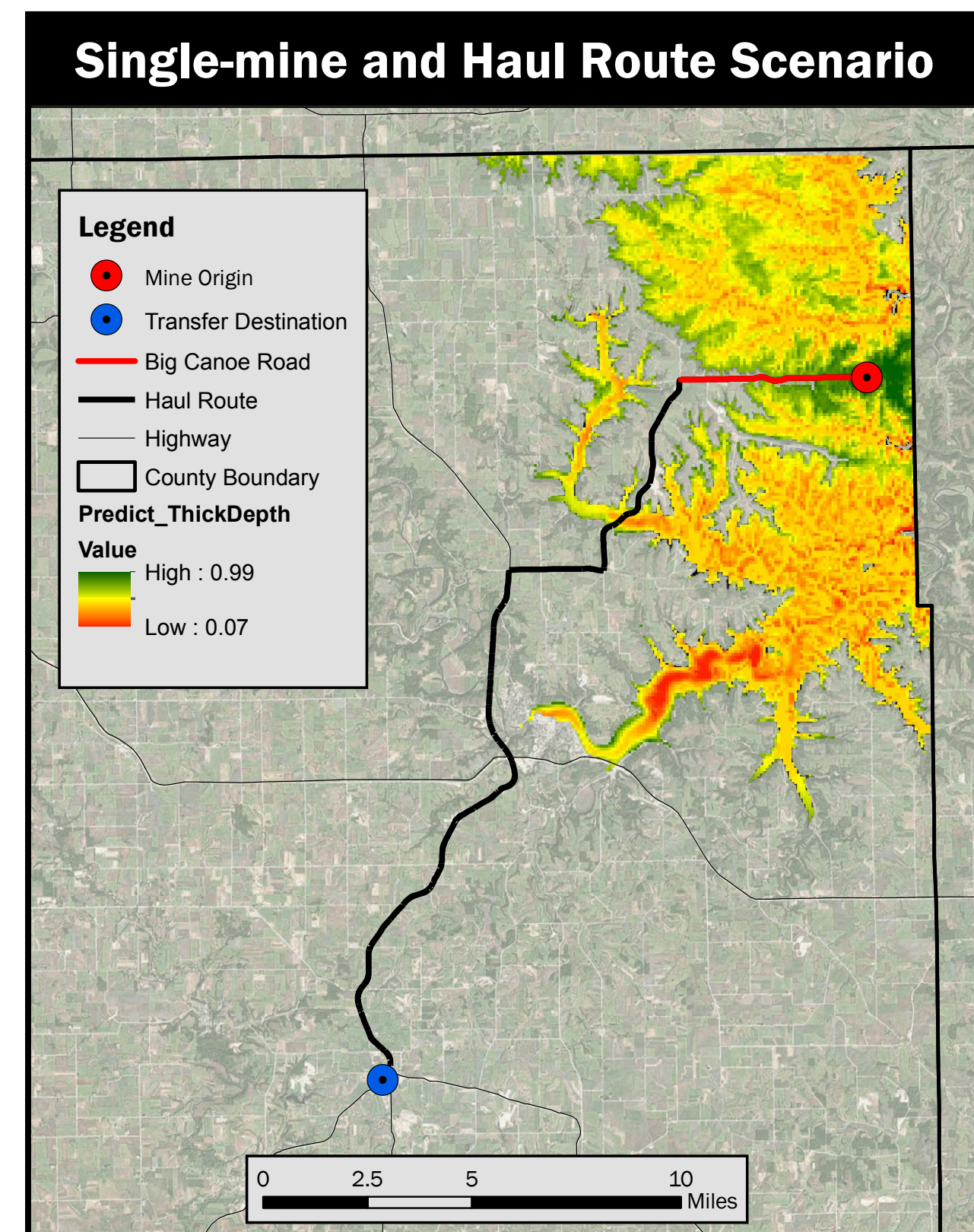


Valuing Potential Impacts for One Hypothetical Mine in Winneshiek County

Mitchell Brouse, Della Caldwell, Raymond Heitner, and David Sweeney

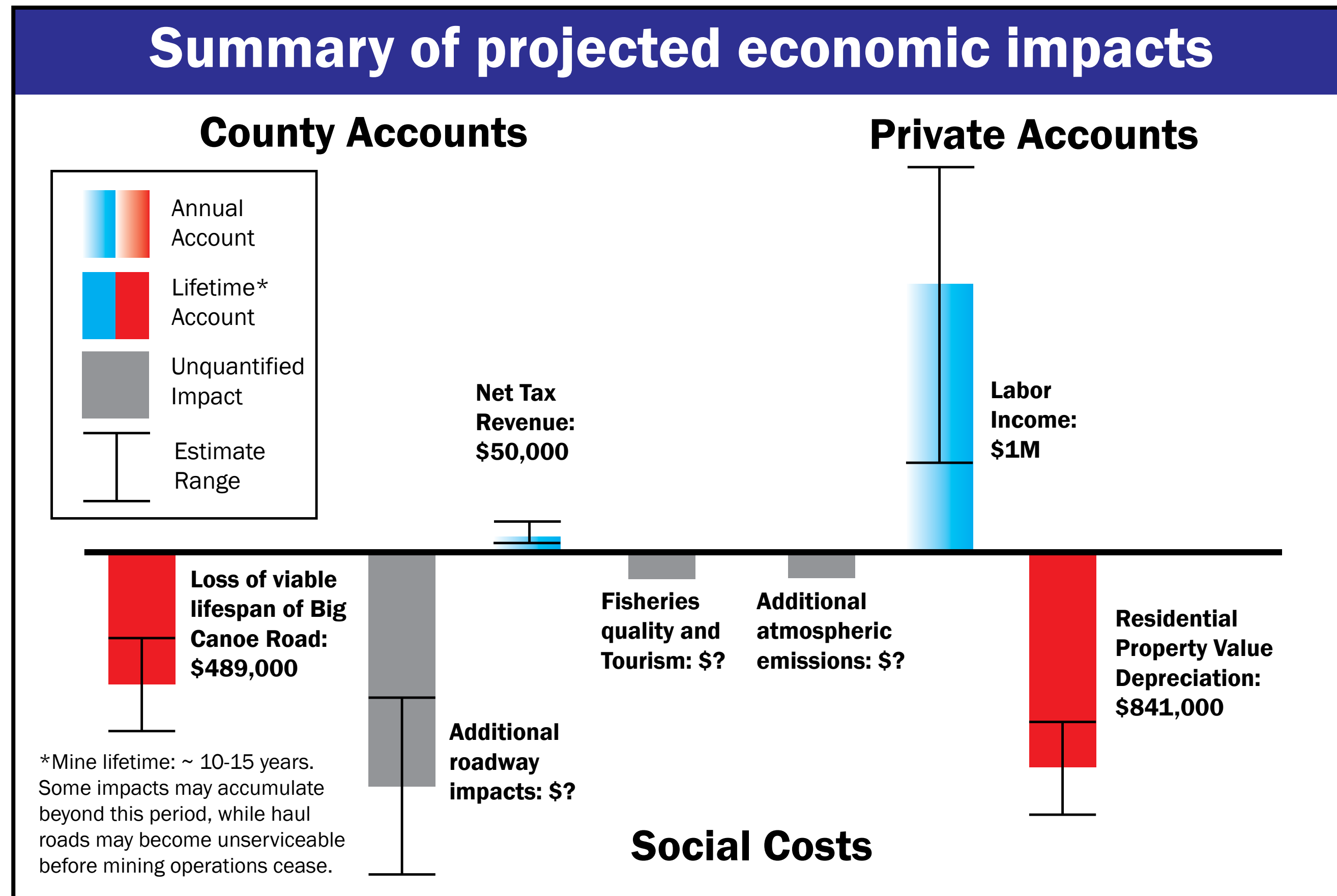
Project Overview

This poster highlights key findings from *Frac-Sand Mining in Winneshiek County: A Comprehensive Impact Study*. The goal of that study was to quantify direct and spillover effects associated with a regional mining scenario, and to provide the County and its citizenry the necessary context for policy making. This poster makes an important distinction between those benefits and costs that accrue to the County, and those which affect private individuals. These public and private accounts cannot be reconciled. Likewise, annual accounts and accounts which accumulate over the lifetime of mining activity were not aggregated.



Mining assumptions

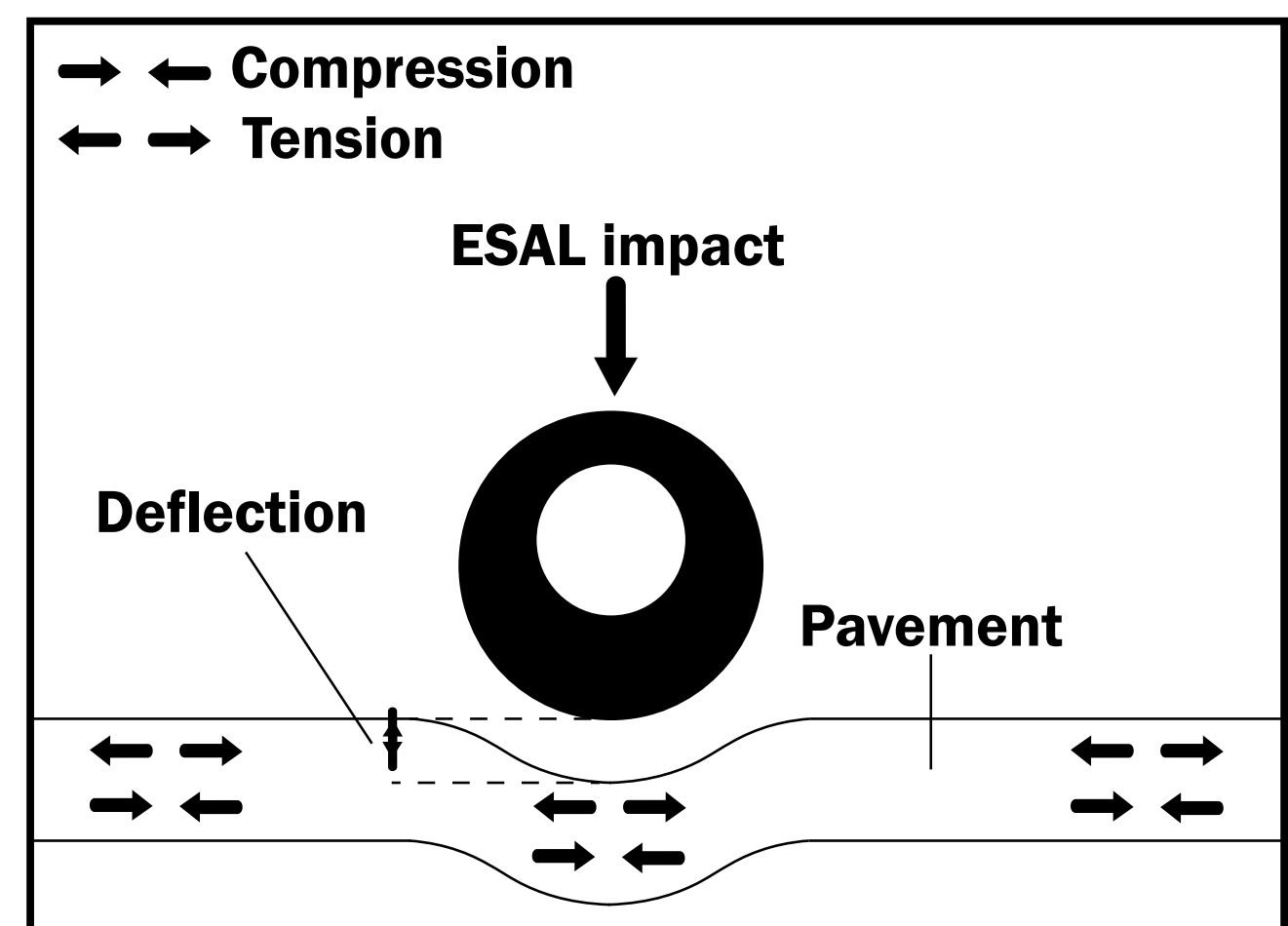
A single-mine scenario allows us to contextualize mining impacts. Although more than one mining facility could operate in the county, this poster adopts our primary scenario for a single mine and haul route. The scenario is a direct outgrowth of statistical and geological modeling performed by GEEMaP researchers. All County, private, and social impacts are derived from the assumption of a 200-acre, medium-intensity mine located in the county's northeast corner. To estimate greatest potential impact, the scenario assumes a haul route that is completely enclosed within the county, terminating at the rail hub in Calmar.



County Accounts: Cost to Road Infrastructure



Above: The current condition of Big Canoe Road.



Life of Big Canoe Road: -\$489K

The scenario mine generates between 10,770-35,551 annual truck trips, which vary over a range of operational intensities. To calculate this range of impacts, annual truck volumes and tonnages were converted to a standard unit of measure, the Equivalent Axle Single Load. This statistic captures the relationship between total truck weight and axle distribution. Additional ESALs generated by mining activity were compared against the design lifetime ESALs for which Big Canoe Road was engineered. These new ESALs are projected to consume between 37%-65% of the remaining lifetime of Big Canoe Road. Although we have not applied the model to all local roads along our haul route, we anticipate that impacts would be just as significant for those roadways. For one hypothetical mine, the total cost to road infrastructure may be 2-3 times greater than the \$489,000 figure.

Equivalent Single Axle Load Comparison Chart			
Vehicle	Weight, lbs	Axle Count	ESALs
Car	4,000	2	0.0004
School Bus	6,000	2	0.0022
Mixer Truck	68,000	4	2.575
Semi Rig	80,000	5	2.349

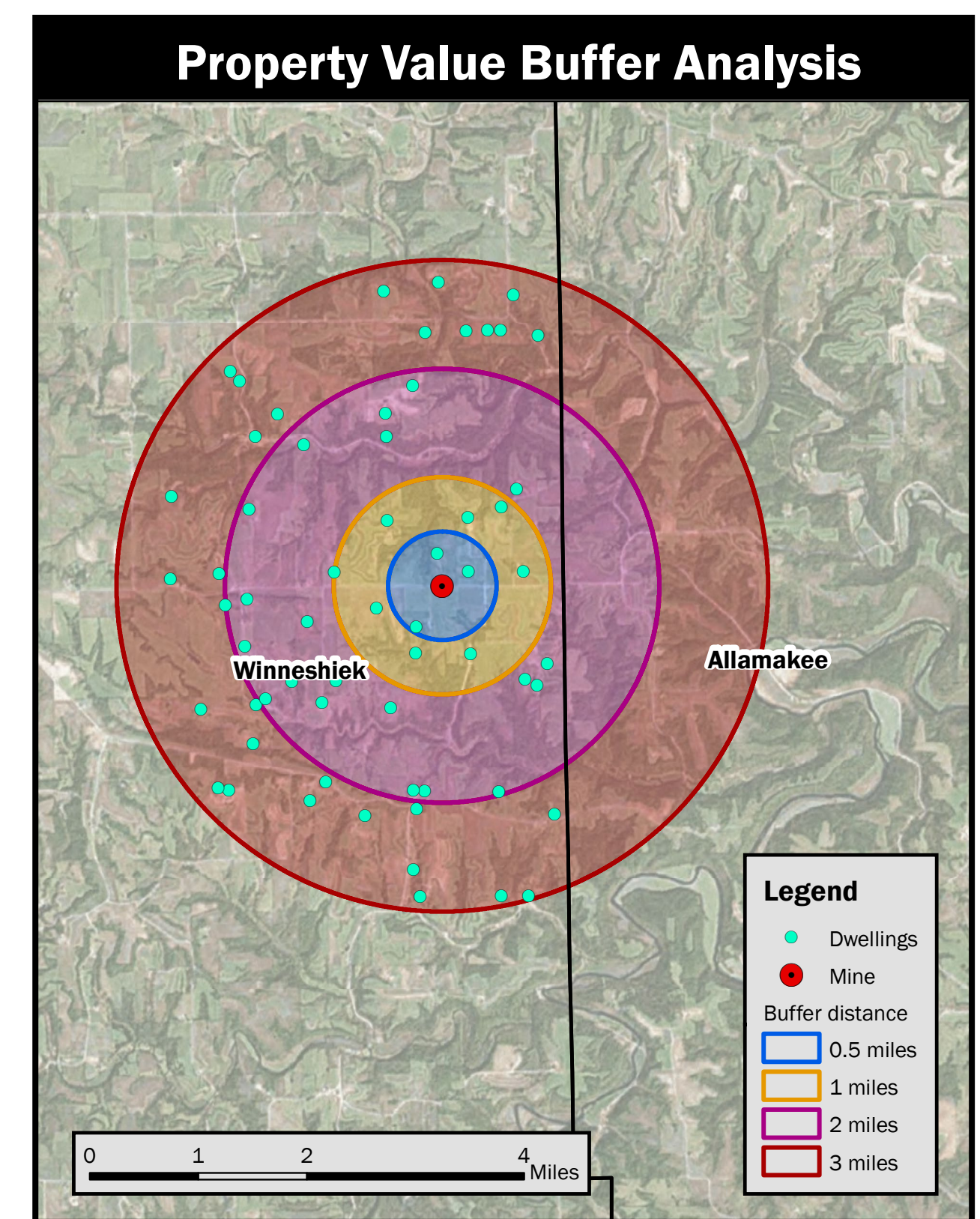
Private Accounts: Incomes and Property Values

Annual Labor Income: +\$1M

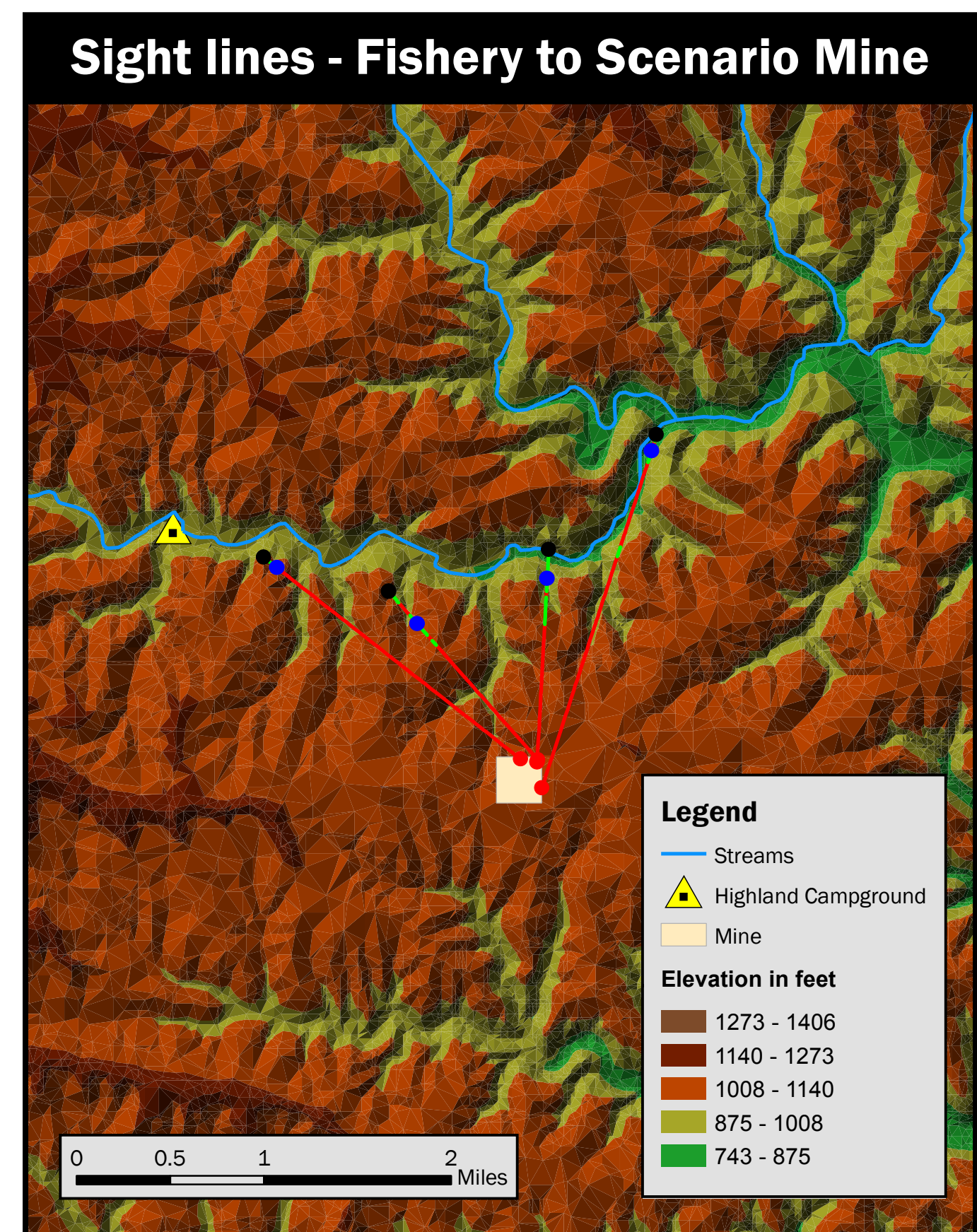
Export-based industries such as frac-sand mining create direct, indirect, and induced jobs and labor income. Each new job will be filled by a local resident or in-commuter. Using input-output analysis, and adjusting by the current proportions of in-commuters and out-commuters, additional labor income related to mining activity was estimated. Uncertainty over the potential number of trucking jobs leads to a large range in the total estimate for annual labor income.

Assessed Property Value: -\$841K

Assessed values for residential properties proximal to the mine are projected to decline. Our buffer analysis incorporates coefficients from a housing hedonic model to estimate net depreciation for homes within a radius of 0.5, 1, 2, or 3 miles. Because market values are factored into reassessment, assessed values and associated property taxes may change gradually.



Social Costs: Fisheries Quality and Tourism



Annual Impacts: Not Quantified

The potential exists for frac-sand mining activity to negatively impact County tourism, which is comprised largely of in-state visitors who come to experience the region's scenic bluffs and waterways. Research shows that anglers' demand is correlated with biomass; if water quality deteriorates and trout populations decline, there may be less demand for Winneshiek County's streams. However, our analysis of Wisconsin stormwater infractions suggests that oversedimentation is unlikely to occur when mines are set back 0.75 miles from the stream. Furthermore, our sight-line analysis demonstrates that the scenario mine would not be visible to observers at South Bear Creek. Finally, trends in direct visitor spending in Wisconsin's mining and non-mining counties suggest that recreational tourism has not suffered as a result of frac-sand mining.