



Preliminary assessment of common carp population in West Vadnais Lake

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Abundance, biomass and length/size structure

Boat electrofishing is often used as a rapid assessment method for carp populations because observed catch rate (carp/hour) can be used to relatively quickly and accurately estimate the abundance and biomass of carp (Bajer and Sorensen 2012). We have recently expanded the relationship between CPUE and biomass/abundance published by Bajer and Sorensen (2012) by including data from several additional lakes, which makes the relationship more robust.

Typically, several electrofishing surveys (each on a separate day) are conducted to estimate mean catch rate, abundance and biomass. To gain a preliminary insight into carp abundance and biomass in West Vadnais Lake, we conducted one electrofishing survey in the summer of 2017. We surveyed the lake for several hours (1 hour of pedal time) and captured 38 carp. The lengths of captured carp ranged from 420mm up to 610 mm (Figure 1). Mean length was 482 mm and mean weight was 1.6 kg.

The relatively high catch rate (38/h) suggested that carp abundance was 160 per hectare ($N = 13,000$ carp in the lake) and biomass was **248 kg/ha**. This is approximately 2.5 times higher than the management threshold for shallow lakes (100 kg/ha). While these assessments are preliminary, it is clear that West Vadnais had a high abundance of carp.

We aged a sub-sample of ten carp and those individuals were 2 and 3 years old. This suggests a strong recruitment event in the lake in 2014 and 2015.

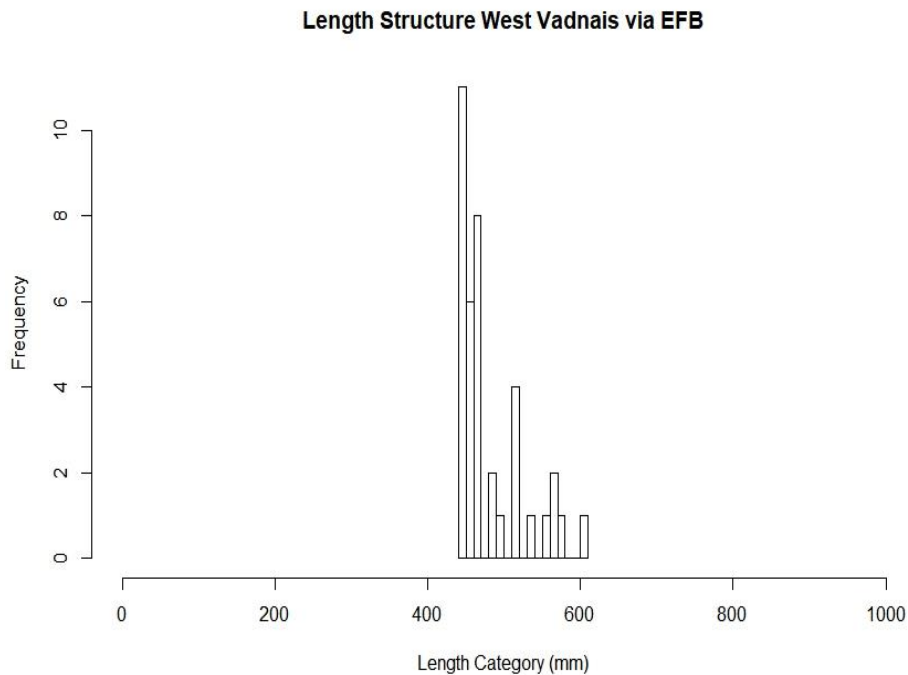


Figure 1. Length frequencies of carp captured during electrofishing surveys within West Vadnais during 2017 (EFB=Electrofishing)

Discussion

Although our assessments have been preliminary, it appears that West Vadnais Lake was inhabited by a dense population of young carp. The biomass is exceeding the management threshold by 2.5 times. Anecdotally, the water clarity was very poor in the lake at the time we conducted the surveys.

The carp were young (2 and 3 years old). It is unknown if those young carp moved into West Vadnais from an adjacent nursery or were spawned within the lake. We suspect that the latter hypothesis is more plausible because West Vadnais likely winterkills every few years (carp often recruit in marshes that winterkill).

Carp tend to grow quickly in the first years of life. This preliminary survey and ageing results show that there the majority of the population is still young and the population likely to grow rapidly in the next 1-2 years. For reference, if the average length of carp increased by 50 mm (482 up to 532 mm), that could increase the lake’s carp biomass from ~248 kg/ha up to around 310 kg/ha and if it increases 100 mm the biomass could be near 400 kg/ha, around four times the management threshold. That is assuming low mortality rates and low out migration from the lake. In general, if something is not done to remove carp in the near future, the negative impact of carp in West Vadnais would increase substantially.

We recommend that a comprehensive carp biomass estimate be done to confirm these results. We typically recommend surveying the lake with an

electrofishing boat on three different days, or conducting mark-recapture estimates, which are less prone to bias. We also recommend further assessment on West Vadnais' role in promoting recruitment into Owasso Lake by monitoring the movement of young carp between the two systems.

References:

Bajer, P. G. and P. W. Sorensen (2012). "Using Boat Electrofishing to Estimate the Abundance of Invasive Common Carp in Small Midwestern Lakes." North American Journal of Fisheries Management **32**(5): 817-822.

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