

Lampricide Application Rates

These equations are used to calculate lampricide application rates during sea lamprey treatments. The initial application rates are based on pretreatment data. Initial rates are adjusted after measurement of concentrations of lampricides in the stream. When lampricides are applied into an existing lampricide block, measurements are made both upstream and downstream of the maintenance application. When Bayluscide is added to a lampricide block, concentrations of both lampricides are measured and both application rates adjusted. Stream discharge may be back-calculated from lampricide application rates and used in further calculations of lampricide application rates.

Initial TFM Application Rates

Canada:

$$\text{rate (mL/min)} = (\text{discharge (cms)} \times \text{mg/L} \times 16.67) / \text{Km}^* \quad [1]$$

$$*\text{Km} = (\text{TFM specific gravity (gm/mL)} \times \% \text{ A I} / 100) / 3.6 \quad [2]$$

United States:

$$\text{rate (mL/min)} = \text{discharge (cfs)} \times \text{mg/L desired} \times 4.4^{**} \quad [3]$$

$$** 4.4, \text{ varies slightly with percent active ingredient} \quad [4]$$

Adjusted TFM Application Rate

$$\text{New application rate (mL/min)} = \frac{(\text{current rate})(\text{desired mg/L TFM})}{\text{current mg/L TFM}} \quad [5]$$

Maintenance TFM Application Rate (Boost of Primary Block)

If discharge is known:

$$\text{rate (mL/min)} = (\text{cfs})(\text{mg/L desired downstream} - \text{mg/L measured upstream})(4.4) \quad [6]$$

If discharge is unknown:
rate (mL/min) = $\frac{(\text{initial rate})(\text{mg/L to be added})}{(\text{mg/L measured downstream} - \text{mg/L measured upstream of boost})}$ [7]

Supplemental TFM Application to Standing Waters

Canada:
volume of TFM (mL) = area (ha-m) x mg/L desired x 25,000 [7]

United States:
volume of TFM (mL) = $\frac{\text{volume (ft}^3\text{) x desired ppm x 4.35}}{60}$ [8]

Stream Discharge Calculations

Canada:
discharge (cms) = (application rate (mL/min) x mg/L x 16.67)/ Km [9]

United States:
discharge (cfs) = application rate (mL/min)/ (mg/L x 4.4) [10]

Bayluscide Application Rates

Bayluscide application rates (EC and WP) are calculated with computer spreadsheets. Bayluscide (EC and WP) is always applied in conjunction with TFM, at a maximum of 2% by weight of TFM (active ingredient).

Bayluscide 70% Wettable Powder

On basis of ug/L active ingredient desired:
Application rate of slurry mix (mL/min) = $\frac{(\text{cfs} \times 0.0017 \times \text{desired ug/L A.I.})}{\text{slurry conc. (g/mL A.I.)}}$ [11]

e.g. For slurry of 1.0 lb/10.0 gal: slurry conc. = .0074 g /mL A.I.

On basis of percent of TFM concentration:
Bayluscide rate (mL/min) = $\frac{(\text{lb Bayluscide/min}) \times (378,500 \text{ mL/lb total Bayluscide})}{0.615}$ [12]

lb Bayluscide/min = TFM application rate (lb/min A.I.) x percent applied (i.e. 0.01) [13]

Bayluscide 20% Emulsifiable Concentrate

On basis of µg/L active ingredient desired:

Canada:

Bayluscide application rate (mL/min) = (cms)(0.35)(desired µg/L A.I.).

United States:

Bayluscide application rate (mL/min) = (cfs)(.010)(desired µg/L A.I.)

Bayluscide 3.2% Granular

On basis of active ingredient/unit area:

Canada:

Application rate = 175 kg/ha

United States:

Application rate = 156 lbs/acre

Abbreviations

A.I.	=	active ingredient
cfs	=	cubic feet per second
cms	=	cubic meters per second
gal	=	gallon
gm	=	gram
ha	=	hectare
L	=	liter
lb	=	pound
m	=	meter

mg	=	milligram
min	=	minute
mL	=	milliliter
ug	=	microgram