheric oxygen only and no liquid or concentrated oxygen is available.