Abstract: Barriers to fish movement have long been part of fisheries management and the control of invasive fishes in particular. Various barrier types have been developed, mostly with mixed success. Non-Physical behavioral barriers, ones that rely on sensory stimuli to modify fish behavior, have gained interest in recent years. One such barrier, that we are investigating are bubble curtains, which generate distinct hydrodynamic and acoustic fields that may be exploited to deter passage of invasive fish species. This technology is particularly useful at sites where other barrier technologies are either too expensive or do not function. In this study, the invasive common carp, Cyprinus carpio L., was used as a model species to test the efficacy of the bubble curtain to inhibit movement, because this species, like many other ostariophysians, has a well developed sense of hearing. Behavioral laboratory trials revealed a 72% and 80% reduction in the number of times common carp crossed the bubble curtain in up- and down-stream directions, respectively. Sound appeared to be the dominant stimulus for common carp, as complementary acoustic measurements showed that a simple bubble curtain generated a sound field with a maximum sound pressure level of 120-130dB (re 1µPa) at 150Hz, well above the carp hearing minimum threshold. Based on the behavioral laboratory trials, a full scale bubble curtain prototype is being developed for installation in the field. The bubble curtain’s potential role as an effective watershed management tool will be discussed in comparison to other barrier technologies will be discussed.