

POTENTIAL NO NET LOSS INDICATORS

| Indicator (all in shoreline jurisdiction) | Functions affected - key categories - water quality, water quantity and habitat | Type of Impairment** | Limitations of indicator | Is data available or reasonable to obtain |
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| Loss of forest cover: <u>Acres</u> converted from forest land to other land uses. | Water quality-sediment, phosphorus & toxic filtration and retention; temperature regulation. Water quantity-flow regulation. Habitat-structure for habitat life needs; input of organics & LWM*. | Reduces forest buffers and decreases filtering of pollutants from surface & subsurface flow. Alters the delivery and timing of water to aquatic areas, increasing quantity of water and pollutants delivered to aquatic habitats, which affects habitat structure. Increases flow. Loss of nesting sites, rearing, refuge & foraging areas. | Useful only in rural areas. Doesn't identify future land use. Difficult to determine acres in shoreline jurisdiction. | Details of application available from DNR and local government. Class IV forest practice applications. CCAP data. |
| Shoreline stabilization: <u>Linear length</u> of bulkheads, revetments, bioengineering, seawalls, groins, retaining walls, gabions. (Includes decrease in length, change to soft structure.) | Habitat-Riparian and aquatic habitat, sediment supply. Input of organics & LWM. Structure for habitat life needs. | Interrupts habitat forming processes, such as beaches & channel migration. Loss of nesting sites, rearing, refuge & foraging areas. | Combines different types of stabilization measures into one general category; impacts may vary. | Is data available from local government, including permits & SDP exempt projects? Can locals track over time? Use HPA-only projects? |
| Marine & freshwater riparian vegetation. <u>Linear measurement</u> of mature native riparian vegetation of a given width (buffer width) or <u>percent cover</u> of different vegetation classes. | Water quality-sediment, phosphorus & toxic filtration and retention, temperature regulation. Water quantity-flow regulation. Habitat-input of organics & LWM, Structure for habitat life needs. | Removes capacity of riparian vegetation to filter surface flows, sediment, phosphorus and toxics; subsurface removal of nitrogen, pathogens. Increases overland and substream flows. Loss of LWM that provides instream structure. Loss of nesting sites, rearing, refuge & foraging areas. | No permit, so no record of change. Focused project needed to track. Useful only if a baseline exists. Methodology needs to be able to measure change. May be difficult to measure over short time frame. | Can locals measure and track? Use sample areas, aerial photos, LIDAR. |

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| <p><u>Acres</u> of permanently protected areas, with no/limited development: public ownership, current use/PBRS, conservation easements, fee ownerships, NGOs.</p> | <p>Water quality-sediment, phosphorus & toxic filtration and retention; temperature regulation. Water quantity-flow regulation. Habitat- Riparian and aquatic habitat, sediment supply. Input of organics & LWM. Structure for habitat life needs.</p> | <p>Loss of nesting sites, rearing, refuge & foraging areas.</p> | <p>How measure degree of protection? Limit to protected areas with no development? Difficult to connect with specific functions.</p> | <p>Need info on ownership, PBRS, easements. Other info available from county auditor and assessor? Land trusts.</p> |
| <p>Piers/docks/floats, overwater structures: <u>Square footage</u> of new and replacement. Or track grating, piling, construction materials.</p> | <p>Habitat Water quality-toxics</p> | <p>Increase in predation, reduction in light and aquatic vegetation and simplification of food web.</p> | <p>All docks not same - i.e. grating, materials vary. New docks partially mitigate impacts.</p> | <p>Is data available from local government, including permits and SDP exempt projects? Can locals track over time? Use HPA data? Use DNR data - number of and area over water.</p> |
| <p>Road lengths (<u>feet</u>) within 200 feet of water body</p> | <p>Water quantity Water quality Habitat- connectivity</p> | <p>Intercepts and changes timing of flows to aquatic habitat. Increases sediment and toxics.</p> | <p>Is there much new road development in shoreline jurisdiction?</p> | <p>Who permits and has data?</p> |
| <p><u>Number</u> of road crossings of water bodies (bridges, culverts)</p> | <p>Habitat - Instream functions Water quality</p> | <p>Simplifies stream habitat structure, increases channel confinement and interrupts habitat forming processes. Increases delivery of pollutants.</p> | <p>Is there much new road development in shoreline jurisdiction? Distinguishing between fish friendly crossings and others. Combining broad range of activities.</p> | <p>Who permits and has data?</p> |
| <p>Water quality: 303(d) <u>list</u> All water quality parameters such as temperature, dissolved oxygen, fecal coliform, heavy metals, toxic organics Shellfish listings <u>closures</u></p> | <p>Water quality</p> | <p>Impairment is specific to type of listed 303(d) issue (e.g. increased temperature, low dissolved oxygen, increased fecal coliform, heavy metals and toxic organics.</p> | <p>How relate to functions? Some impacts from outside shoreline jurisdiction .Only impaired waters are listed & measured; no WQ improvement project in place. No criteria to remove from list. Sampling methodology change, Not always comparable. Marine & fresh water lists updated in alternating 2-year cycles. Some impacts from outside shoreline jurisdiction and municipality. Emergency closures updated regularly. Uneven data. Changes may be too frequent for</p> | <p>Accessible data from Ecology. Is water body on or off list? 303(d) - comprehensive, Dept of Health Shellfish Program.</p> |

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| | | | NNL purposes. Limited to fecal coliform. Reflects impacts on human health, not shellfish health. | |
| Levees/dikes: <u>Linear feet</u> | Water quality -sediment removal, temperature. Water quantity-water storage, flooding. Habitat-structure for habitat life needs. | Impairs natural flooding regime. Reduces floodplain sediment retention, denitrification and hyporheic functions. Decreases groundwater storage and base flows. Interferes with formation of habitat structure such as distributary channels in tidal and riparian and in-channel and off-channel habitat in freshwater settings. Removes habitat structure for nesting, rearing, refuge and foraging. | Can change in habitat quality of levee be easily measured? Various types of levees & dikes are lumped together; impacts may vary. | Measure increase/decrease in lineal feet, quality of levee related to riparian vegetation & slope. Data from locals or FEMA? |
| Floodplain area: <u>Acres</u> allowed to flood -tidal and river (lack of flood control and lack of other structures such as houses). | Water quality - removal of toxics, sediment, phosphorous and pathogens through adsorption, filtration and retention. Removal of nitrogen through denitrification. temperature regulation; Water quantity - water storage and flow regulation and reduction in downstream flooding Habitat - formation of habitat structure from LWM, vegetation communities and sediment type/channel configuration that support habitat life needs. Input of organics. | Impairment similar to that for levees & dikes with loss of floodplain from diking & filling. | Availability of data, maintenance of data. | Do local governments measure this for shoreline inventory? FEMA floodplain info available. |

* LWM - Large Woody Material

** For some indicators, decreasing the length or area of the indicator would result in a benefit to shoreline functions (e.g., shoreline stabilization, piers & docks.) For other indicators, increasing the length or area of the indicator would result in a benefit to functions (e.g. forest cover, riparian vegetation.)