

Electrofishing Recommendations for Sampling Larval Pacific Lampreys
(from: Moser et al. 2007; and G. Silver and C. Luzier, USFWS, personal communication)

- a. Most surveys rely on a backpack or shore-based electrofishers in small streams, most effective in waters less than 0.8 m in depth.
- b. Generally three types of electrofishers are suitable for ammocoete sampling: 1) AbP-2 "Wisconsin" electrofisher (ETS Electrofishing, Verona, WI); 2) Smith-Root LR-24 model electrofisher with lamprey settings; and 3) conventional electrofisher traditionally used for salmonids.
- c. Electrofishers used for ammocoete sampling should be set with two wave forms, a lower frequency "tickle" wave form to coax ammocoetes out of the substrate and a higher frequency "stun" wave form to immobilize ammocoetes for netting.
- d. Effective sampling involves this 2-stage method:
 - i. First stage: use 125V direct current with a 25 percent duty cycle applied at a slow rate of 3 pulses per second, to induce ammocoetes to emerge from the sediment.
 - ii. Use a pattern of 3 slow pulses followed by a skipped pulse (burst pulse) helps ammocoetes to emerge.
 - iii. Second stage: immediately after ammocoetes emerge, use a fast pulse setting of 30 pulses per second to immobilize and net them.

	Bursted Slow Pulse Primary Wave Form	Standard Fast Pulse Secondary Wave Form
Voltage	125 v	125 v
Pulse Frequency	3 Hz	30 Hz
Duty Cycle	25%	25%
Burst Pulse Train	3:1	X

- e. A conventional electrofisher can be used but the 2-stage settings/method described above should be used. Conventional electrofishing gear set for salmonid capture uses higher voltage and frequencies which potentially causes electronarcosis of buried ammocoetes, resulting failure to emerge and therefore a recording of false absence. Additionally, a conventional electrofisher has only one switch making the transition from slow (tickle) to fast (stun) pulse pattern more difficult as the switch needs to be released and pressed again. This technique can be learned with practice.
- f. Avoid exposing ammocoetes to extended periods of electrofishing as it has also been linked to electronarcosis.
- g. Use dip nets to capture ammocoetes where they are readily visible. Where not visible, seines may be effective.
- h. Capture efficiencies may vary according to site characteristics, electrofishing gear used and electrofishing techniques.
- i. Within each reach, electrofishing should be conducted in a downstream to upstream direction (for the purpose of reducing turbidity/maintaining visibility) with one person operating the electrofisher and at least one person netting ammocoetes. Each reach should be thoroughly and slowly sampled, with more effort directed at suitable lamprey rearing habitat and less effort in areas with hard substrates or high water velocity.
- j. Using the 2-stage method described above, the electrofisher should mainly be operated in the lower frequency output mode to irritate ammocoetes out of the substrate. When necessary, the higher frequency mode should be activated for capturing emergent ammocoetes.
- k. Multiple electrofishing passes should be made to ensure a more complete removal of ammocoetes. A fifteen minute break between passes should be taken to reduce the chance of electronarcosis.

Thompson, K., Brostrom, J. K., Wang Luzier, C. 2010. Best Management Practices to Minimize Adverse Effects to Pacific Lamprey (*Entosphenus tridentatus*). USDA Forest Service, USDI Fish and Wildlife Service, USDI Bureau of Land Management. 25 pp.
 (<https://www.fws.gov/pacificlamprey/Documents/Best%20Management%20Practices%20for%20Pacific%20Lamprey%20April%202010%20Version.pdf>)