

TABLE 3.3B
 PHYSICAL AND HYDROLOGICAL INDICATORS
 COST COMPARISON

INDICATOR/ BASIS FOR COST	IMPLEMENTATION COST	NOTES
<p>(7) <i>Stream Widening/Downcutting</i></p> <ul style="list-style-type: none"> • Per reach cost • Reach defined as approximately 2000', 10 measurements per reach • Two staff members required per site • Stream cross-sections measured with taped surveys, not traditional field survey equipment • Field cross-sections established and recorded with flagged steel reinforcing bar • Includes overhead expenses (supplies, vehicles, travel, utilities, maintenance, rent, printing, and equipment) • Includes data analysis and preparation of summary report 	<p>\$575 to \$700 per 2000 foot reach</p>	<p>Cost is based on surveying first and second order headwater streams, in semi-humid to humid climates. For start-up add: steel reinforcing bars, flagging, hip chain, 50' tape, wading rod, notebooks, clinometer, and computer(s).</p>
<p>(8) <i>Physical Habitat Quality</i></p> <ul style="list-style-type: none"> • Per reach cost • Reach defined as approximately 275' (75 meters), 10 observations per reach. • Quantitative assessments of natural habitat structures (such as fallen trees, large rocks, etc.), channel alterations, recently deposited sediments, riffle/pool sequences, and length of erosional areas. • Qualitative assessment of presence of trash and debris, and stream character (morphology, dominate substrate, etc.). • Substrate composition measured at 3 stations per reach using modified Wolman pebble count. Percent embeddedness, wetted width, bank height, gradient, and canopy coverage measured at all stations. • Two staff members required per site • Includes overhead expenses (supplies, vehicles, travel, utilities, maintenance, rent, printing, and equipment) • Includes data analysis and preparation of summary report 	<p>\$400 to \$490 per 275 foot reach</p>	<p>Cost is based on a series of discrete measurements using quantitative and semi-quantitative descriptive parameters. For start-up costs add: 50' tape (or walktax), clinometer, notebooks, and computer(s).</p>

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<p>(9) Impacted Dry Weather Flows</p> <ul style="list-style-type: none"> • Per study cost • Study cost assumes long term (≥ 10 years) stream flow gaging data is available • Study involves comparing data from one or more gaging station(s) undergoing changed land use with gaging station data from an unchanged (control) area. • Includes overhead expenses (supplies, vehicles, travel, utilities, maintenance, rent, printing, and equipment) • Includes data analysis and preparation of summary report 	<p>\$4,500 to \$5,500 per study area</p>	<p>Based on long term data (≥ 10 years) availability. For start-up costs add: Long term stream flow monitoring data and computer(s). Study area assumed to include data from five stations or less.</p>
<p>(10) Increased Flooding Frequency</p> <ul style="list-style-type: none"> • Per study cost • Study cost assumes long term (≥ 10 years) stream flow gaging data is available • Study involves comparing data from one or more gaging station(s) undergoing changed land use with gaging station data from an unchanged (control) area. • Includes overhead expenses (supplies, vehicles, travel, utilities, maintenance, rent, printing, and equipment) • Includes data analysis and preparation of summary report 	<p>\$4,500 to \$5,500 per study area</p>	<p>Based on long term data (≥ 10 years) availability. For start-up costs add: Long term stream flow monitoring data and computer(s). Study area assumed to include data from five stations or less.</p>
<p>(11) Stream Temperature Monitoring</p> <ul style="list-style-type: none"> • Per monitoring station cost, per year • Cost includes automated samplers, recording temperature hourly, requiring downloading every six months • Automated samplers are downloaded in office (laboratory), not at site • Analysis of data includes computing daily mean, maximum and minimum temperature • Includes overhead expenses (supplies, vehicles, travel, utilities, maintenance, rent, printing, and equipment) 	<p>\$400 to \$500 per station per year</p>	<p>Based on yearly monitoring costs, temperature meters deployed once, data downloaded twice per year. Data is automatically downloaded into a desktop computer, additional data analysis required to compute daily mean, maximum and minimum temperatures.</p>