Land Use Atlas for Coastal Watersheds in the Maritimes Region

Javier Guijarro-Sabaniel and Noreen E. Kelly

Fisheries and Oceans Canada
Science Branch, Maritimes Region
Coastal Ecosystem Science Division
Bedford Institute of Oceanography
PO Box 1006
Dartmouth Nova Scotia
Canada
B2Y 4A2

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Fisheries and Oceans Canada
Maritimes Region
Bedford Institute of Oceanography
P.O. Box 1006
Dartmouth, Nova Scotia
Canada B2Y 4A2

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ABSTRACT

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Human activities occurring on land can impact marine coastal ecosystems, yet baseline information on the spatial distribution and intensity of such activities across broad spatial scales remains a knowledge gap. To advance this knowledge, land use maps were generated for 109 coastal watersheds draining into the Maritimes Region of Fisheries and Oceans Canada. Land use maps were compiled from publicly available spatial data sources and grouped into one of four sub-regions (Cape Breton Island, Eastern, Western, Bay of Fundy). Each map provides areal values of different land cover types (such as forested areas, pervious or impervious surfaces, agricultural areas, peatlands, parks and protected areas, wetlands and freshwater bodies), human population density, civic address locations, and locations of riverine outflows (i.e. pour points). Collectively, the maps demonstrate an anthropogenic gradient in land use, illustrating the footprint of human settlement and activity across the broader region. While most watersheds are predominantly forested, some watersheds have high percentages of agriculture or impervious cover from urban development. This atlas provides quantitative measures of the spatial extent of human land-use alterations across the Maritimes Region, which may be useful for risk analyses, conservation planning purposes in both freshwater and coastal marine environments, and cumulative effects mapping and analysis.

RÉSUMÉ

Guijarro-Sabaniel, J., and Kelly, N.E. 2022. Land Use Atlas for Coastal Watersheds in the Maritimes Region. Can. Tech. Rep. Fish. Aquat. Sci. 3494: viii + 135 p.

Les activités humaines sur terre peuvent avoir un impact sur les écosystèmes côtiers marins. Hors, il subsiste des lacunes dans les renseignements de base sur les emplacements et l'intensité de ces activités à grande échelle. Afin d'approfondir les connaissances à ce sujet, des cartes d'utilisation des terres ont été créées pour 109 bassins versants côtiers se déversant dans la région des Maritimes de Pêches et Océans Canada. Ces cartes ont été établies à partir de diverses sources de données spatiales accessibles au public et divisées en quatre sous-régions (Île du Cap-Breton, Est, Ouest et baie de Fundy). Chaque carte fournit des statistiques de base sur les surfaces de différentes couvertures terrestres (telles que les zones forestières, les surfaces perméables ou imperméables, les zones agricoles, les tourbières, les parcs et les zones protégées, les zones humides et les plans d'eau douce), la densité de la population humaine, les emplacements des bâtiments et les emplacements des principaux points duquel l'eau d'une région s'écoule (points d'écoulement). Combinées, ces cartes montrent le gradient anthropique dans l'utilisation des terres, illustrant ainsi l'empreinte de l'occupation et de l'activité humaines dans la région en général. Même si les bassins versants sont principalement boisés, certains comptent de forts pourcentages de terres agricoles ou de surfaces imperméables en raison du développement urbain. Cet atlas fournit des mesures quantitatives de la portée spatiale de l'utilisation des terres par les humains dans la région des Maritimes, lesquelles pourraient être utiles aux fins d'analyse, de planification de la conservation dans les milieux d'eau douce et côtiers et dans la cartographie et l'analyse des effets cumulatifs.

INTRODUCTION

Coastal ecosystems are highly vulnerable to human activities. The close proximity of human settlements to coastal ecosystems means they are often exposed simultaneously to intense fishing pressure, run-off of land-based nutrients and pollutants, shipping, and coastal development, among other stressors (Lu et al., 2018; Halpern et al., 2019; Thrush et al., 2021). Baseline information on the locations and intensity of these stressors are critical components of any impact assessment or spatial planning approach seeking to mitigate stress and protect or restore coastal ecosystems.

Land-based human activities can impact coastal marine areas through watershed-level processes, such as pollutants like fertilizers and pesticides that are transported from land to coastal waters via streams and rivers. For example, for select embayments along the Scotian Shelf, Murphy et al. (2019) found that land-based human activities (e.g., land alteration from urban or agricultural use, human population density, nutrient loading) contributed to the risk of decline for eelgrass, an important biogenic habitat prioritized for marine protection (DFO 2009a). Multiple studies have identified the need to include land-based activities in any management of marine coastal zones (Alvarez-Romero et al., 2015; Brown et al., 2018; Birch and Reyes 2018). However, for the DFO Maritimes Region, a comprehensive collection of information on many land-based human uses across a broad spatial scale remains a significant knowledge gap.

The land-use maps presented herein are a first attempt to fill this knowledge gap. They were originally created as part of a larger effort to estimate nutrient loading in coastal watersheds across the Maritimes Region (see Kelly et al., 2021; Kelly and Guijarro-Sabaniel 2022). A prerequisite of this project required the compilation of disparate sources of spatial data within 109 coastal watersheds in Nova Scotia and New Brunswick into Geographic Information Systems (GIS) based maps detailing human land use in coastal watersheds. This report contributes additional documentation on the creation of these watershed land-use maps, while also provides a robust table of data sources, enabling rapid updating of source information for future iterations or research purposes. Each map included in this report is publicly available for additional uses at DFO and in the wider research community through the Government of Canada's Open Data portal.[1] The present atlas provides baseline information needed for analyses and models to assess impacts of human land uses on the coastal zone of the Bay of Fundy and Scotian Shelf, and may aid in marine spatial planning, ecological risk assessment, aquaculture management, cumulative impact mapping, coastal marine protected area network design, fish and fish habitat protection, and coastal restoration work.

MATERIALS AND METHODS

This atlas contains information on land uses compiled from open federal and provincial government data sources (Table 1). All mapping analyses (i.e. area calculations, watershed

[1] See https://open.canada.ca/data/en/dataset/85d6c4c2-6683-4d56-adf4-8cacef2676be

boundary determinations) were conducted in ArcGIS 10.6 (ESRI 2018). Analyses of land-use patterns across watersheds were conducted in R (R Core Team, 2021).

STUDY AREA AND WATERSHED BOUNDARIES

This study focuses on coastal watersheds located in the Scotian Shelf Biogeographic Marine Management Sub-region (hereafter "Maritimes Region") of Fisheries and Oceans Canada (DFO 2009b), which spans portions of the coastlines of the provinces of New Brunswick (NB) and Nova Scotia (NS) in Atlantic Canada (Fig. 1).

Watershed boundaries were created to achieve a balance among the scale of available data, the ability to capture the relevant human activities within hydrologically meaningful borders, and the need to maintain a manageable number of watersheds throughout the sub-region for logistical tracking purposes. To predict the watercourse drainage patterns, a digital elevation model (DEM) for each province was combined with national hydrographic data (Table 1). To delineate the watershed boundaries in each province, the flow direction and accumulation grid were calculated for each DEM. The *Stream Order* tool in ArcMap was used to create stream orders for the stream network. Values of stream order ≥4 were used to locate the highest flow accumulation value for each watershed. In some areas, such as Bras d'Or Lake (Cape Breton, NS) and Grand Manan Island (NB), a stream order equal to 3 was selected. The locations of these values were used to assign the coastal pour points (i.e. the point at which water flows out of an area) for each watershed. The pour points also helped to delineate the watersheds along with the national hydrographic data (Table 1). This method resulted in a total of 109 watersheds: 85 in NS and 24 in NB.

For ease of reference, the study area was divided into 4 sub-regions: Bay of Fundy, Eastern, Western, and Cape Breton Island (Fig. 1). The watersheds with coastal pour points draining into the Bay of Fundy, regardless of province, were included in the Bay of Fundy Sub-region. All watersheds in Cape Breton Island were grouped into the Cape Breton Island sub-region, regardless of pour point drainage location (Bras d'Or Lake or Atlantic Ocean). The Western and Eastern sub-regions were delineated using the city of Halifax as the frontier between the two sub-regions.

LAND COVER

To estimate the area of land cover types in each watershed, several digital land cover and land use datasets were gathered from the open data portals of the provinces of NS and NB (Table 1). Land cover types included forest, wetlands, inland water, agriculture, parks and protected areas, turf, peatland (harvested, non-harvested), and developed urban areas and roads, which were further subdivided into pervious and non-pervious surfaces. The GIS layers of different land cover types were assigned to the watersheds using the *Intersect* tool in ArcGIS. To avoid overlap between different land cover types in each watershed, we first divided the layers between natural (forest, water, and wetland) and human land use (agriculture, impervious, pervious, and peatland), then applied the *Erase* tool in ArcMap to remove overlapping areas between polygons. Beginning with the forest layer, we sorted the remaining layers as erase features in order of decreasing spatial coverage: (1) water, wetland, agriculture, impervious, pervious, and peatland

(human); (2) for the water: wetland, agriculture, impervious, pervious, and peatland; wetland: agriculture, impervious, pervious, and peatland; agriculture: impervious, pervious, and peatland; impervious: pervious and peatland; and pervious: peatland. After the final subtraction, land use units were summed to calculate the area of each type of usage per watershed.

For those watersheds located in the province of NS, the Nova Scotia Forest Inventory was used to calculate areas covered by forest, wetlands, and agricultural fields (Table 1). The Nova Scotia Topographic DataBase (NSTDB) contained several datasets which were used to estimate the total area of turf, pervious, and impervious surfaces in each watershed (Table 1). The Roads, Trails and Rails dataset was used to delineate the areas of roads, trails, and railroads. This dataset is represented by lines; in order to convert these features into a 2-dimensional polygon, we added a buffer around the lines to estimate the spatial footprint for these features in each watershed. Using the imagery basemap from ArcGIS Online (ESRI 2019) we measured randomly 25 roads for each province, and calculated the average width (~ 3 m). We applied this same buffer for trails and railroads. The Designated Areas dataset included the spatial extent of developed urban areas such as parking lots and industrial areas, but also cemeteries, golf courses, rest areas, and sport fields (Table 1). The Buildings dataset was used to extract the non-residential building footprints (e.g., factories, fire stations, churches, etc.). These three datasets contain information about which type of surface (pervious or non-pervious) is associated with each feature layer, and so land cover from all three datasets was further subdivided into pervious and impervious surfaces. The Water Features dataset was used to delineate the area of freshwaters (i.e. lakes, rivers, and ponds).

For those watersheds located in the province of NB, the land cover and land use datasets were collected from NB's provincial digital geographic database (GeoNB) to extract information on the area of forest, wetlands, peatlands (harvested and non-harvested), civic address and lots, recreation, industrial, infrastructure, and agricultural areas (Table 1). We used the Non-Forest dataset to identify the areas of cemeteries, golf courses, and sports fields. The New Brunswick Road Network (NBRN) dataset was used to delineate the areas of roads, trails and railroads (Table 1). To estimate the spatial footprint of these features in each watershed, the same approach for the Roads, Trails and Rails dataset in NS was applied. The New Brunswick Hydrographic Network (NBHN) (Table 1) was used to represent the area of freshwater.

To calculate land cover in residential areas in NB and NS, we followed the calculations outlined in Nagel et al., (2018) to determine the area covered by residential turf (i.e. lawns and gardens), as well as the amount of impervious (i.e. roofs + driveways) and pervious cover (i.e. residential forested areas). To calculate an average residential lot size for NB watersheds, we matched civic address locations with property parcels, or lots, using the Digital Property Map layer from the Provincial Digital Geographic Database (Table 1). Large non-residential lots with assigned civic addresses (e.g., provincial parks) and lots > 50 ha were excluded, as they overlapped with areas designated as farmland. The proportion of residential lots covered by turf, impervious, and other pervious surfaces were then calculated for a random sample of 25 lots in each watershed. For NS watersheds, we used information from the Nova Scotia Property Records Database (NSPRD; Table 1); property parcel boundaries were overlaid onto an imagery base map (ESRI 2019) from which we calculated the areas of turf, impervious, and pervious surfaces,

using a random sample of 25 parcels within each watershed. The total area of residential cover (turf, impervious, and pervious) in each watershed was then determined by multiplying the average percent residential cover by the average lot size and number of lots. Because of the summary nature of these calculations, the turf land-use category associated with residential cover does not have associated spatial location information.

HUMAN POPULATION

To estimate the population density (persons ha^{-1}) in all watersheds, the civic address dataset from both provinces was used (Table 1). The population size for each watershed was calculated using the number of civic addresses present in each watershed and multiplying this by the average number of residents per household (2.3) in NS and NB (Statistics Canada 2017). Population density was calculated using the population size in each watershed divided by the watershed area in hectares. The civic address in each watershed was classified into 2 categories, within 200 m of the coastline and greater than 200 m (Nagel et al., 2018), used to estimate direct effects of human habitation immediately adjacent to the coastline (see Kelly et al., 2021 for further details).

MAPPING

Geodatabases were generated for each province containing geospatial data for each land-use in each watershed. To optimize the process of creating the maps the *Data Driven Pages* tool was used, which enabled the creation of a multi-page map series from a single map document. In total, 109 watershed land use maps were created and are presented herein. For each map, the total watershed area, population density (persons ha^{-1}), percentage of total land-use values, civic address locations within or outside the 200 m boundary from the coastline, and the pour point, are provided in addition to the spatial extent of each land-use category (except for turf, which is not included as spatially explicit data). The spatial extent of parks and protected areas are also included in each map. The geographic position of the watershed within the sub-region is also highlighted in the inset of each map.

ANALYSIS

We conducted two separate but complementary analyses to compare patterns in land use in all watersheds across the Maritimes Region, as well as among the four sub-regions. First, we compared the percentage contribution of different land-use types to identify the dominant land uses in watersheds. Second, a Principal Component Analysis (PCA) was used to visualize gradients in percentages of land-use types and identify land cover types that explained the most variation in land use. Land cover types were centered and scaled before analysis. We considered any land cover type that had contributed more than one variable worth of information (>0.353) as an important contributor to the principal component.

RESULTS

The atlas is arranged by watershed sub-region: Bay of Fundy (Figs. 4 – 50), Eastern (Figs. 51 – 68), Western (Figs. 69 – 93), and Cape Breton Island (Figs. 94 – 116). In each section, the watershed sub-region map is presented first, followed by the individual watershed maps. Raw

data (i.e. area values in hectares) for land-use types in each watershed are displayed in Table 2. All maps are available for download through the Government of Canada's Open Data portal (Guijarro-Sabaniel and Kelly, 2022).

Across all coastal watersheds in the Maritimes Region, the percentage contribution to total watershed area was highest for forest cover (range = 44 – 98%, mean = 79.4, median = 80.1), followed by wetlands (range = 0.6 – 24.1%, mean = 7.79, median = 6.64), freshwater (range = 0.2 – 16.6%, mean = 4.45, median = 4.37), agriculture (range = 0 – 40%, mean = 3.64, median = 1.12), pervious surfaces (range = 0.2 – 10.2%, mean = 2.95, median = 2.43), impervious surfaces (range = 0.1 – 21%, mean = 1.07, median = 0.52), turf (range = 0 – 11.1%, mean = 0.65, median = 0.23) and peatland (range = 0 – 0.5%, mean = 0.02, median = 0) (Fig. 2a). Minor differences in this pattern of land use extent were observed among the sub-regions (Fig. 2b). For example, the Bay of Fundy sub-region had both the highest and lowest percentage cover values for forest (range of 44% – 98%), agriculture (0% – 40%), wetlands (0% – 25%), and peatlands (0 – 0.5%). Turf (0.04 – 11.1%) and pervious (0.9 – 10.1%) land uses were highest in watersheds from the Western sub-region, while Eastern sub-region watersheds displayed the largest range of freshwaters (3.4 – 16.6%; Fig. 2b). The range of percentage cover of impervious land-use was greatest in watersheds in the Eastern sub-region (0.1 – 21%) and lowest in watersheds of the Cape Breton Island and Bay of Fundy sub-regions (<3%) (Fig. 2b). Peatland cover was low across all watersheds in the Eastern, Western, and Bay of Fundy sub-regions (<1%). Peatland was not present in Cape Breton Island sub-region watersheds.

The first two principal component axes in the PCA explained ~54% of the total variance in land-use types across all watersheds (Fig. 3). The first principal component separated predominantly forested watersheds from those with higher values of other land cover types; watersheds with higher values of turf, pervious, and peatland cover, or watersheds with higher values of impervious cover. The second principal component separated watersheds with high values of wetlands and freshwaters from those with high values of agriculture. Eastern and Western sub-region watersheds generally had higher values of wetland and freshwater cover than Bay of Fundy and Cape Breton watersheds, which generally exhibited greater proportions of agriculture (Figs. 2b, 3). Together, these axes demonstrate that land-use in the Maritimes Region is represented primarily by a gradient between forest cover and human activities, and secondarily by the variation in natural water features present on the landscape (Fig. 3).

DISCUSSION

This collection of high-resolution maps provides quantitative measures of the spatial extent of human land-use alterations across the Maritimes Region. Collectively, the maps demonstrate an anthropogenic gradient in land use and illustrate the footprint of human settlement and activity across the broader region. While most watersheds are predominantly forested, some watersheds have high percentages of agriculture (e.g., Ga_2, Ga_3, P_4) or impervious surfaces from urban development (e.g., watersheds S_2, S_3). Human activities that change sedimentation and pollutant run-off, in particular agriculture, forestry, and urbanization, can result in changes to freshwater and marine water quality, habitats, and fisheries (Brown et al., 2018; Breitburg et al.,

2018; Malone and Newton 2020). For example, significant negative effects on submerged aquatic vegetation (Li et al., 2007), nearshore faunal communities (Kornis et al., 2017), and freshwater stream ecosystems (Jackson et al., 2022) have been documented at 18 – 30% agricultural or developed land cover. Quantifying the spatial extent of human land-use change is thus critical to providing the baseline information necessary to determine the potential impacts of terrestrial human activities on freshwater, estuarine, and coastal and marine ecosystems.

Users of this atlas should recognize that the estimates of pervious and impervious surfaces have greater uncertainty than for other surface types. Due to data limitations, the areal extent of pervious and impervious surfaces from roofs and driveways within urban and residential areas, as well as paved and unpaved roads and trails, could be underestimated. For example, spatially explicit data delimiting roofs and driveways were not available in either province, and so we used an average area from a random subset of available residential lots (see section *Materials and Methods: Land cover*). Due to the spatial resolution of the available datasets, the estimated buffers around roads and trails are good representations for highways and other wide roadways, but are likely overestimates for smaller secondary roads and trails. Finally, classifying impervious and pervious surfaces were conducted by overlapping feature layers with aerial imagery; the resolution of air photos used to interpret and digitize these land uses varied between and within provinces. As additional spatial data improves, these estimates can be easily updated within the maps in future. Alternately, novel approaches such as using multispectral imagery could be used in future to classify impervious and pervious surfaces which would increase the accuracy of the areal estimates of these surface types.

Land-use maps form the baseline knowledge of the state of watersheds, and are key prerequisites required to estimate spatial impacts of human activities in aquatic ecosystems (Sheelanere et al., 2013). In a recent publication, Kelly et al., (2021) used the atlas to estimate nitrogen loading to the coastal zone of the Maritimes Region, as well as estimate potential impacts of eutrophication on seagrass beds in 40 embayments. These maps can also be useful for other conservation and/or planning initiatives at Fisheries and Oceans Canada and by coastal communities and municipalities, such as for the protection of fish and fish habitat including ecologically significant freshwater areas, coastal or marine conservation areas network planning, and coastal land-use planning bylaws and strategies. At a time when coastal zones are experiencing pressures from multiple human stressors (Lu et al., 2018), baseline information on the state of watersheds provides an opportunity to support land-sea conservation planning initiatives (e.g., Alvarez-Romero et al., 2015). For example, this atlas could be a useful component to support effective watershed management, and in particular for the general assessment of, and calculation of threats to, watershed health (e.g., Sterling et al., 2014). Finally, managers could use this atlas to account for human land-use activities during environmental or cumulative impact assessments on the coastal zone (e.g., Alvarez-Romero et al., 2014; Kappel et al., 2012; Murphy et al., 2019, 2022).

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TABLES

Table 1. List of data sources, years of coverage, and hyperlinks (where available), used in the creation of this land use atlas. NB = New Brunswick; NS = Nova Scotia.

Monitoring program or dataset name	Province	Description	Years of data coverage	Source	Component of calculation
Georeferenced Civic Address Data Base (GCADB)	NB	Includes a geo-referenced civic address database	2019	http://www.snb.ca/geonb1/e/DC/GCADB.asp	Civic addresses Population density
Province of Nova Scotia Geographic data directory	NS	Physical locations which have been assigned a civic number by Municipalities and First Nations Communities.	2015	https://data.novascotia.ca/Municipalities/Nova-Scotia-Civic-Address-File-Civic-Points/tntn-er5g	Civic addresses Population density
NS Topographic database (NSTDB)	NS	Land cover [utilities (i.e. transmission lines, tanks) and buildings (i.e. community centers, fire stations) layers]	2019	https://data.novascotia.ca/Lands-Forests-and-Wildlife/Nova-Scotia-Topographic-DataBase-Land-Cover-Map/2mpd-kw4r	Land cover: pervious surface Land cover: impervious surface
		Water features (lakes, rivers, swamps, breakwater, wharf, canal, dam, dyke, falls, rapids, reservoirs)	2019	https://data.novascotia.ca/Lands-Forests-and-Wildlife/Nova-Scotia-Topographic-DataBase-Water-Features-Po/h8jb-hzrm	Land cover: freshwater
		Designated areas (parking lots, pits, campgrounds, sport fields, cemeteries, peat cutting)	2019	https://data.novascotia.ca/Lands-Forests-and-Wildlife/Nova-Scotia-Topographic-Database-Designated-Areas/ty4r-gcnk	Land cover: pervious surface Land cover: impervious surface Land cover: turf Land cover: peatland
		Roads, Trails, Rails (road, trail, railroad, bridge, track)	2019	https://data.novascotia.ca/Roads-Driving-and-Transport/Nova-Scotia-Topographic-DataBase-Roads-Trails-and-/845c-gbqt	Land cover: pervious surface Land cover: impervious surface
Forest Inventory	NS	Includes information on forest cover, wetlands, agriculture and blueberry fields, industrial areas (i.e. gravel pits, pipeline corridors).	2016	https://data.novascotia.ca/Lands-Forests-and-Wildlife/Forest-Inventory/c8ai-fjbt	Land cover: forest Land cover: agriculture Land cover: wetland Land cover: pervious surface Land cover: impervious surface

Monitoring program or dataset name	Province	Description	Years of data coverage	Source	Component of calculation
Nova Scotia Protected Areas System	NS	Included National Parks, National Wildlife Areas, Provincial Wilderness Areas, Provincial Nature Reserves, selected Provincial Parks and selected land trust properties and easements.	2019	https://data.novascotia.ca/Environment-and-Energy/The-Nova-Scotia-Protected-Areas-System/ticv-5du5	Land cover: parks and protected areas
New Brunswick Road Network (NBRN)	NB	Includes road centerlines, road names, road class, surface type, address ranges and other road attributes	2019	http://www.snb.ca/geonb1/e/DC/NBRN.asp	Land cover: pervious surface Land cover: impervious surface
Forest	NB	Forest cover polygons interpreted from aerial imagery.	2017	http://www.snb.ca/geonb1/e/DC/forest.asp	Land cover: forest
Non- forest	NB	Non-forest cover polygons interpreted from aerial imagery (i.e. non-forest characteristics including agriculture, settlement, utility corridors, etc.)	2015	http://www.snb.ca/geonb1/e/DC/non-forest.asp	Land cover: agriculture Land cover: pervious surface Land cover: impervious surface Land cover: turf
Wetland	NB	Provincially significant wetlands and other wetland types (i.e. coastal wetlands, unique forested wetlands, floodplain wetlands, aquatic bed, bog, fen, shrub, freshwater marsh).	2011	http://www.snb.ca/geonb1/e/DC/RW.asp	Land cover: wetland Land cover: freshwater
Peatland	NB	Polygons that depict the perimeter of individual peatlands.	2013	http://www.snb.ca/geonb1/e/DC/peat.asp	Land cover: peatland
Pipelines	NB	Approximate centerline location of major energy transmission pipelines including the name of each pipeline.	2013	http://www.snb.ca/geonb1/e/DC/pipe.asp	Land cover: impervious surface
Federal Parks and Protected Areas	NB	The administrative boundaries (exterior limits) of National Parks in New Brunswick	2012	http://www.snb.ca/geonb1/e/DC/FFPPA.asp	Land cover: parks and protected areas

Monitoring program or dataset name	Province	Description	Years of data coverage	Source	Component of calculation
Provincial Parks	NB	Polygons representing the limits of the provincial parks in New Brunswick	2019	http://www.snb.ca/geonb1/e/DC/ProParks.asp	Land cover: parks and protected areas
National Hydro Network (NHN)	NB, NS	Geometric description and basic attributes describing Canada's inland surface waters. It provides geospatial digital data for lakes, reservoirs, watercourses (rivers and streams), canals, islands, drainage linear network, toponyms or geographical names, constructions and obstacles related to surface waters, etc.		https://open.canada.ca/data/en/dataset/a4b190fe-e090-4e6d-881e-b87956c07977	Watershed boundaries Location of pour points
New Brunswick Hydrographic Network (NBHN)	NB	Surface drainage features including rivers, streams, lakes, islands, and watershed boundaries including names for many rivers and streams.	2018	http://www.snb.ca/geonb1/e/DC/NBHN.asp	Land cover: freshwater
Canadian Digital Elevation Model Mosaic	NB	The Canadian Digital Elevation Model (CDEM) is part of Natural Resources Canada's altimetry system designed to better meet the users' needs for elevation data and products.	2011	https://open.canada.ca/data/en/dataset/7f245e4d-76c2-4caa-951a-45d1d2051333	Watershed boundaries Location of pour points
DP ME 55, Version 2, 2006, Enhanced Digital Elevation Model, Nova Scotia, Canada	NS	This digital product consists of a hydrologically correct 20m Digital Elevation Model for the province of Nova Scotia.	1986-1999	https://novascotia.ca/natr/meb/download/dp055.asp	Watershed boundaries Location of pour points
Property Assessment Map	NB	Provides a digital representation of the property assessment parcels.	2019	http://www.snb.ca/geonb1/e/DC/propmap.asp	Residential lot size Land cover: turf Land cover: pervious surface Land cover: impervious surface
Digital Property Map	NB	Includes approximate boundaries for all land parcels.	2019	http://www.snb.ca/geonb1/e/DC/DPM.asp	Residential lot size Land cover: turf

Monitoring program or dataset name	Province	Description	Years of data coverage	Source	Component of calculation
					Land cover: pervious surface Land cover: impervious surface
Nova Scotia Property Records Database (NSPRD)	NS	Property parcels	2020	https://novascotia.ca/sns/access/land/property-online.asp	Residential lot size Land cover: turf Land cover: pervious surface Land cover: impervious surface

Table 2. Total area and areal values of 8 land cover types in 109 coastal watersheds in the Maritimes Region. All area values are given in hectares (ha). The corresponding figure number for each land use map is also listed.

Watershed ID*	Total Area**	Agriculture	Forest	Impervious	Pervious	Peatland	Turf	Wetland	Freshwater	Fig. no.
A_1	175819	17979.59	133468.4	1005.32	4842.67	54.04	831.12	8919.85	7391.94	Fig. 5
A_2	43215	3075.77	37330.79	186.82	998.42	0	174.21	613.77	260.02	Fig. 6
Av_1	130674	9529.45	102176.7	598.79	3995.87	0	723.92	5467.82	6760.27	Fig. 7
Br_1	47091	778.27	42186.24	366.4	965.13	0	24.04	1923.31	307.91	Fig. 102
Br_10	12911	116.33	11064.92	50.16	545.4	0	10.47	753.78	168.31	Fig. 111
Br_11	10726	156.75	9255.98	67.84	310.38	0	12.27	538.64	104.06	Fig. 112
Br_2	46905	900.8	39179.51	490.59	1640.27	0	93.39	3073.2	974.7	Fig. 103
Br_3	46701	919.52	40892.77	153.72	1532.16	0	15.9	2106.47	539.94	Fig. 104
Br_4	37114	531.52	32635.15	123.35	681.05	0	85.8	1882.4	504.85	Fig. 105
Br_5	24037	504.26	19997.34	133.62	694.56	0	22.28	1139.4	546.35	Fig. 106
Br_6	23403	916.05	20642.88	105.99	535.62	0	36.11	675.28	128.26	Fig. 107
Br_7	19115	1602.65	14633.9	187.04	610.99	0	51.13	480.98	196.36	Fig. 108
Br_8	16602	180.78	14380.34	85.91	583.78	0	89.48	739.38	340.42	Fig. 109
Br_9	14435	106.32	12521.06	48.99	242.39	0	8.01	832.73	318.54	Fig. 110
Ca_1	113379	1349.51	86558.02	420.97	3240.29	0	411.05	12643.85	7927.64	Fig. 113
Ca_2	47822	93.89	33449.14	299.88	467.27	0	26.76	9721.49	4239.74	Fig. 114
Ca_3	40238	1327.32	25408.99	843.54	3627.39	0	614.83	2729.67	1608.5	Fig. 115
Ca_4	21751	333.45	13997.72	288.65	1682.33	0	414	3061.08	867.66	Fig. 116
Cl_1	85688	106.38	67269.69	155.23	817.67	0	91.36	13483.73	4806.54	Fig. 70
Cl_2	57403	68.51	38983.62	340.03	1388.85	0	423.89	12331.33	3819.33	Fig. 71
E_1	49428	2101.36	43725.53	74.17	925.99	0	46.65	1846.1	284.41	Fig. 8
E_2	27808	2649.7	22714.03	86.45	717.98	0	72.42	728.56	180.98	Fig. 9
EW_1	63772	16.17	51760.96	88.68	901.03	0	46.51	6509.25	5115.85	Fig. 52
EW_2	41074	5.35	33150.16	663.42	585.97	0	19.81	3946.99	2832.08	Fig. 53
G_1	42702	422.18	36898.4	127.41	922.95	0	161.59	2516.14	1874.3	Fig. 72
G_2	41647	1494.3	30637.13	678.08	1749.56	0	476.57	2637.32	3473.05	Fig. 73
G_3	22600	178.3	19090.74	214.73	824.75	0	320.38	863.84	770.84	Fig. 74

Watershed ID*	Total Area**	Agriculture	Forest	Impervious	Pervious	Peatland	Turf	Wetland	Freshwater	Fig. no.
Ga_1	53474	3111.02	39748.45	186.73	1145.85	0	125.07	3774.24	5727.48	Fig. 10
Ga_2	43663	16513.13	18275.78	805.98	2407.86	223.53	941	1769.77	366	Fig. 11
Ga_3	36577	7748.01	25959.16	231.4	1025.1	0	177.46	534.57	72.6	Fig. 12
K_1	48323	4406.32	38137.71	145.38	1174.49	127.94	69.74	3856.38	216.01	Fig. 13
K_2	39284	2980.85	33252.75	90.5	795.19	0	59.45	1700.92	234.49	Fig. 14
K_3	23653	1422.53	19551.49	76.99	401.43	0	46.61	2356.48	136.27	Fig. 15
L_1	58438	9.62	46540.22	179.37	622.92	0	25.19	8365.64	2890.24	Fig. 54
L_2	41752	7.71	34296.4	103.45	509.62	0	33.23	3981.23	2705.2	Fig. 55
L_3	15025	0	12317.22	33.54	155.92	0	18.13	1353.18	1016.4	Fig. 56
La_1	168778	4123.04	139176.8	770.18	4415.31	0	942.48	10499.01	9465.89	Fig. 75
LK_1	616388	36647.53	481126.7	4400.61	29909.07	1013.74	4733.43	24116.55	29477.61	Fig. 27
M_01	197291	5750.56	162306.9	458.11	3130.64	0	377.72	12351.16	9307.2	Fig. 28
M_02	47344	1866.86	39498.49	126.14	962.05	0	38.06	3573.3	466.62	Fig. 29
M_03	34090	186.77	28316.76	101.03	821.46	0	46.17	2122.62	2115.06	Fig. 30
M_04	24202	114.27	19409.06	108.62	480.08	0	19.65	2087.31	1616.11	Fig. 31
M_05	23756	5.57	18303.15	78.68	760.79	82.09	13.07	2207.11	2164.46	Fig. 32
M_06	15670	160.73	13279.33	30.53	291.14	0	9.85	1084.7	558.22	Fig. 33
M_07	15436	1028.56	12091.1	123.88	685.25	0	30.77	968.39	153.88	Fig. 34
M_08	14156	64.99	10806.11	222.3	736.45	0	206.63	1000.52	151.65	Fig. 35
M_09	10522	182.2	8276.65	114.64	652	0	138.68	303.31	783.16	Fig. 36
M_10	3954	7.13	2839.41	83.1	322.13	0	110.52	421.02	51.24	Fig. 37
M_11	3204	0.94	2518.01	51.37	225.35	0	38.53	166.64	24.21	Fig. 38
Med_1	166219	1479.2	136806.6	392.5	3175.32	0	213.71	12570.39	13806.41	Fig. 76
Med_2	28182	997.86	21002.84	305.82	1002.36	3.47	165.34	1765.97	2596.2	Fig. 77
Mer_1	204523	292.49	152098.4	228.2	1983.01	8.85	97.88	23162.84	30042.95	Fig. 78
Mer_2	66177	84.65	52125.14	124.6	836.14	37.2	64.76	13194.25	1112.23	Fig. 79
Mer_3	40425	5.87	32551.18	436.93	563.86	0	69.92	6486.86	1413.06	Fig. 80
Met_1	36923	826.63	28665.28	315.52	1346.57	0	247.98	3780.01	2475.28	Fig. 16
Met_2	32474	824.62	24615.83	129.3	748.97	0	92.7	3001.65	3639.65	Fig. 81
M-P_1	85615	3883.5	73763.45	189.97	1703.77	0	175.84	5078.11	283.59	Fig. 17

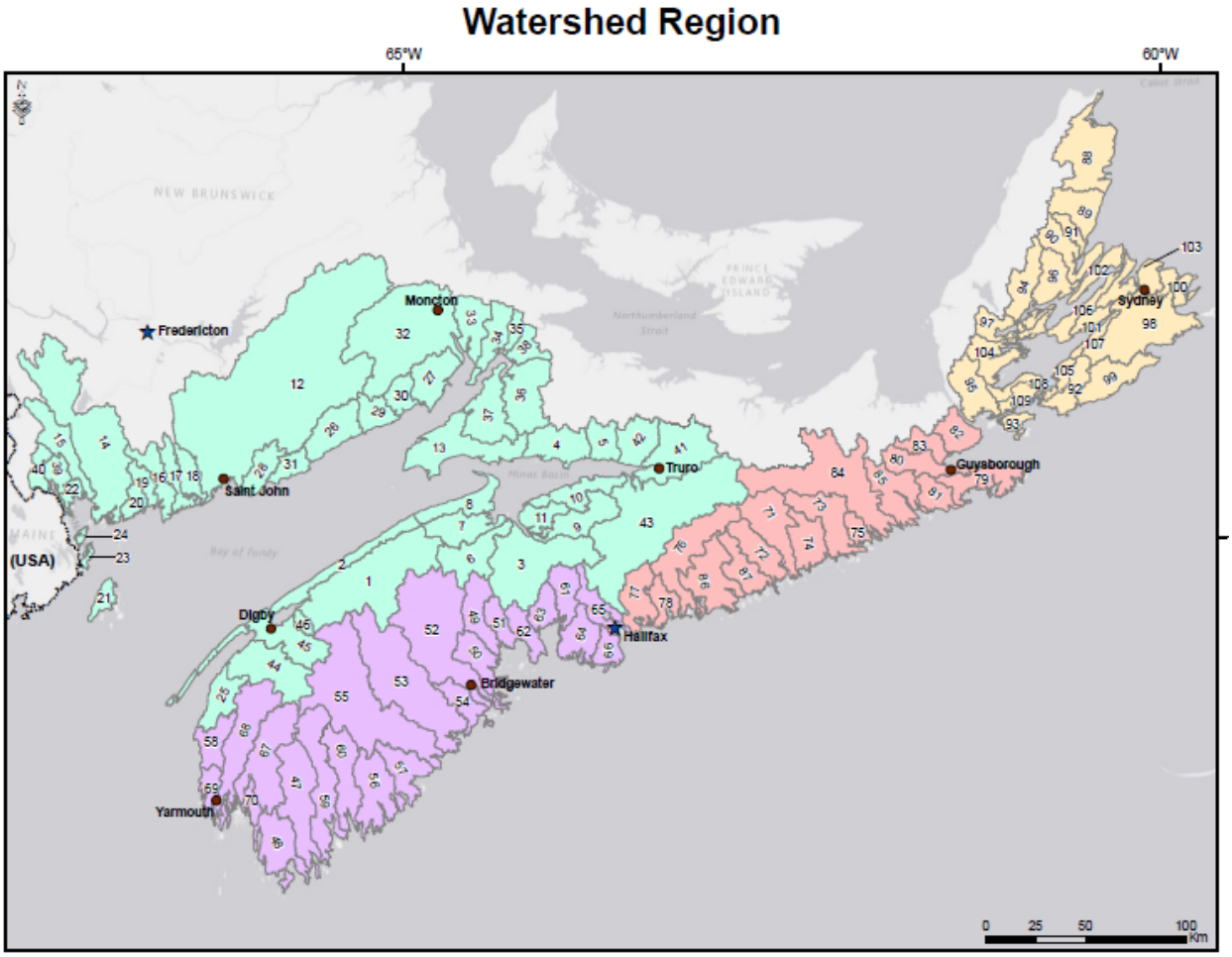
Watershed ID*	Total Area**	Agriculture	Forest	Impervious	Pervious	Peatland	Turf	Wetland	Freshwater	Fig. no.
Mus_1	83655	5219.83	64836.42	483.22	1766.99	0	302.73	6825.13	4483.58	Fig. 57
Mus_2	44014	161.98	32290.5	732.03	2110.81	0	2515.16	3372.15	2899.4	Fig. 58
Mus_3	22625	54.98	14767.56	237.62	1109.93	0	235.07	1710.44	3597.25	Fig. 59
NH_1	44347	6.86	26560.89	9159.58	472.71	0	109.33	4222.96	3096.05	Fig. 60
NH_2	37413	227.11	31652.03	887.44	737.38	0	21.5	2568.73	1867.1	Fig. 61
NH_3	25478	0	18275.85	2541.16	225.36	0	11.21	2477.86	1960.33	Fig. 62
P_1	199768	17586.98	154169.5	2691.1	11534.09	0	4618.11	4720.1	1067.6	Fig. 39
P_2	44951	5175.78	34489.03	291.89	1924.65	0	483.02	1310.34	182.57	Fig. 40
P_3	33302	6117.18	22412.06	229.33	1293.98	0	538.77	2062	443.36	Fig. 41
P_4	11833	3032.49	6271.54	27.06	181.9	0	31.76	1217.63	369.53	Fig. 42
Ph_1	69695	6649.71	55212.54	318.49	1870.85	0	235.53	4130.61	810	Fig. 18
Ph_2	59152	4404.41	49275.3	92.04	867.9	0	46.7	3892.55	556.71	Fig. 19
Ph_3	21763	3163.16	10832.78	156.25	629.15	0	236.11	5093.84	987.38	Fig. 20
PW_1	49164	102.64	46575.86	114.71	311.3	0	24.43	1093.21	413.15	Fig. 43
PW_2	45387	2844.36	38342.26	139.28	592.27	0	154.25	2175.62	488.34	Fig. 44
PW_3	30103	277.01	23698.56	220.45	1244.36	0	206.41	2075.54	1964.11	Fig. 45
PW_4	26200	5.19	25194.37	21.96	67.22	0	0	254.74	132.07	Fig. 46
PW_5	22447	88.86	21320.75	57.98	298.23	0	46.94	146.47	84.8	Fig. 47
PW_6	19762	567.13	17085.8	156.85	560.46	0	118.97	751.63	153.79	Fig. 48
R_1	83886	65.16	66938.15	348.6	1029.21	0	146.14	10879.47	4988.62	Fig. 82
R_2	57158	8.92	46061.2	52.22	538.25	0	25.81	8156.65	3932.98	Fig. 83
Ri_1	30982	210.3	23322.77	77.59	875.51	0	26.1	3776.72	2517.69	Fig. 99
Ri_2	16379	127.43	13115.93	90.67	581.36	0	25.28	1459.49	472.25	Fig. 100
Ri_3	11315	152.36	7386.85	123.21	570.37	0	89.07	1568.79	755.95	Fig. 101
S_1	39876	10.98	30065.31	1034.52	1778.15	0	705.04	2016.3	3170.3	Fig. 84
S_2	31036	50.66	14528.98	2226.37	2586.21	0	2832.59	1647.77	1580.8	Fig. 85
S_3	20781	17.18	15479.27	595.09	742.46	0	290.47	1351.04	1854.78	Fig. 86
Sa_1	81737	7241.95	62730.06	581.63	3806.19	0	656.13	2911.03	428.55	Fig. 21
Sa_2	40006	3771.57	31499.59	203.31	1649.24	0	112.8	1653.5	407.67	Fig. 22
SC_4	19919	1512.8	15548.29	179.49	1059.82	0	277.05	728.9	214.9	Fig. 49

Watershed ID*	Total Area**	Agriculture	Forest	Impervious	Pervious	Peatland	Turf	Wetland	Freshwater	Fig. no.
SC_6	16654	1344.24	12008.83	224.1	1051.74	85.53	331	1168.66	249.25	Fig. 50
SF_1	31986	431.21	25851.11	250.03	466.22	0	33.17	3283.88	1409.75	Fig. 63
SF_2	23944	453.5	19986.45	58.64	642.48	0	73.96	1351.74	1090.46	Fig. 64
Sh_1	255974	19620.64	196398.5	2265.71	6555.6	8.85	2027.64	15056.84	7888.75	Fig. 23
Si_1	90236	871.9	74682.15	358.83	1656.88	0	132.34	5761.46	6399.89	Fig. 24
Si_2	55962	1421.1	46810.02	259.42	1278.3	0	215.35	1992.06	3153.05	Fig. 25
Si_3	7771	373.2	6533.78	46.18	206.2	0	26.24	329.95	129.85	Fig. 26
SM_1	33956	10.3	25933.86	253.72	1466.13	0	325.99	1289.46	3848.87	Fig. 87
SM_2	26232	75.18	21553.77	278.38	764.56	0	157.63	1430.44	1740.2	Fig. 88
SM_3	23526	1.17	19991.44	57.05	638.08	0	91.93	995.79	1772.99	Fig. 89
SMa_1	156330	2137.04	133181.6	204.28	2335.05	0	90.23	13006.17	5292.91	Fig. 65
SW_1	55460	423.67	44970.11	170.02	962.8	37.2	81.97	6954.23	1963.15	Fig. 66
T_1	68015	11.01	54159.45	179.47	763.03	0	126.91	5485.99	7089.5	Fig. 67
T_2	36761	17.6	28416.78	785.2	500.02	0	34.41	3188.01	3828.85	Fig. 68
Tu_1	87917	344.96	70082.7	243.65	1091.95	0	60.3	8431.57	8767.19	Fig. 90
Tu_2	86803	760.44	68471.35	877.45	1775.39	0	194.87	8380.85	7443.64	Fig. 91
Tu_3	21476	1796.61	12359.91	325.63	1199.83	0	536.61	2746.5	1125.84	Fig. 92
Tu_4	12236	84.34	8550.14	64.87	241.68	0	33.89	2180.2	907.8	Fig. 93
Vi_1	85750	167.62	69720.64	2357.43	775.72	0	178.96	10529.89	1506.36	Fig. 95
Vi_2	42245	43.4	32801.75	121.05	683.26	0	11.91	6398.98	2031.19	Fig. 96
Vi_3	40238	79.93	36078.79	104.77	704.03	0	8.77	2677.51	356.74	Fig. 97
Vi_4	13181	9.56	11531.33	13.02	114.82	0	7.39	1257.42	204.09	Fig. 98

** Watershed IDs from the Cape Breton Island sub-region have been changed from those used in Kelly et al., (2021). See Appendix for details.*

*** Due to variations in spatial resolution among datasets, the total area of each watershed may be slightly lower or higher than the sum of its components.*

FIGURES



Bay of Fundy

Label / Watershed ID		
1 / A_1	17 / M_04	33 / P_2
2 / A_2	18 / M_05	34 / P_3
3 / Av_1	19 / M_06	35 / P_4
4 / E_1	20 / M_07	36 / Ph_1
5 / E_2	21 / M_08	37 / Ph_2
6 / Ga_1	22 / M_09	38 / Ph_3
7 / Ga_2	23 / M_10	39 / SC_4
8 / Ga_3	24 / M_11	40 / SC_6
9 / K_1	25 / Met_1	41 / Sa_1
10 / K_2	26 / PW_1	42 / Sa_2
11 / K_3	27 / PW_2	43 / Sh_1
12 / LK_1	28 / PW_3	44 / Si_1
13 / M-P_1	29 / PW_4	45 / Si_2
14 / M_01	30 / PW_5	46 / Si_3
15 / M_02	31 / PW_6	
16 / M_03	32 / P_1	

Western

Label / Watershed ID	
47 / Cl_1	63 / SM_3
48 / Cl_2	64 / S_1
49 / G_1	65 / S_2
50 / G_2	66 / S_3
51 / G_3	67 / Tu_1
52 / La_1	68 / Tu_2
53 / Med_1	69 / Tu_3
54 / Med_2	70 / Tu_4
55 / Mer_1	
56 / Mer_2	
57 / Mer_3	
58 / Met_2	
59 / R_1	
60 / R_2	
61 / SM_1	
62 / SM_2	

Eastern

Label / Watershed ID	
71 / EW_1	87 / T_2
72 / EW_2	
73 / L_1	
74 / L_2	
75 / L_3	
76 / Mus_1	
77 / Mus_2	
78 / Mus_3	
79 / NH_1	
80 / NH_2	
81 / NH_3	
82 / SF_1	
83 / SF_2	
84 / SMa_1	
85 / SW_1	
86 / T_1	

Cape Breton Island

Label / Watershed ID	
88 / Vi_1	104 / Br_3
89 / Vi_2	105 / Br_10
90 / Vi_3	106 / Br_5
91 / Vi_4	107 / Br_11
92 / Ri_1	108 / Br_8
93 / Ri_3	109 / Ri_2
94 / Br_1	
95 / Br_2	
96 / Br_4	
97 / Br_6	
98 / Ca_1	
99 / Ca_2	
100 / Ca_4	
101 / Br_8	
102 / Br_7	
103 / Ca_3	

Figure 1. Map of 109 coastal watersheds in the Maritimes Region, separated into four sub-regions.

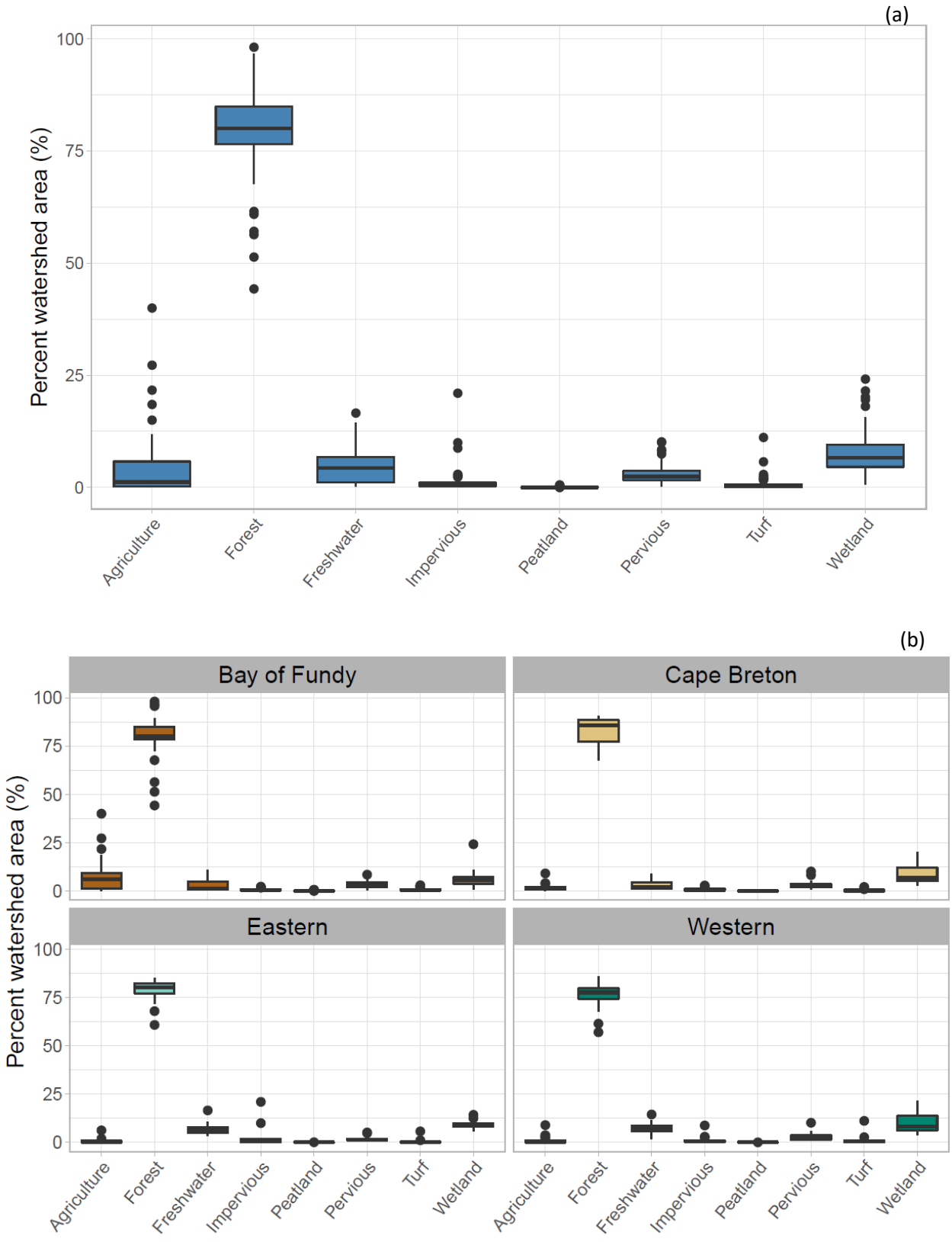


Figure 2. The percent contribution to total watershed area across land cover types for (a) all watersheds, and (b) all watersheds within each sub-region.

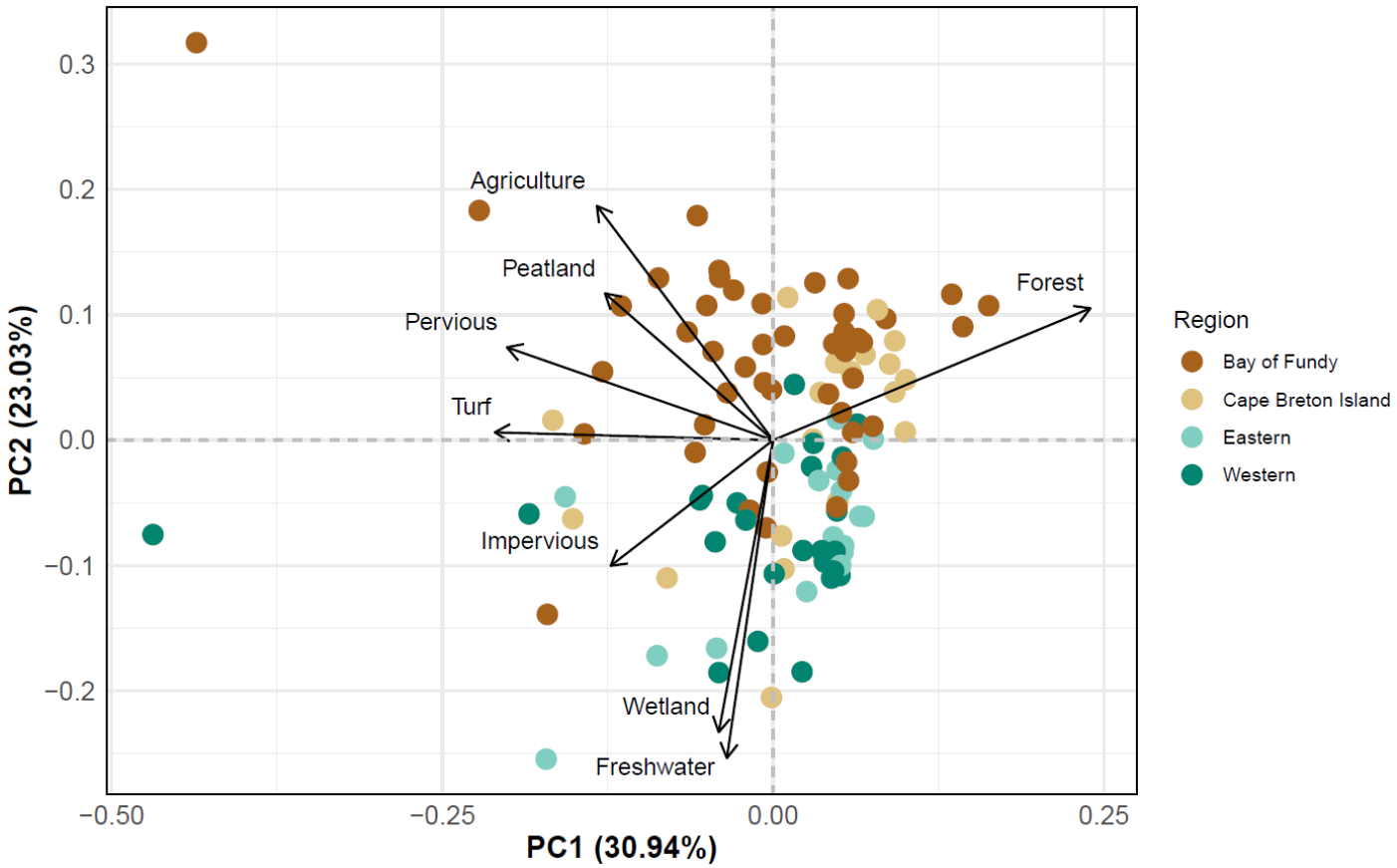


Figure 3. PCA biplot of percentage land use cover in 109 coastal watersheds.

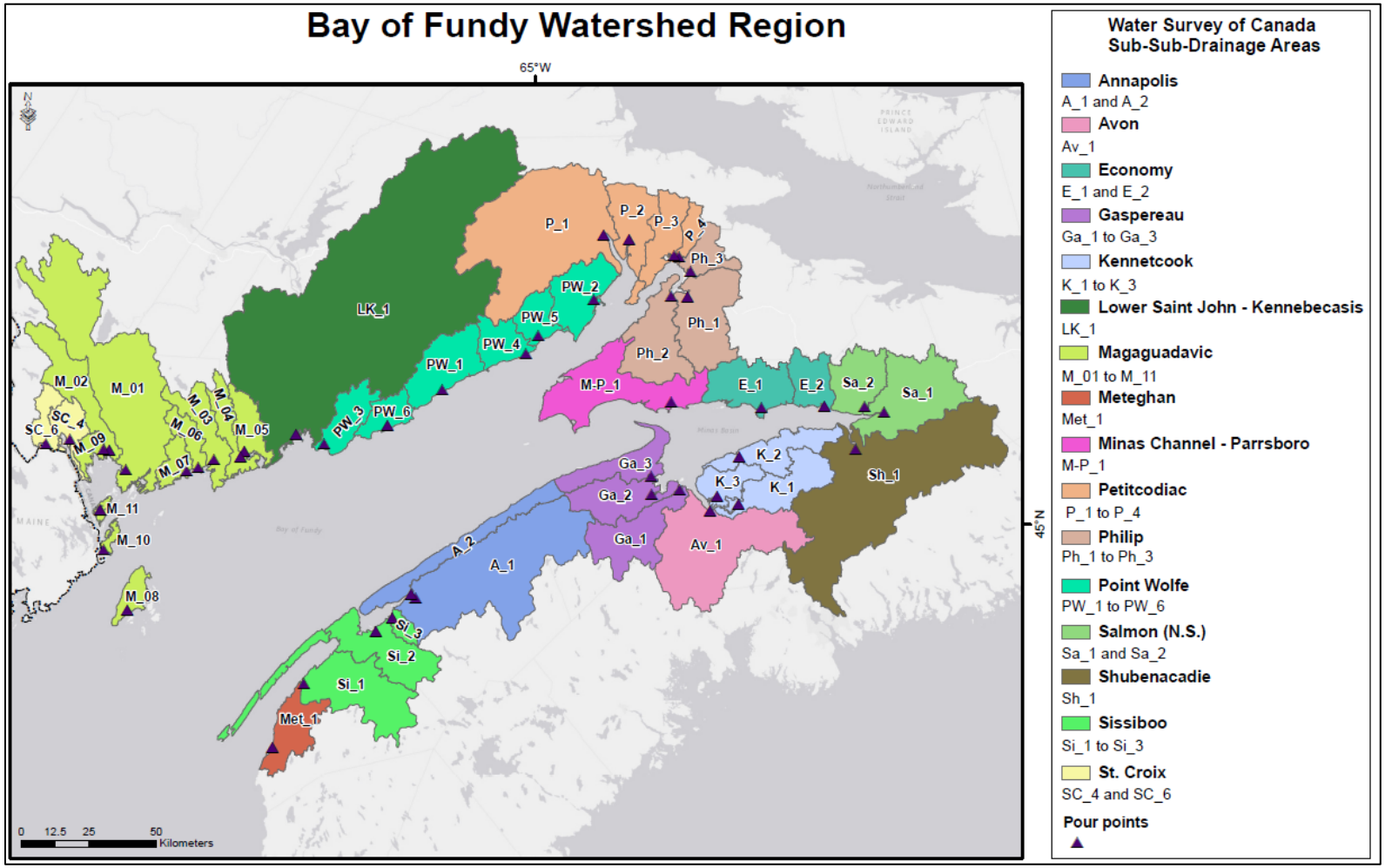


Figure 4. Bay of Fundy sub-region, displaying sixteen Water Survey of Canada sub-sub-drainage areas (denoted by differing colours) and their associated watersheds. Black triangles represent the major pour points (largest outlets into the coastal zone).

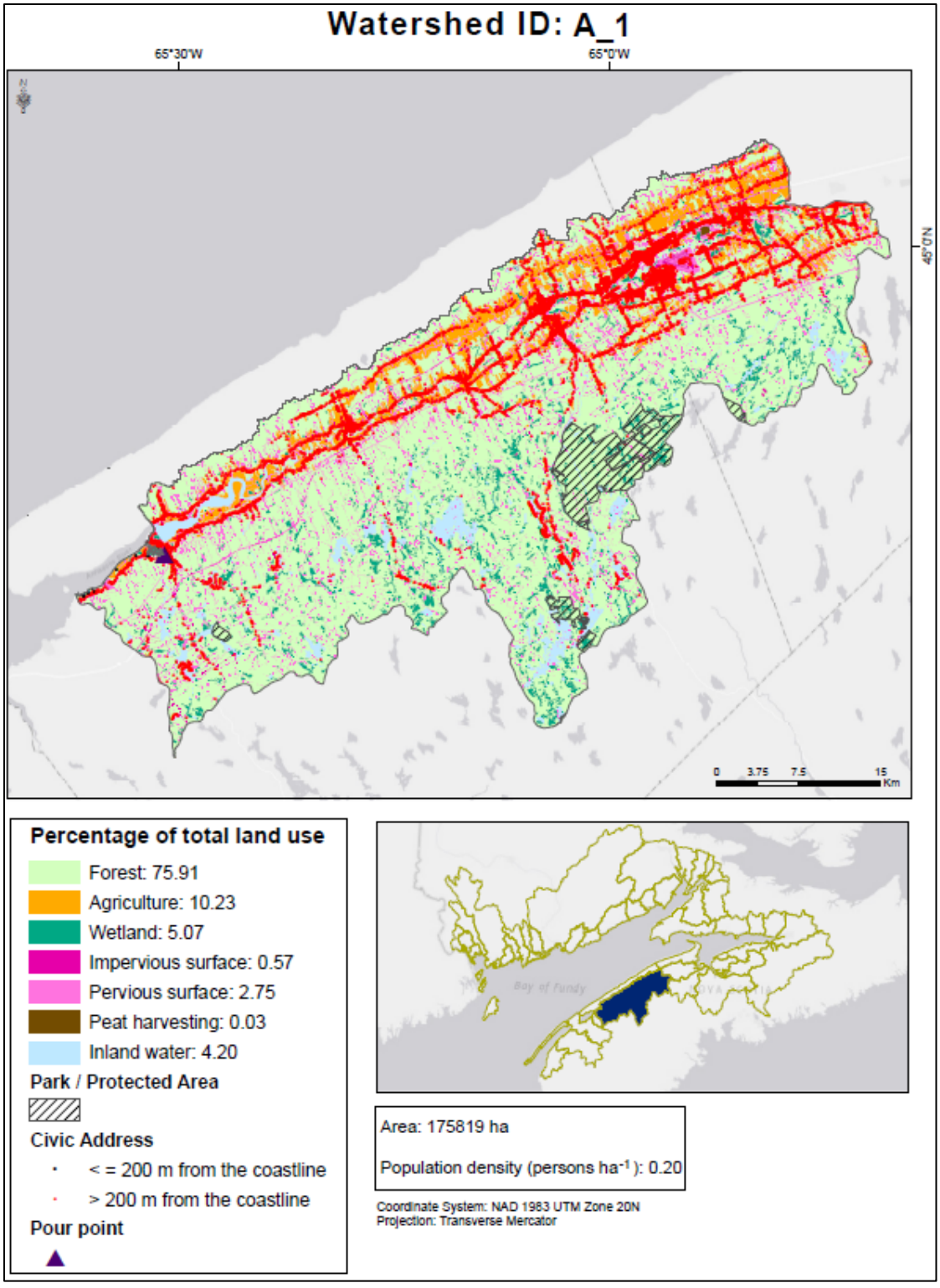


Figure 5. Land-use map for Annapolis watershed A_1. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

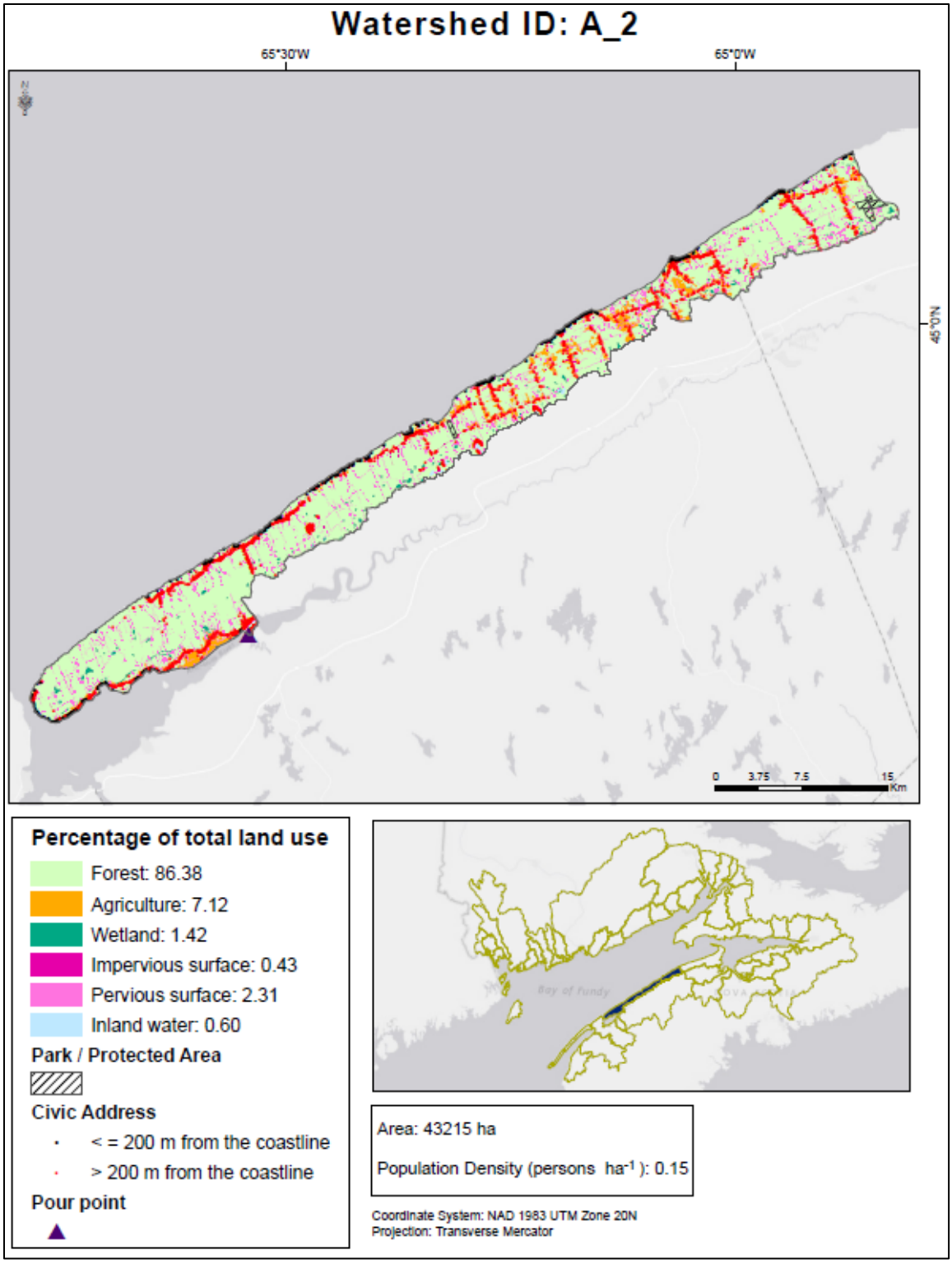


Figure 6. Land-use map for Annapolis watershed A_2. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

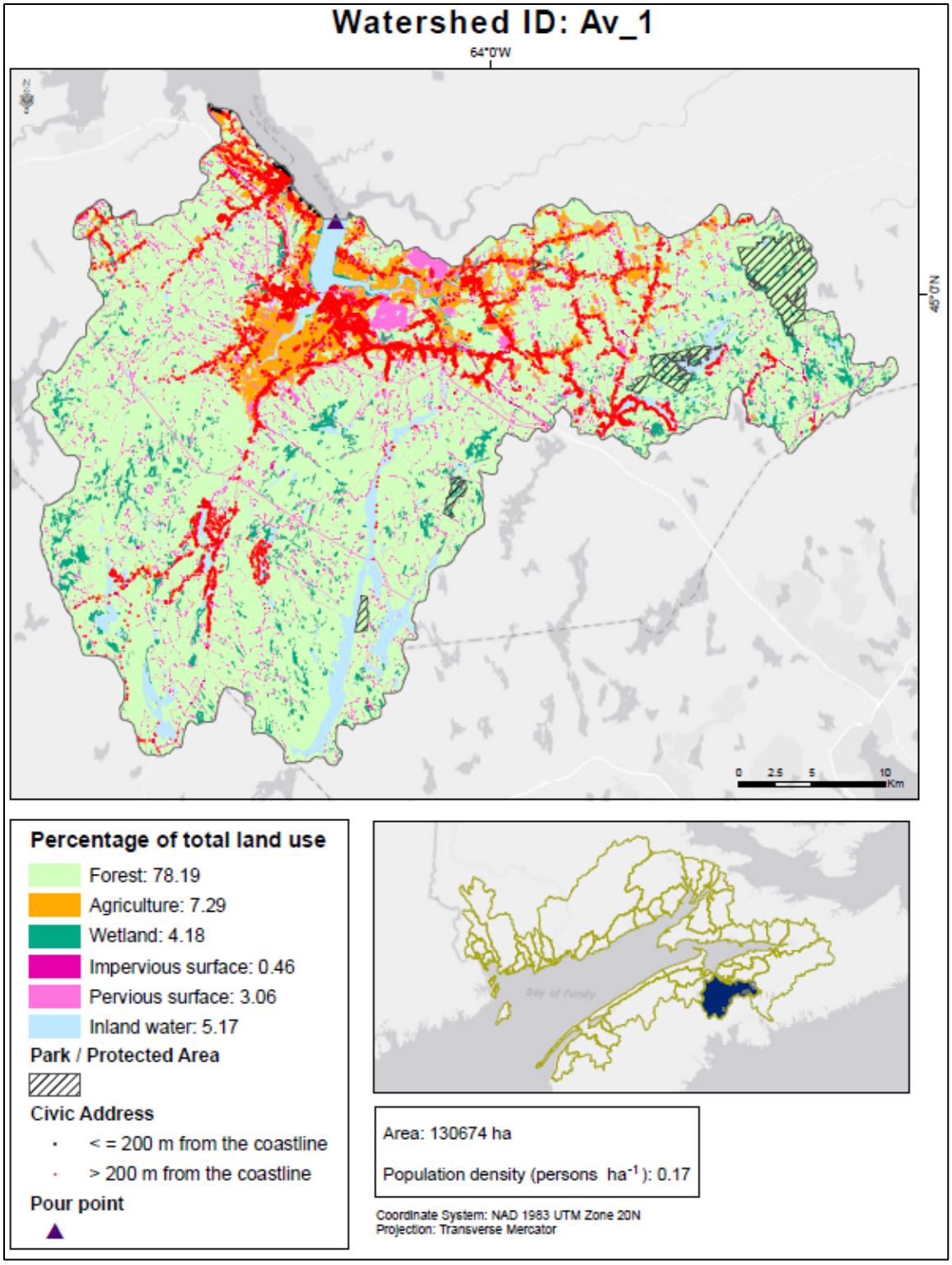


Figure 7. Land-use map for Avon watershed Av_1. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

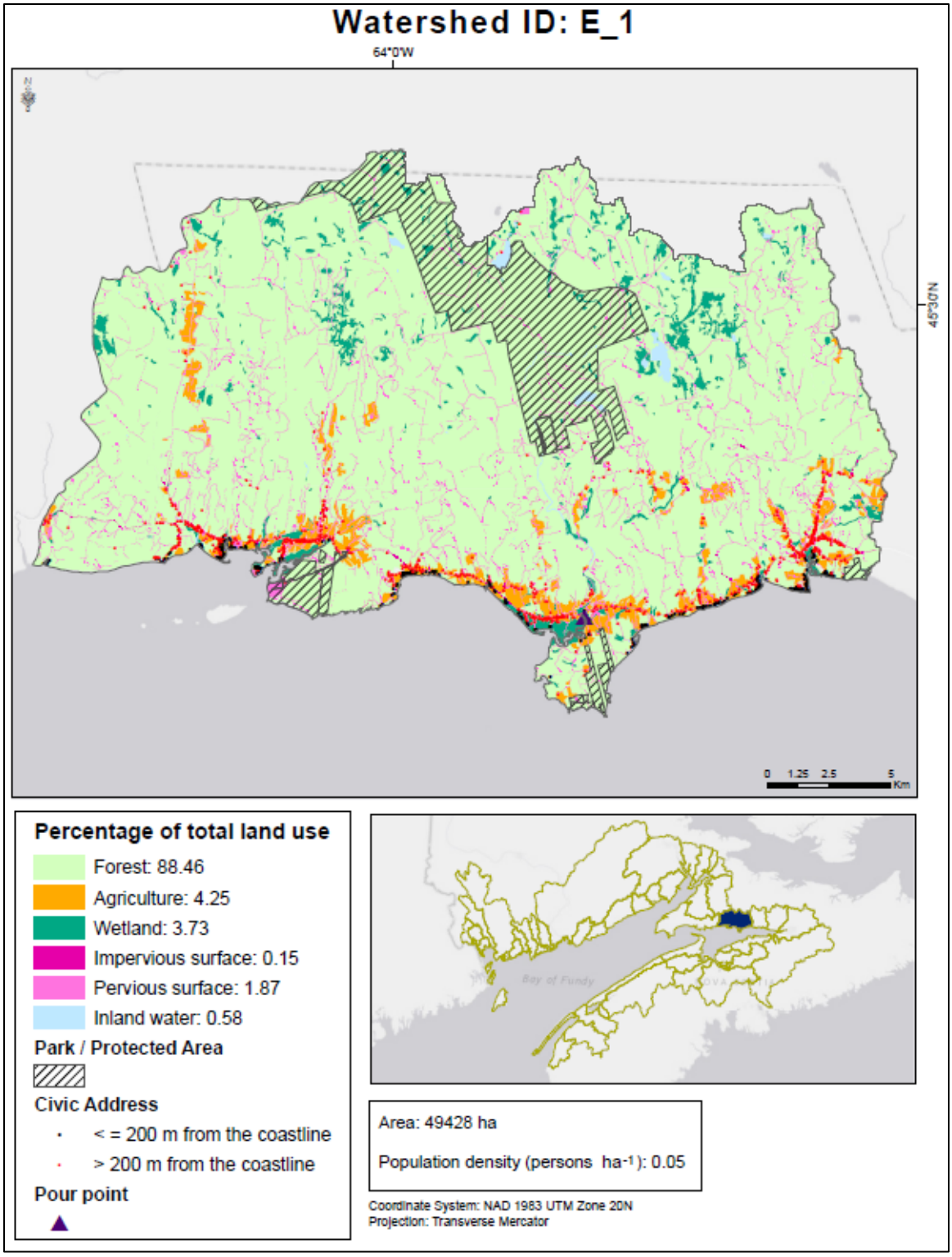


Figure 8. Land-use map for Economy watershed E_1. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

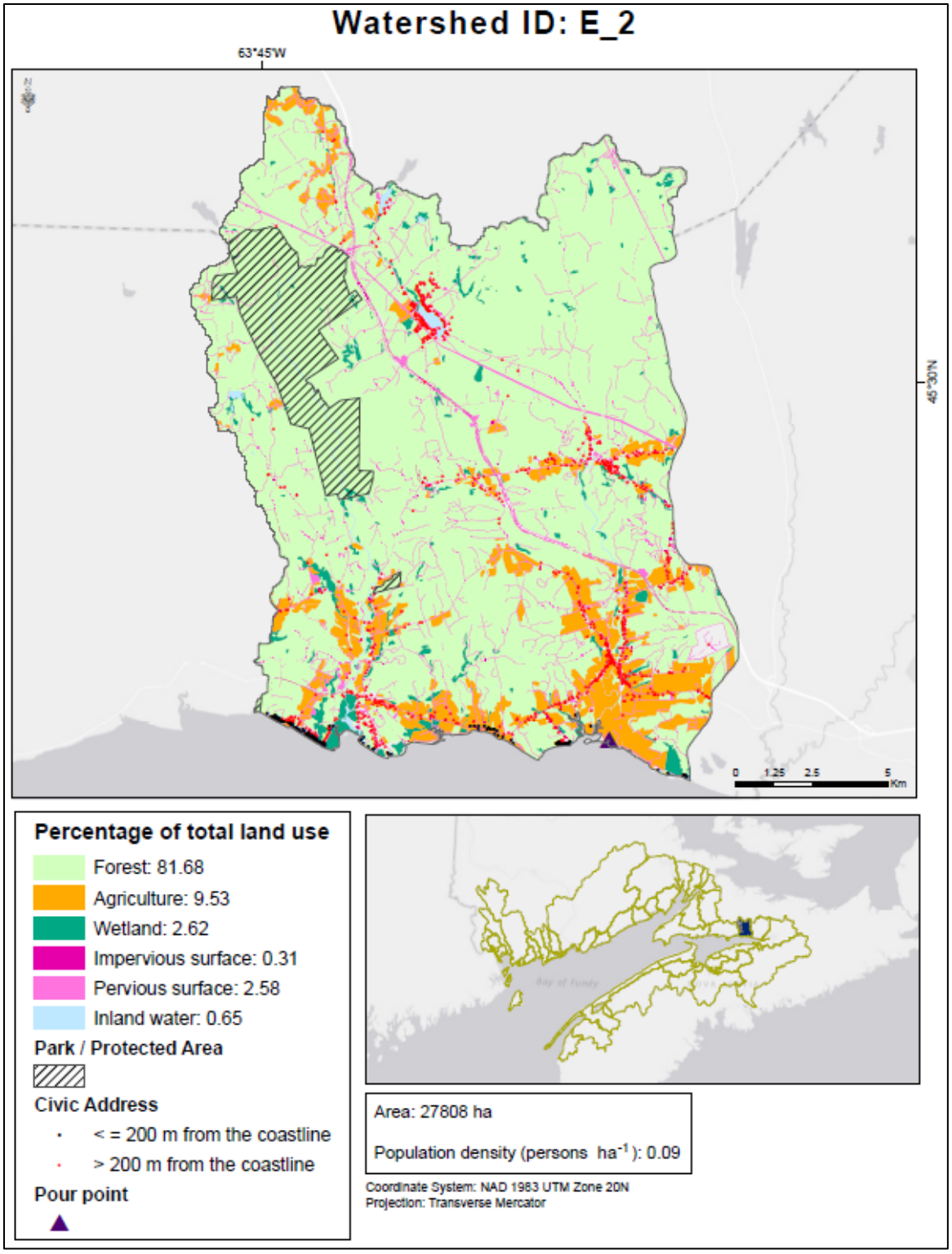


Figure 9 . Land-use map for Economy watershed E_2. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

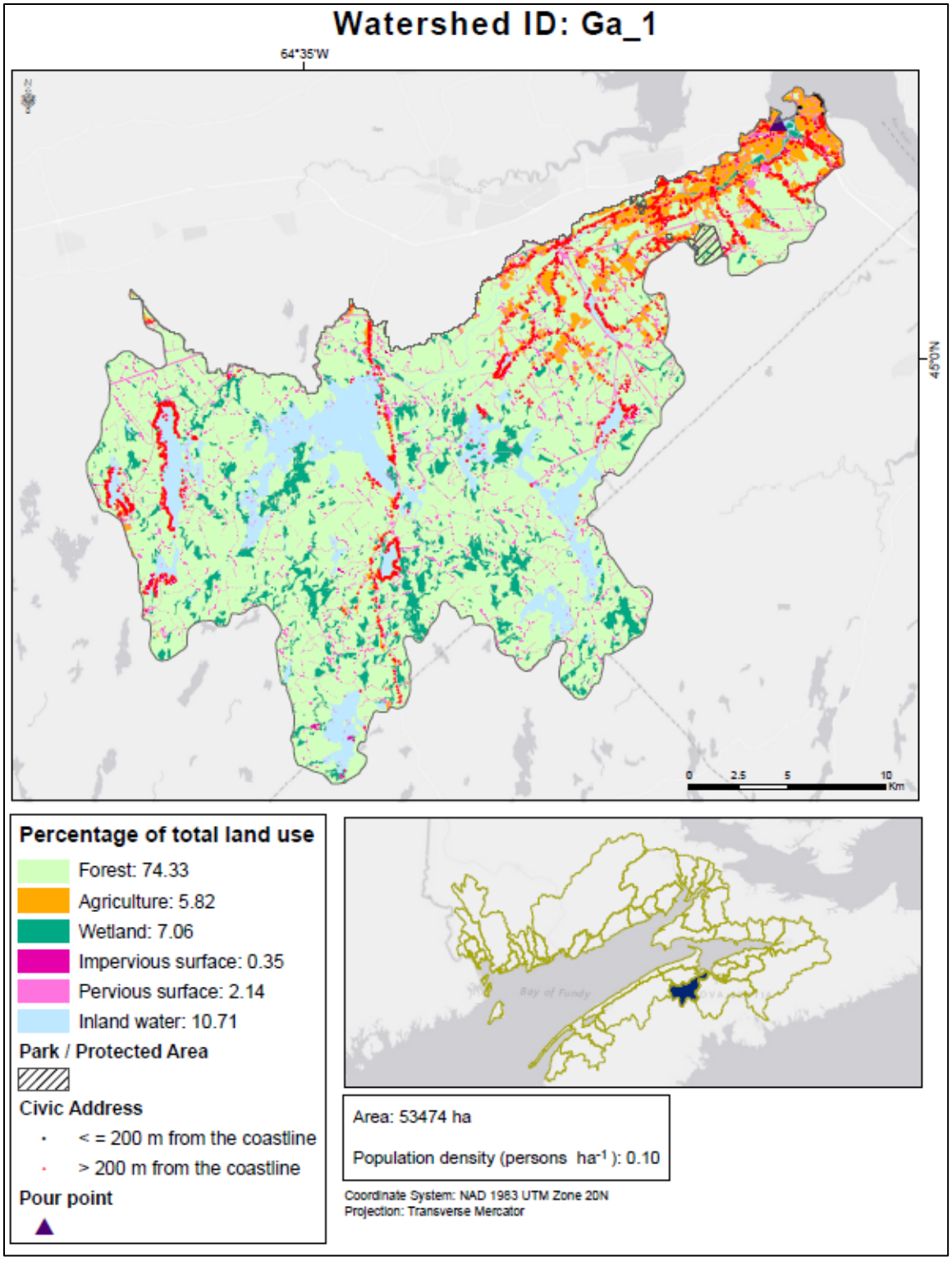


Figure 10. Land-use map for Gaspereau watershed Ga_1. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

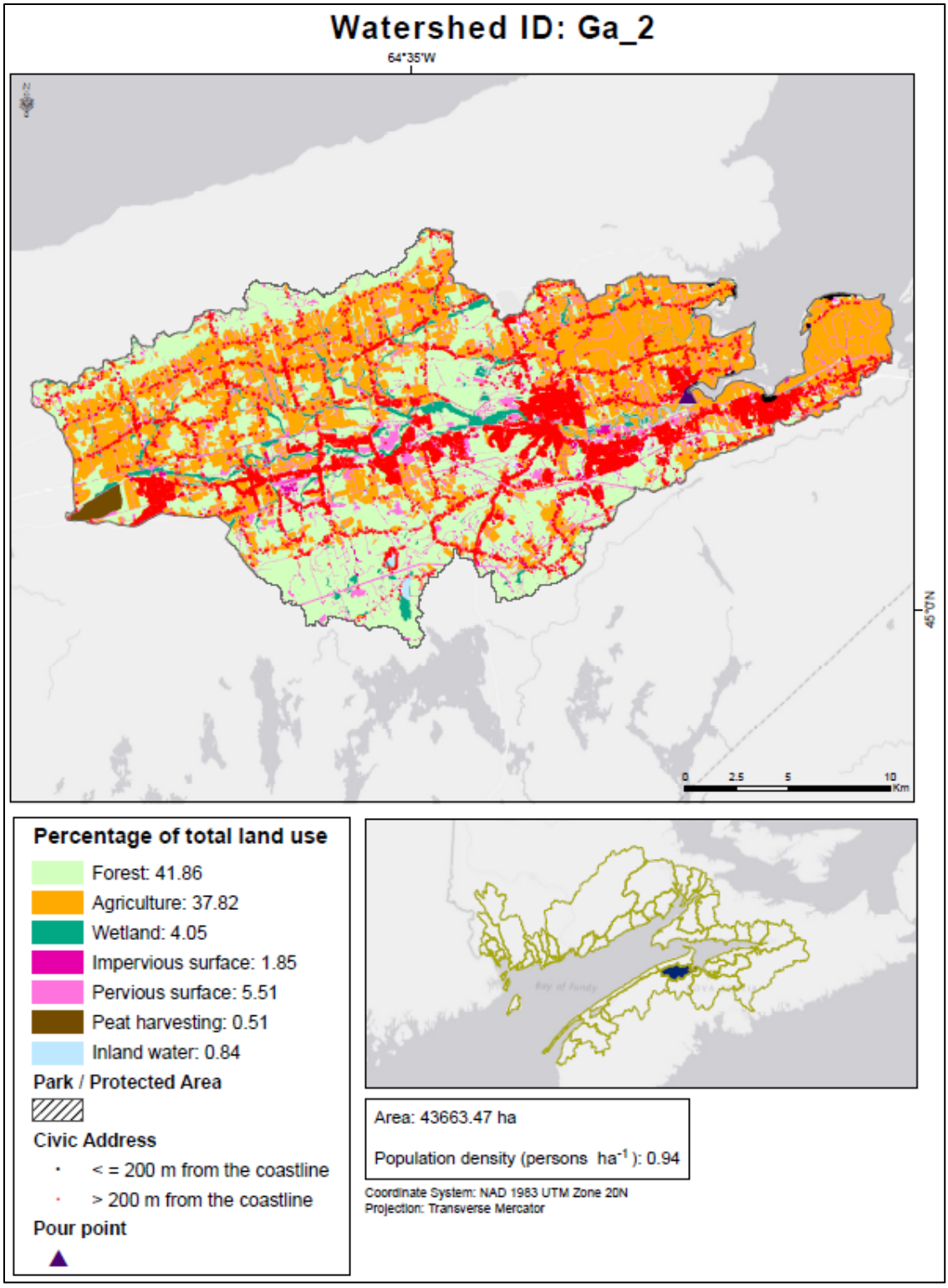


Figure 11. Land-use map for Gaspereau watershed Ga_2. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

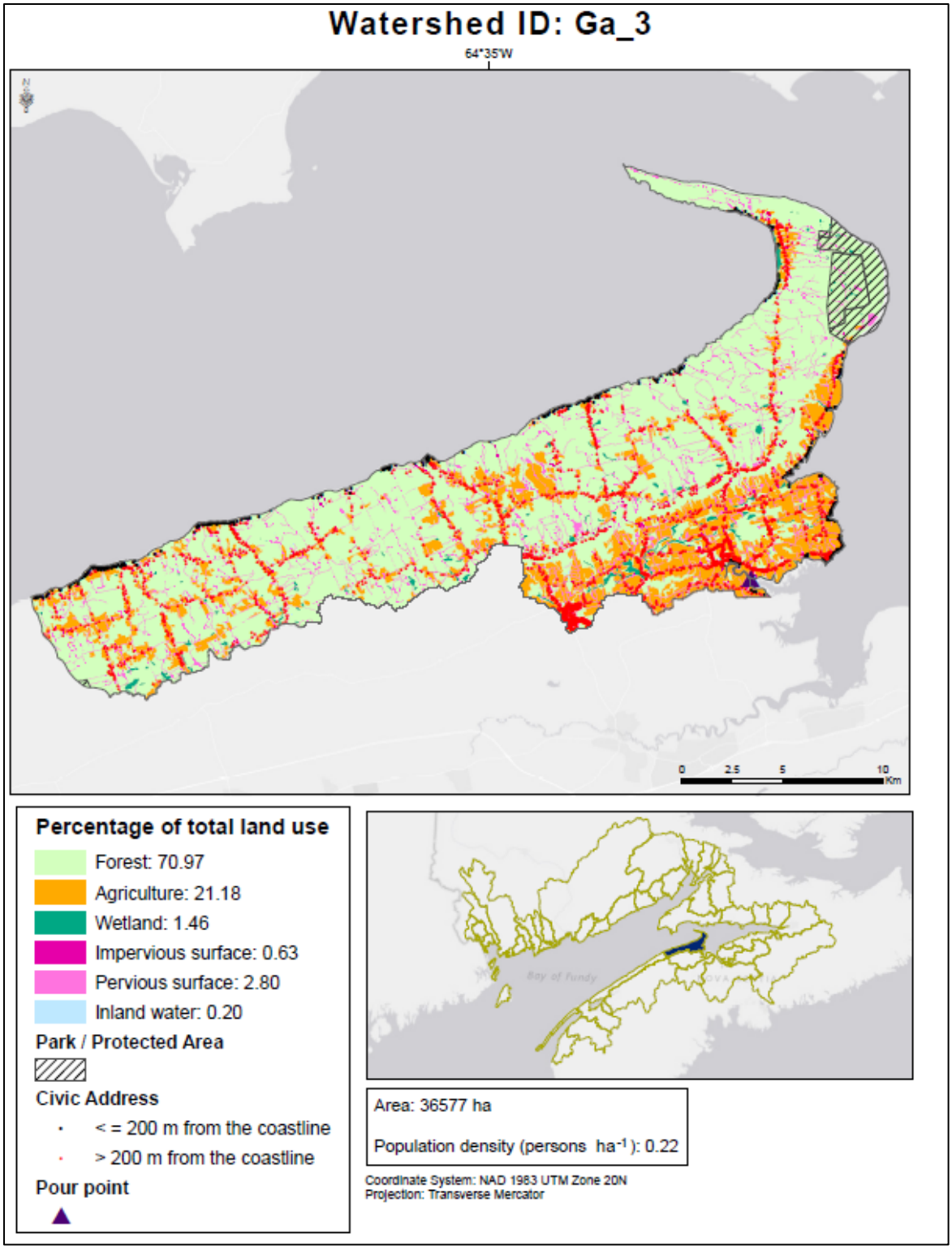


Figure 12. Land-use map for Gaspereau watershed Ga_3. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

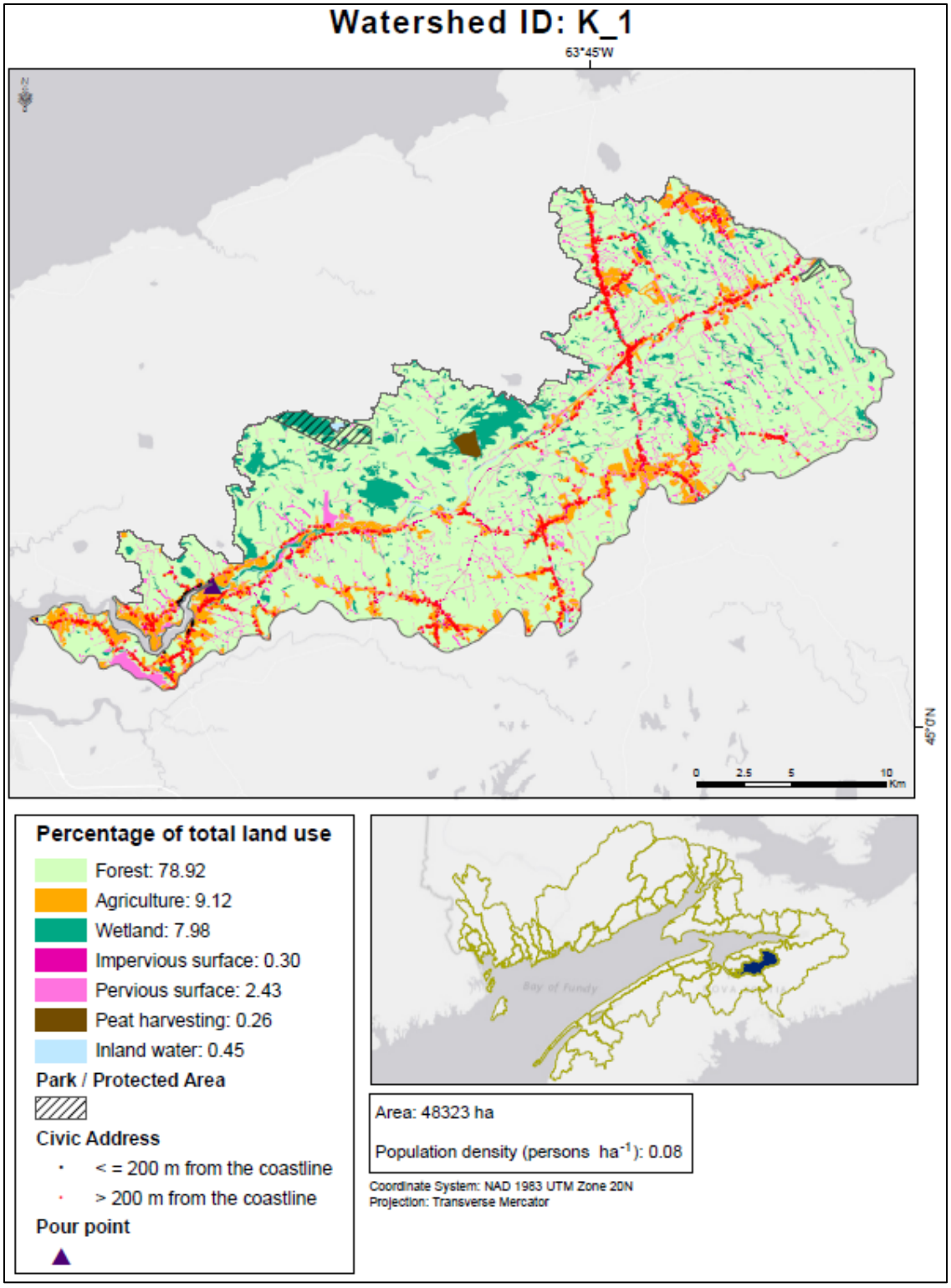


Figure 13. Land-use map for Kennetcook watershed K_1. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

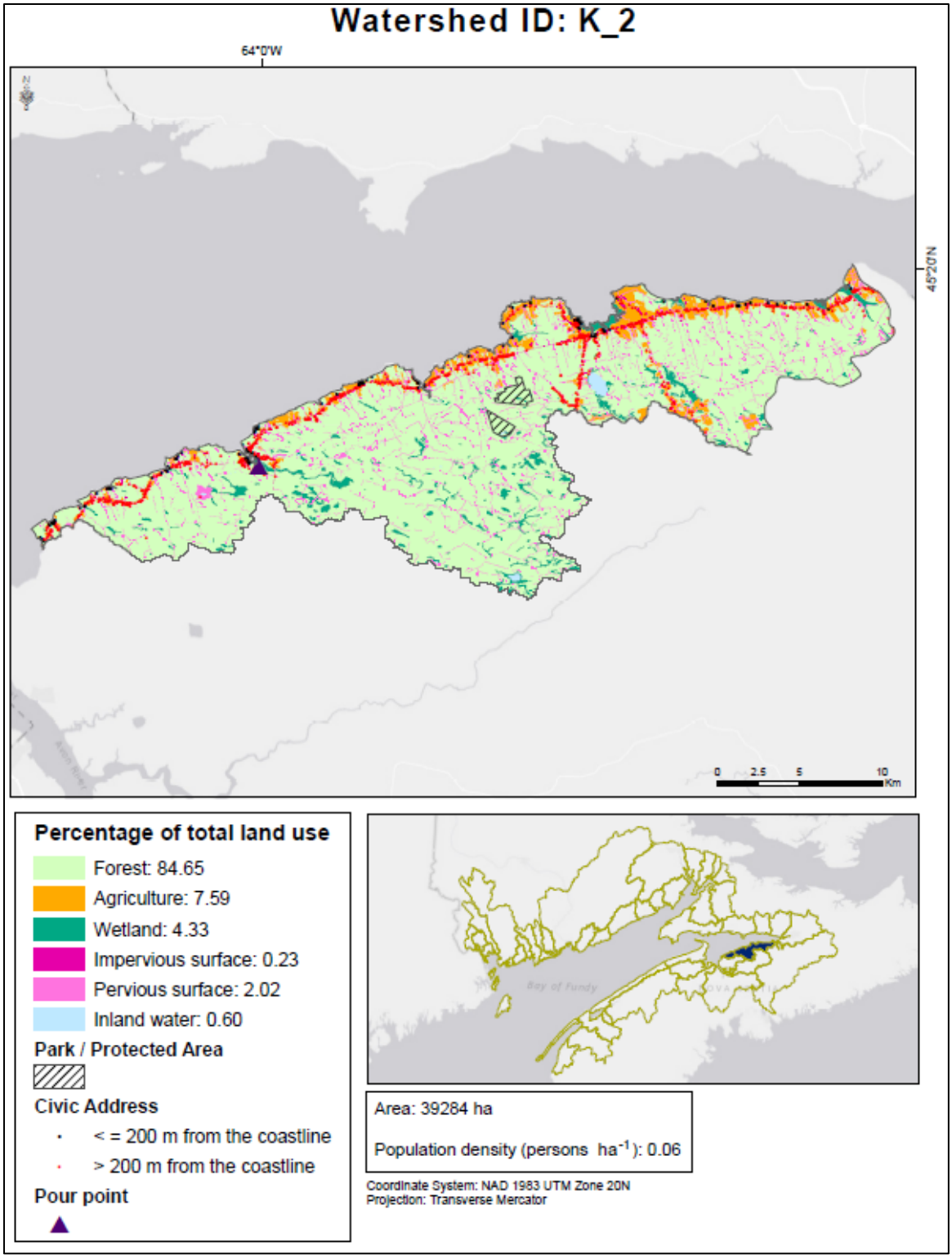


Figure 14. Land-use map for Kennetcook watershed K_2. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

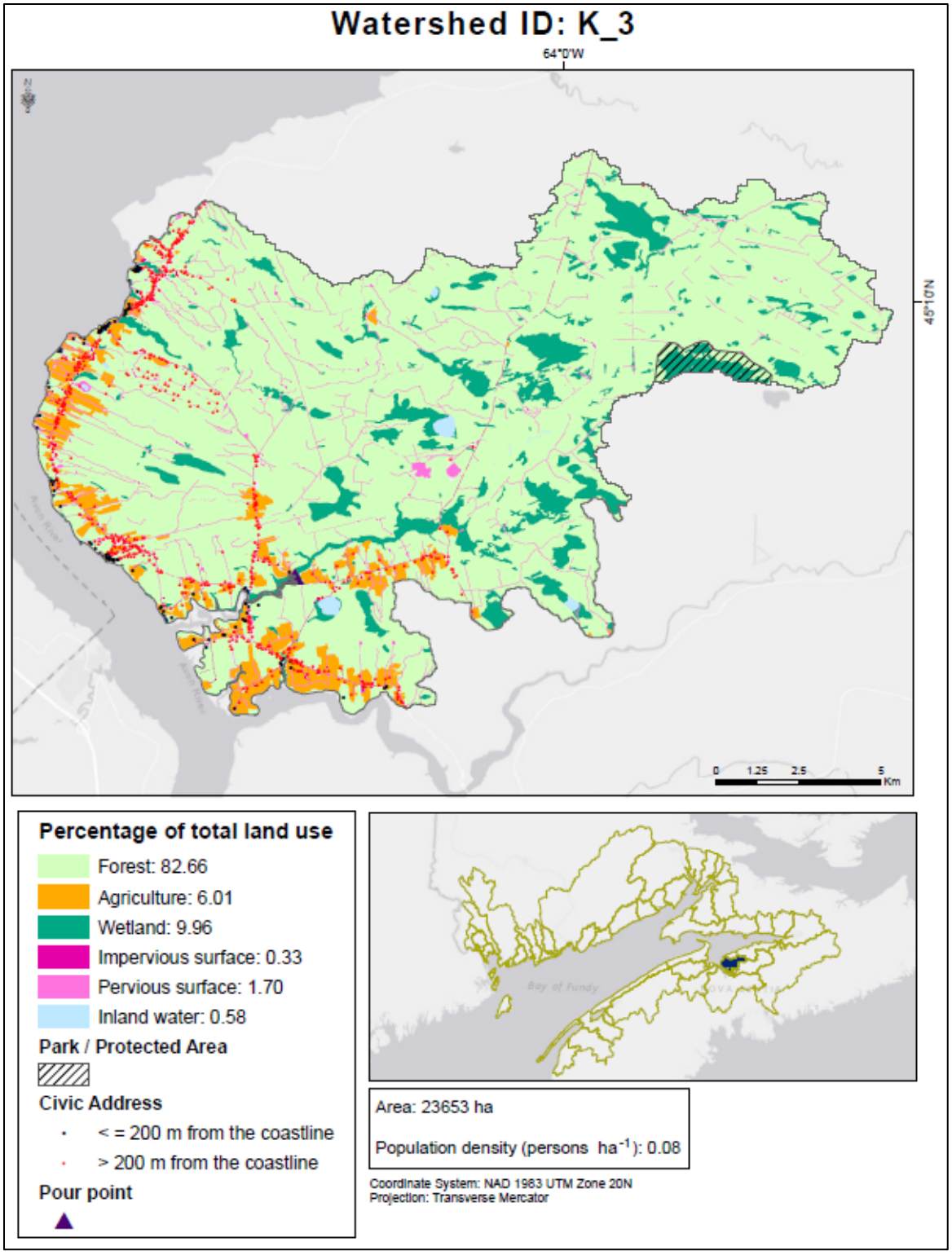


Figure 15. Land-use map for Kennetcook watershed K_3. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

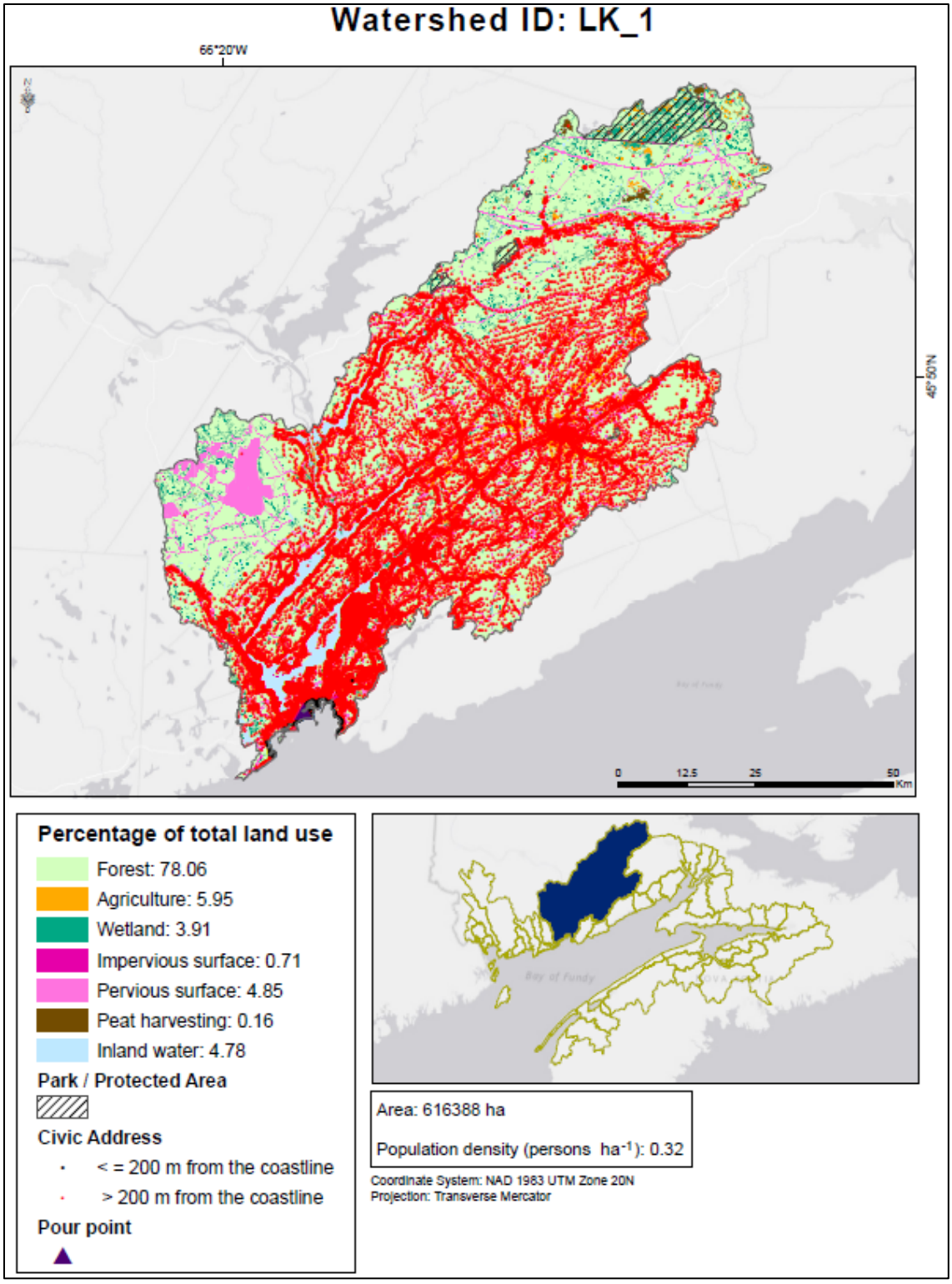


Figure 16. Land-use map for Lower Saint John - Kennebecasis watershed LK_1. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

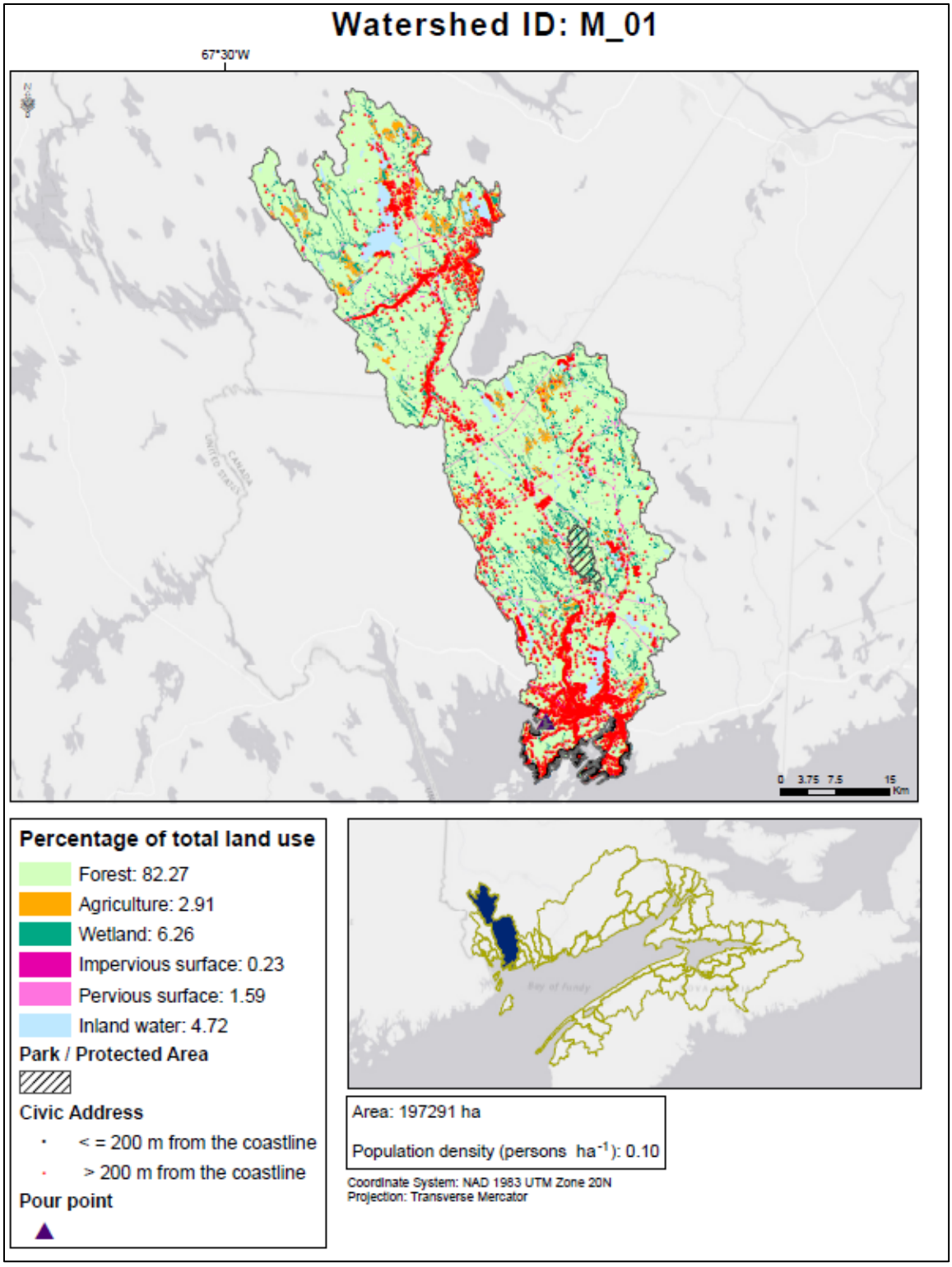


Figure 17. Land-use map for Magaguadavic watershed M_01. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

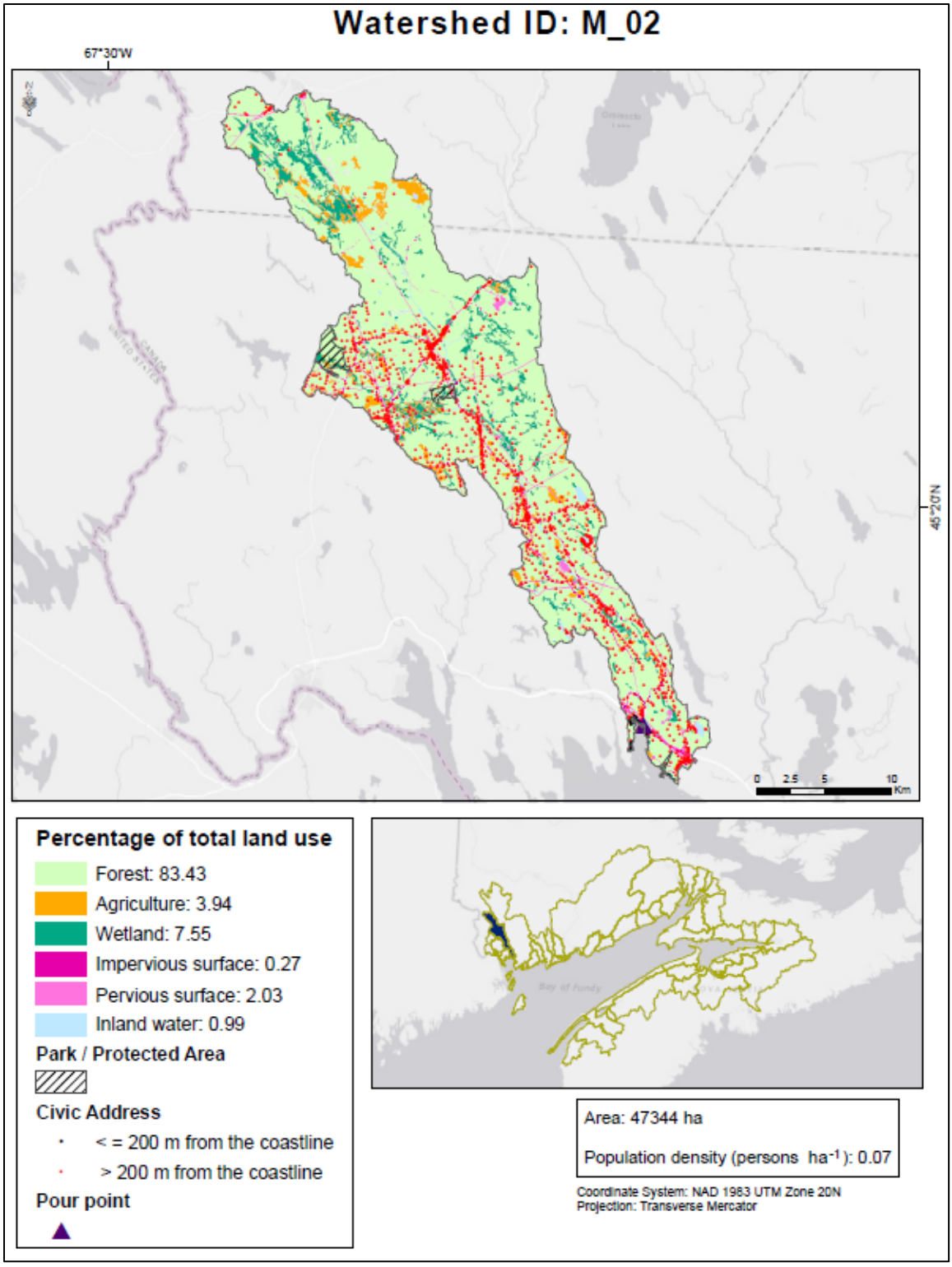


Figure 18. Land-use map for Magaguadavic watershed M_02. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

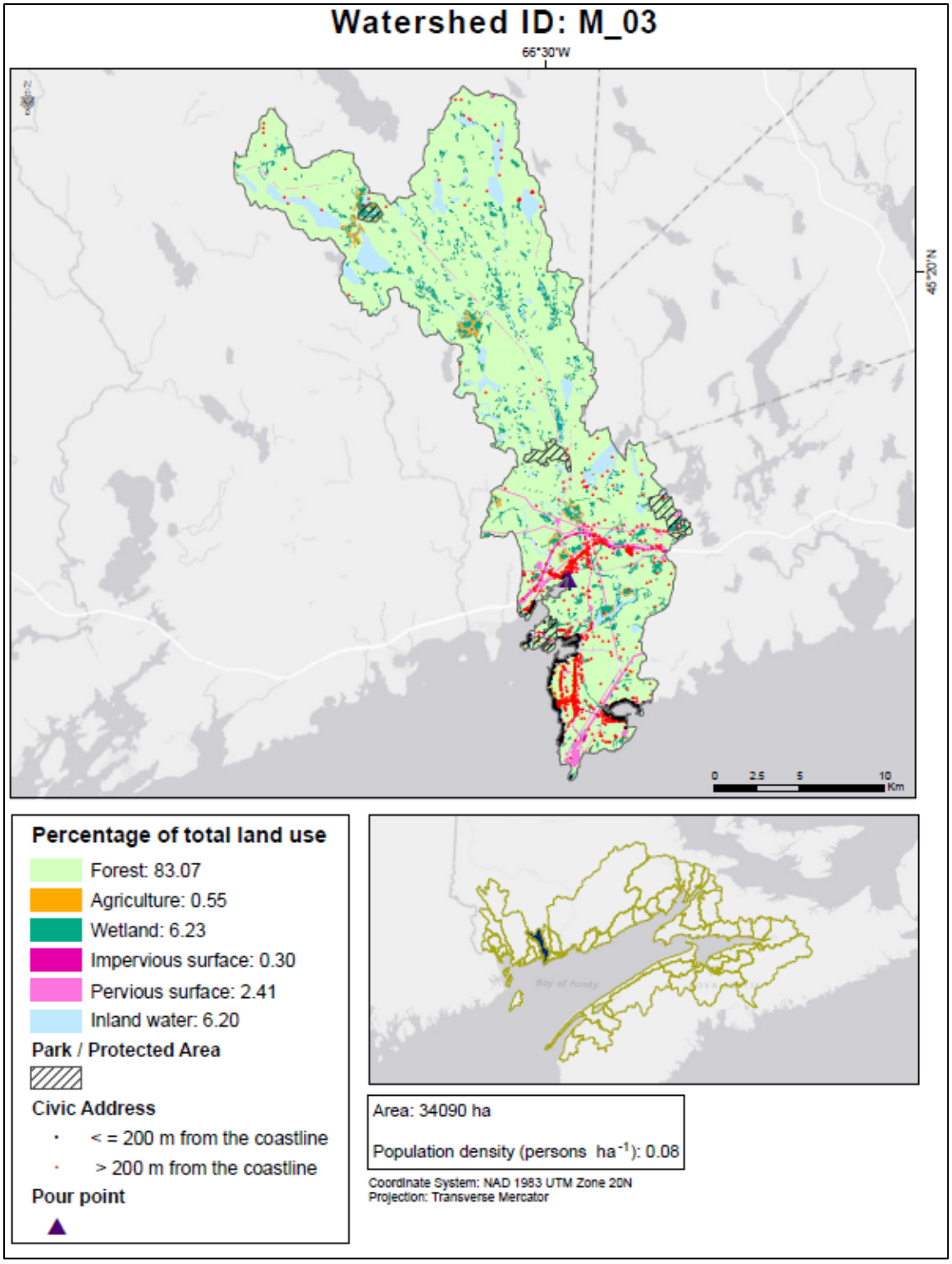


Figure 19. Land-use map for Magaguadavic watershed M_03. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

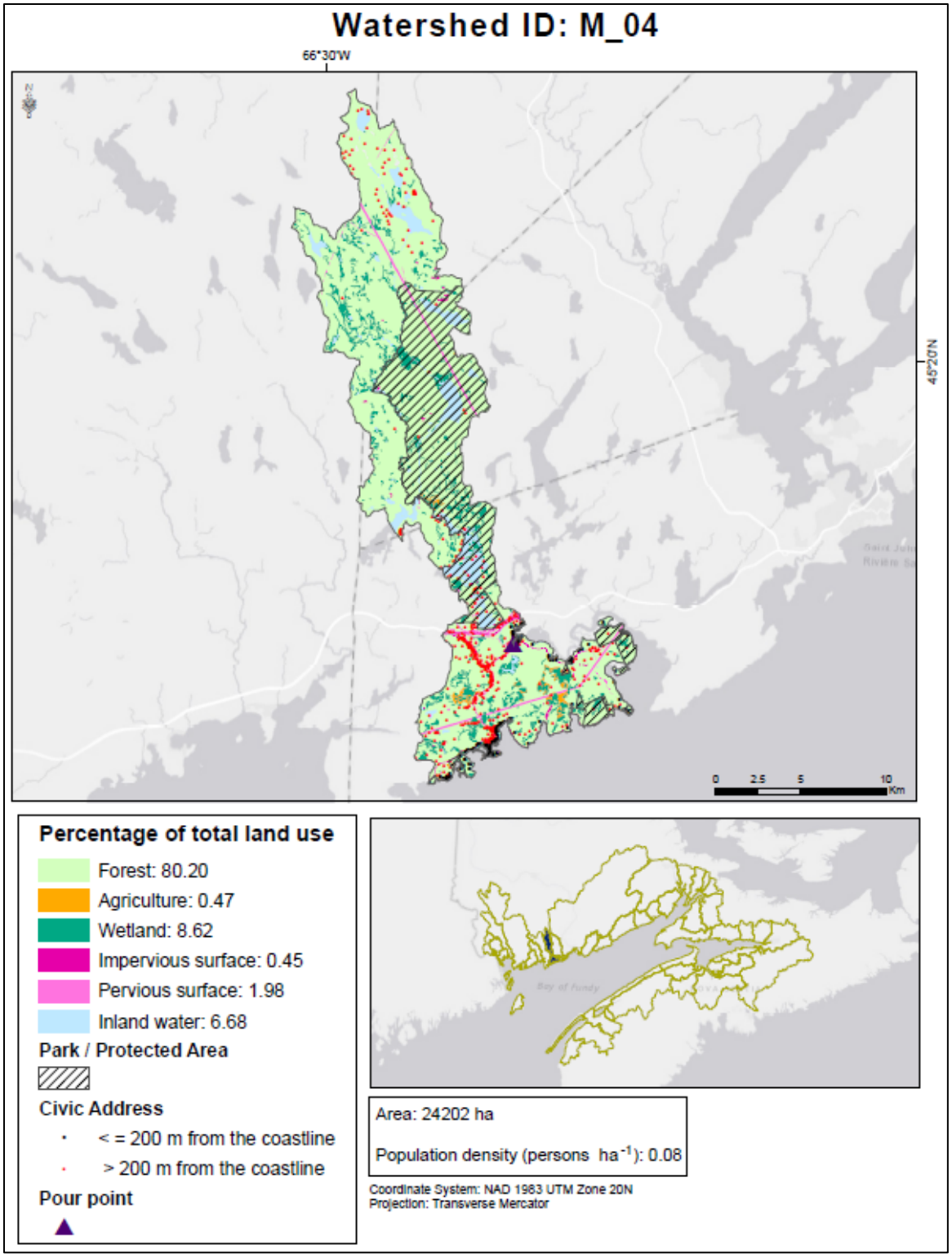


Figure 20. Land-use map for Magaguadavic watershed M_04. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

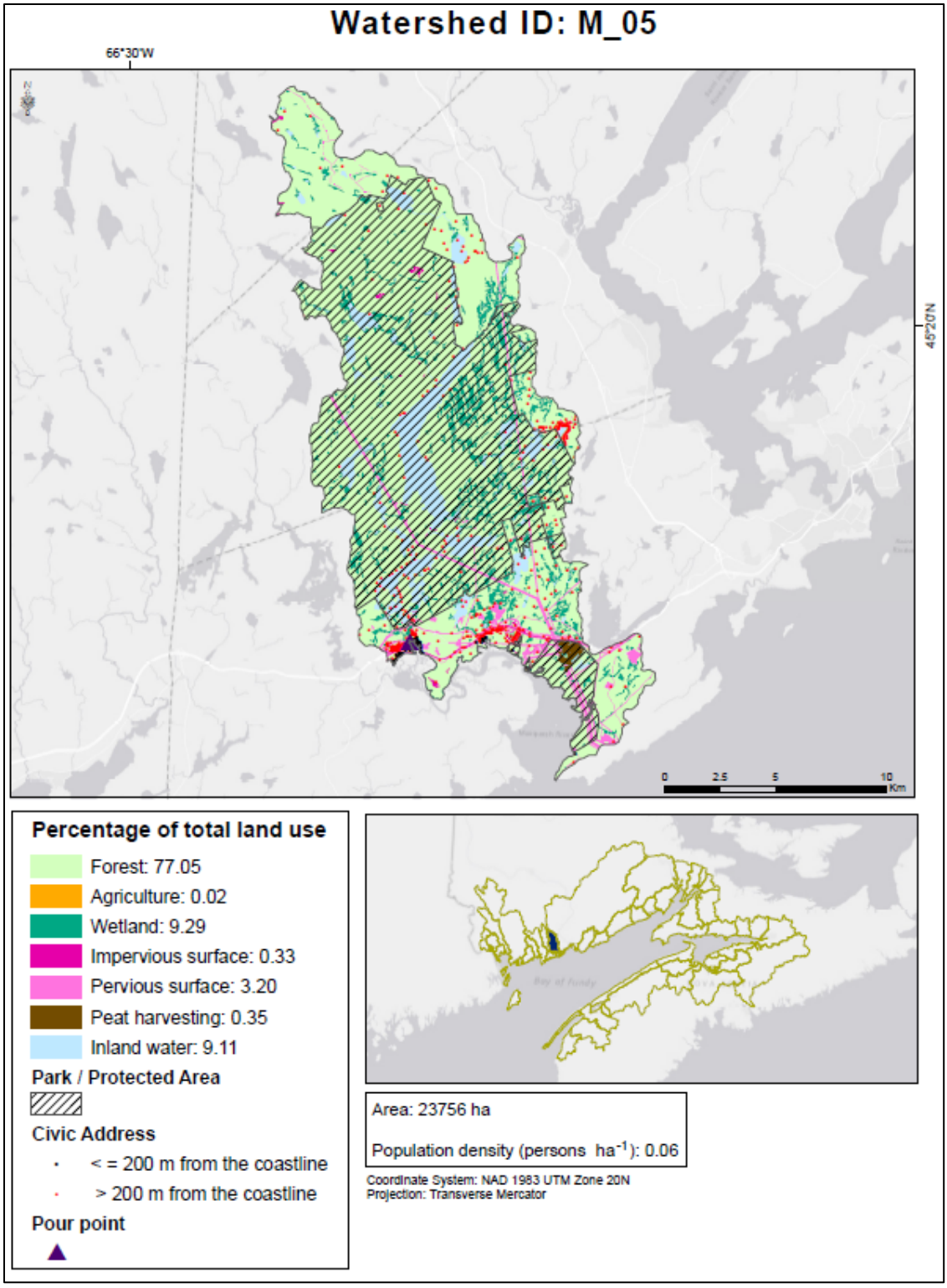


Figure 21. Land-use map for Magaguadavic watershed M_05. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

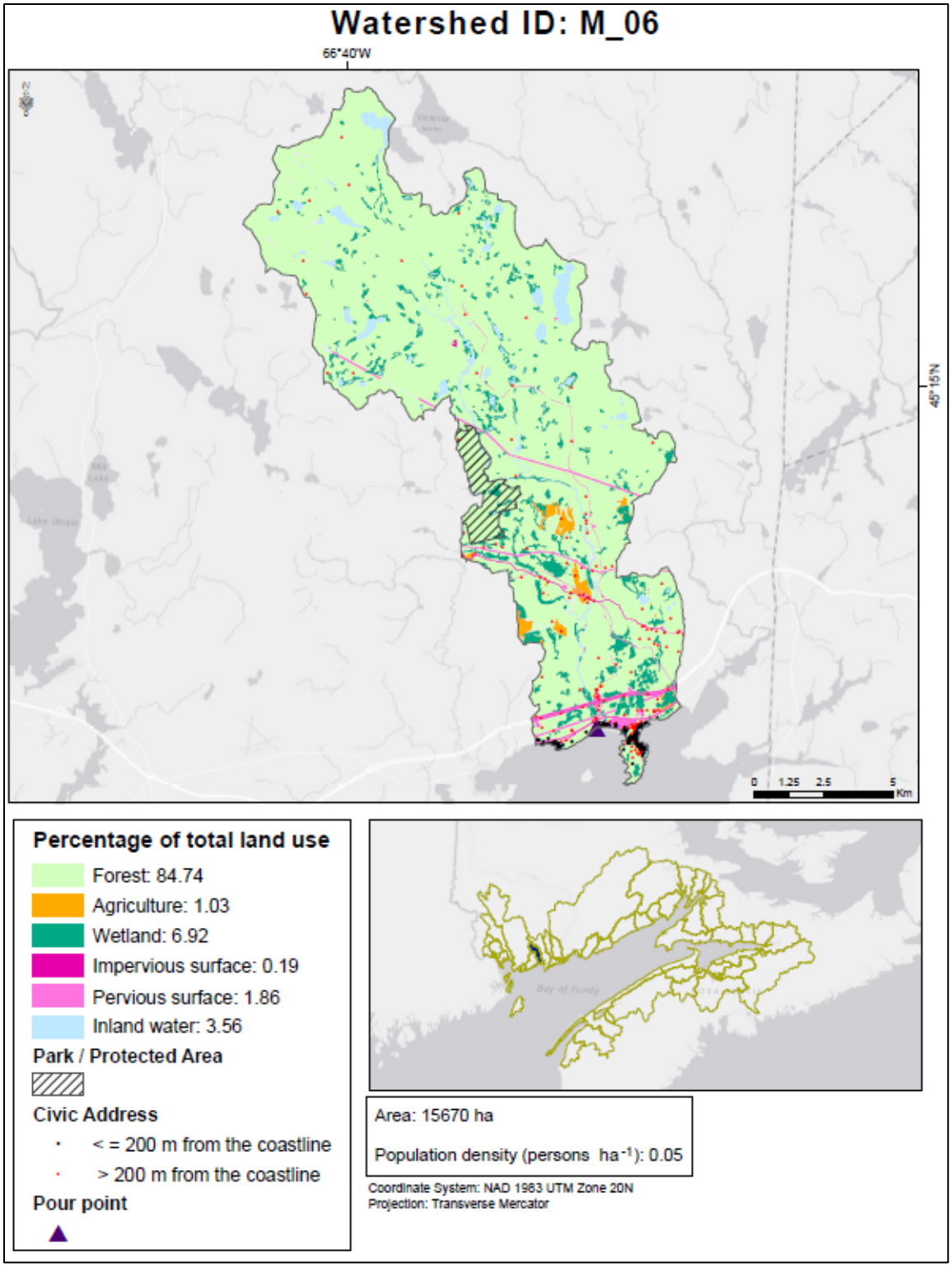


Figure 22. Land-use map for Magaguadavic watershed M_06. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

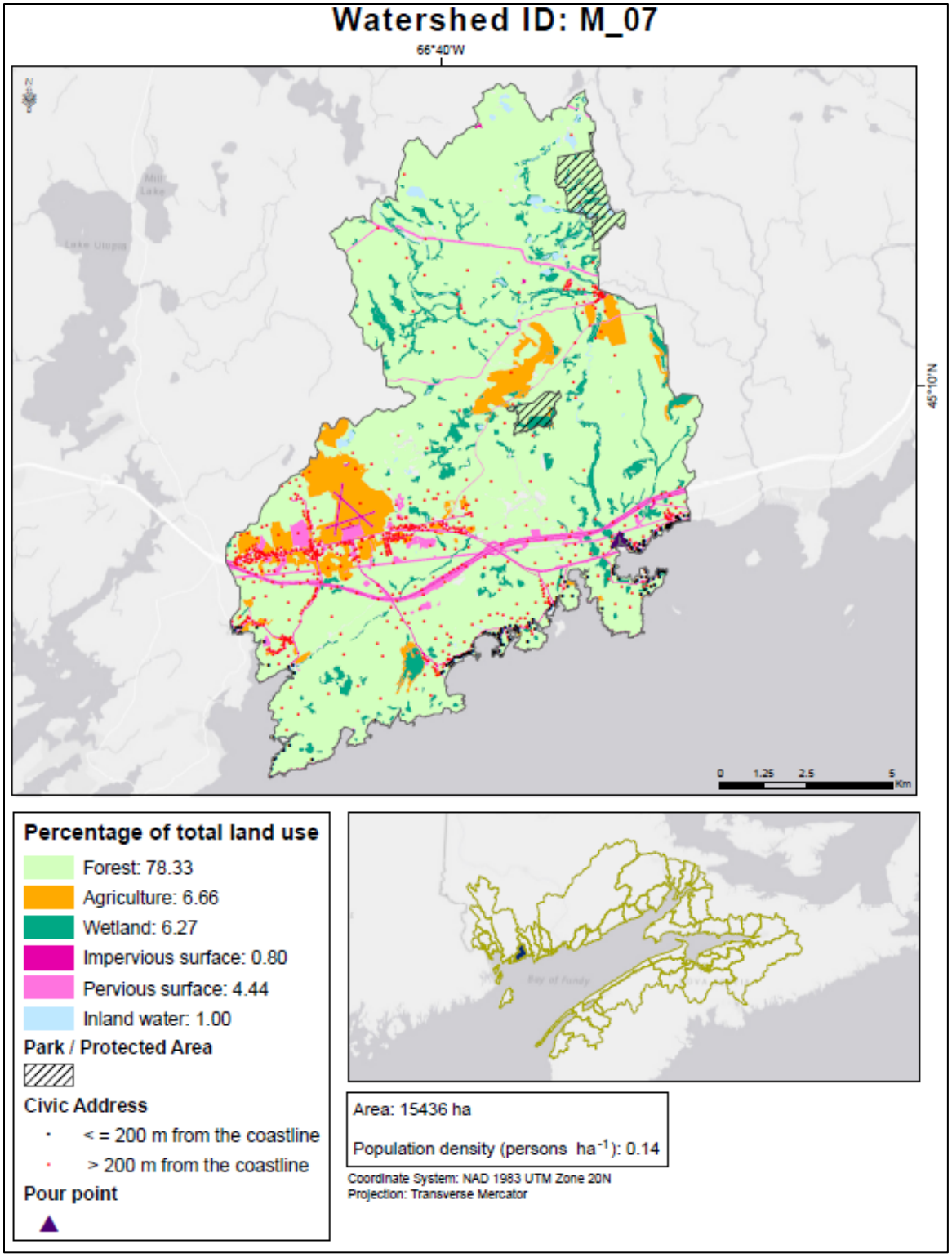


Figure 23. Land-use map for Magaguadavic watershed M_07. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

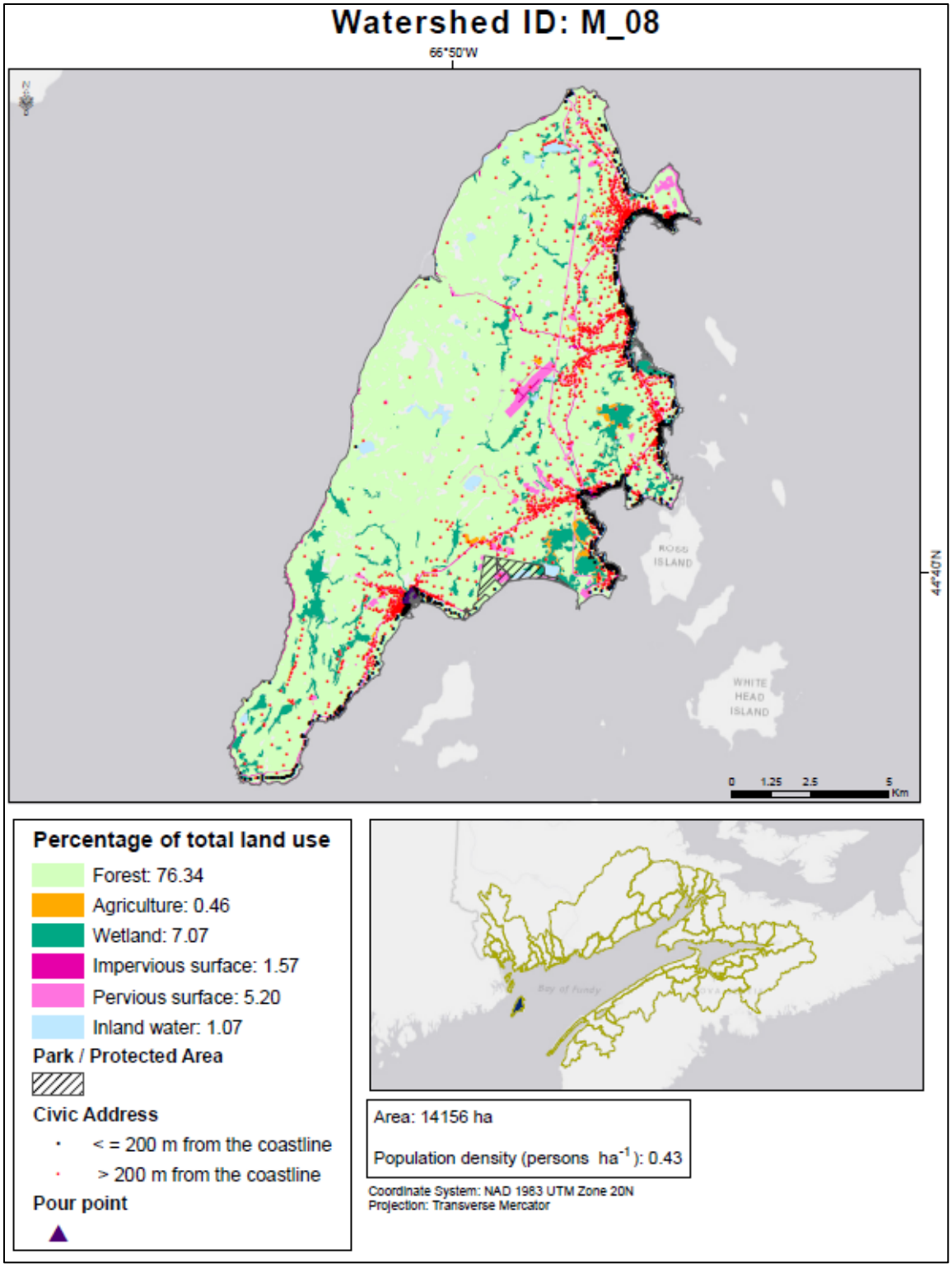


Figure 24. Land-use map for Magaguadavic watershed M_08. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

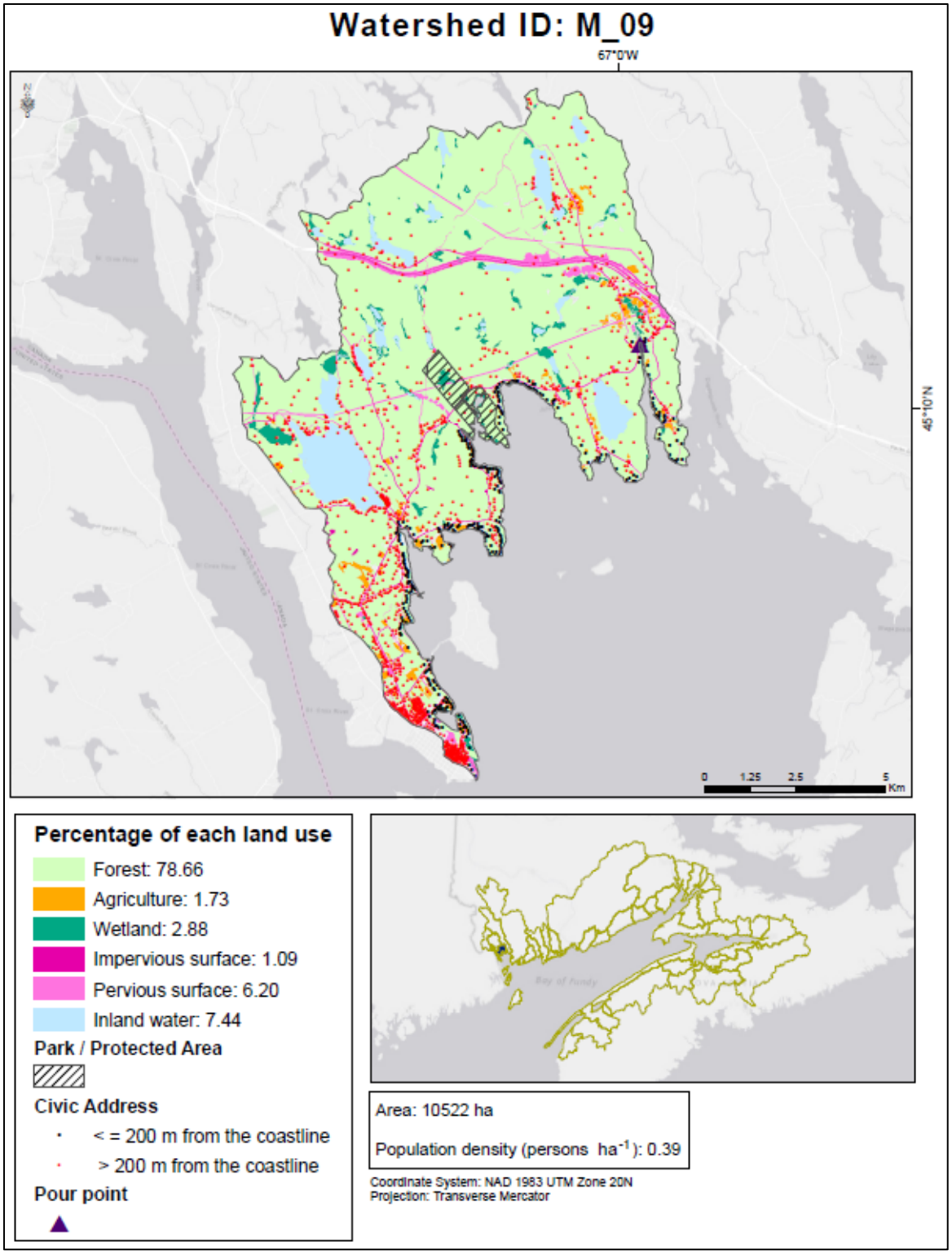


Figure 25. Land-use map for Magaguadavic watershed M_09. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

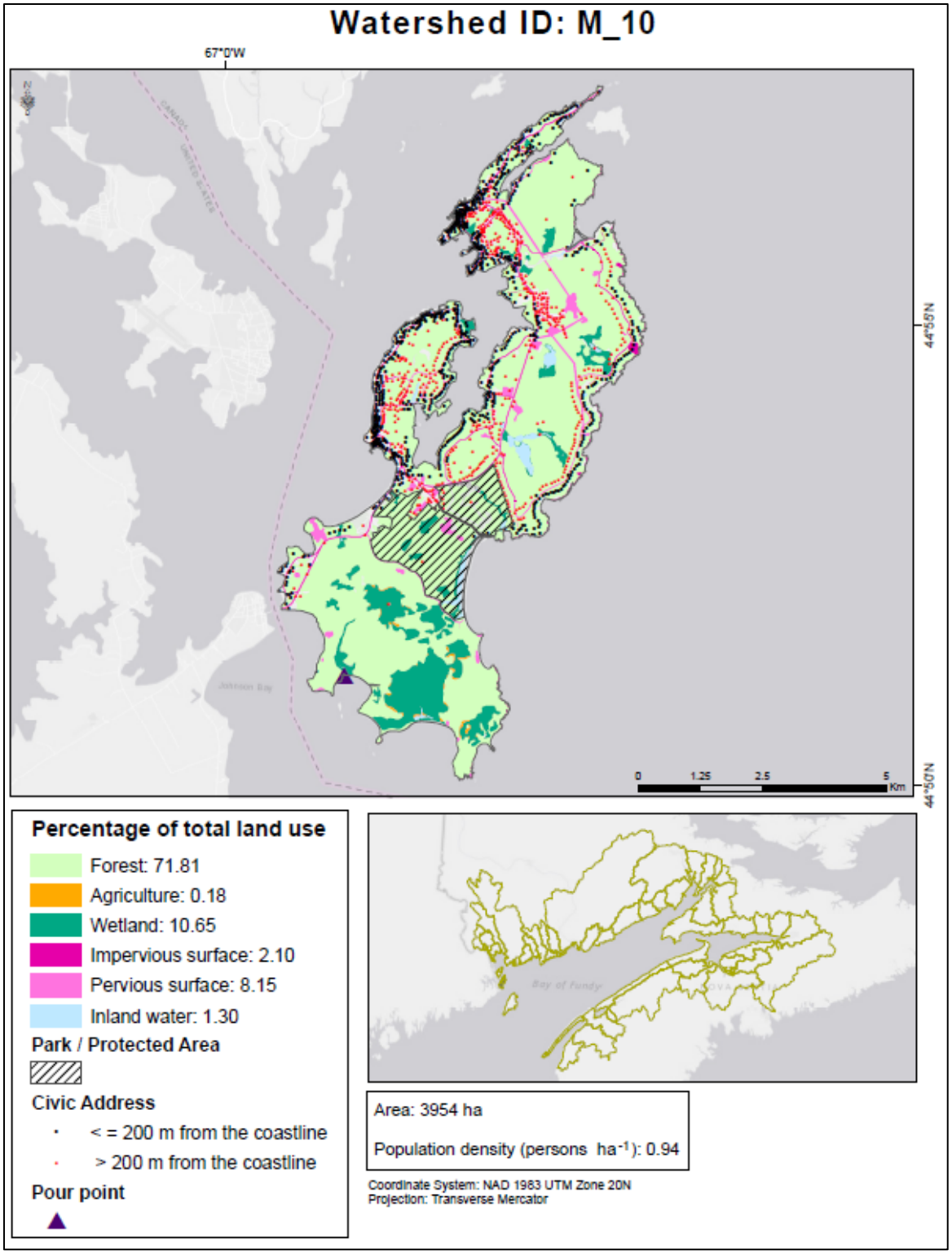


Figure 26. Land-use map for Magaguadavic watershed M_10. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

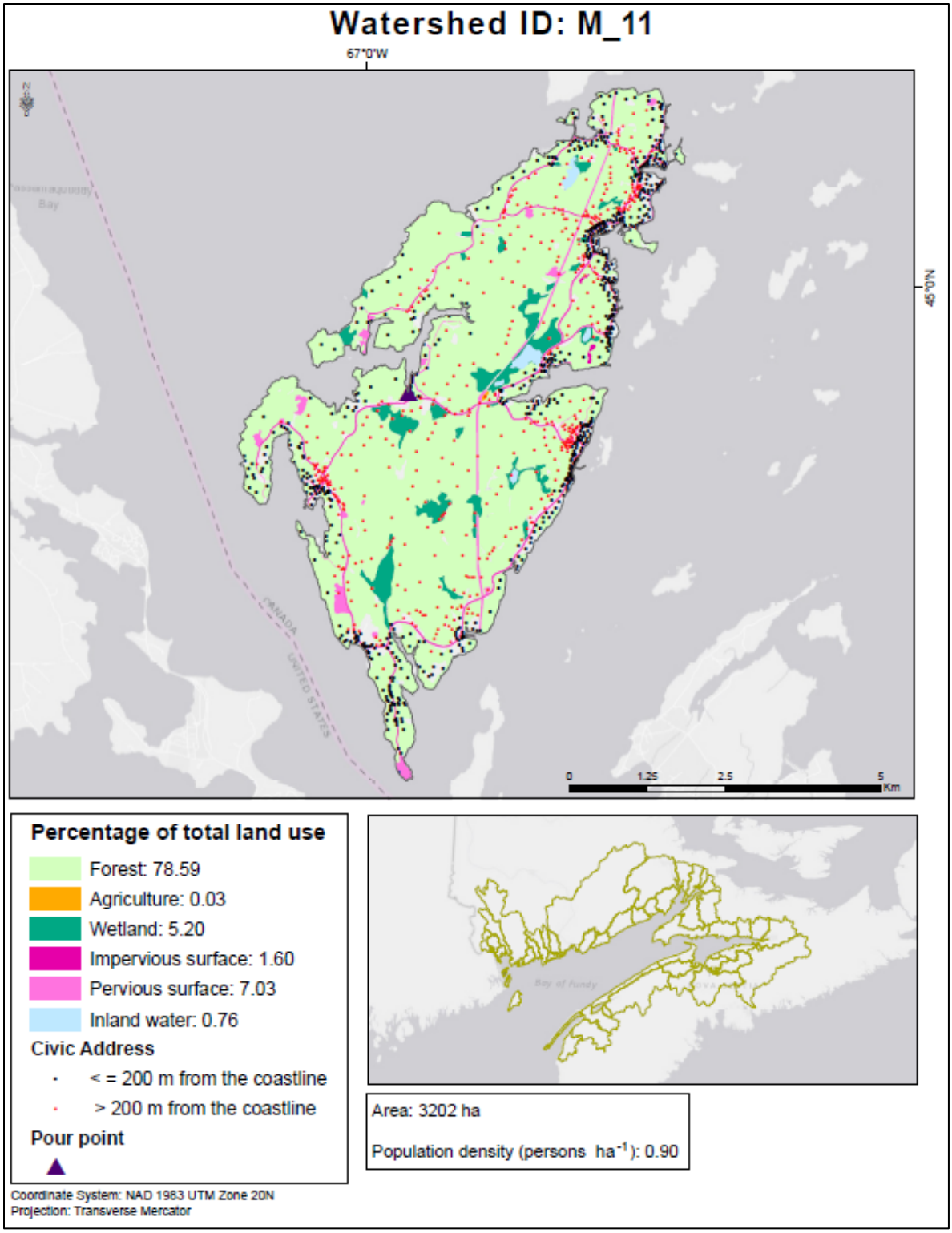


Figure 27. Land-use map for Magaguadavic watershed M_11. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

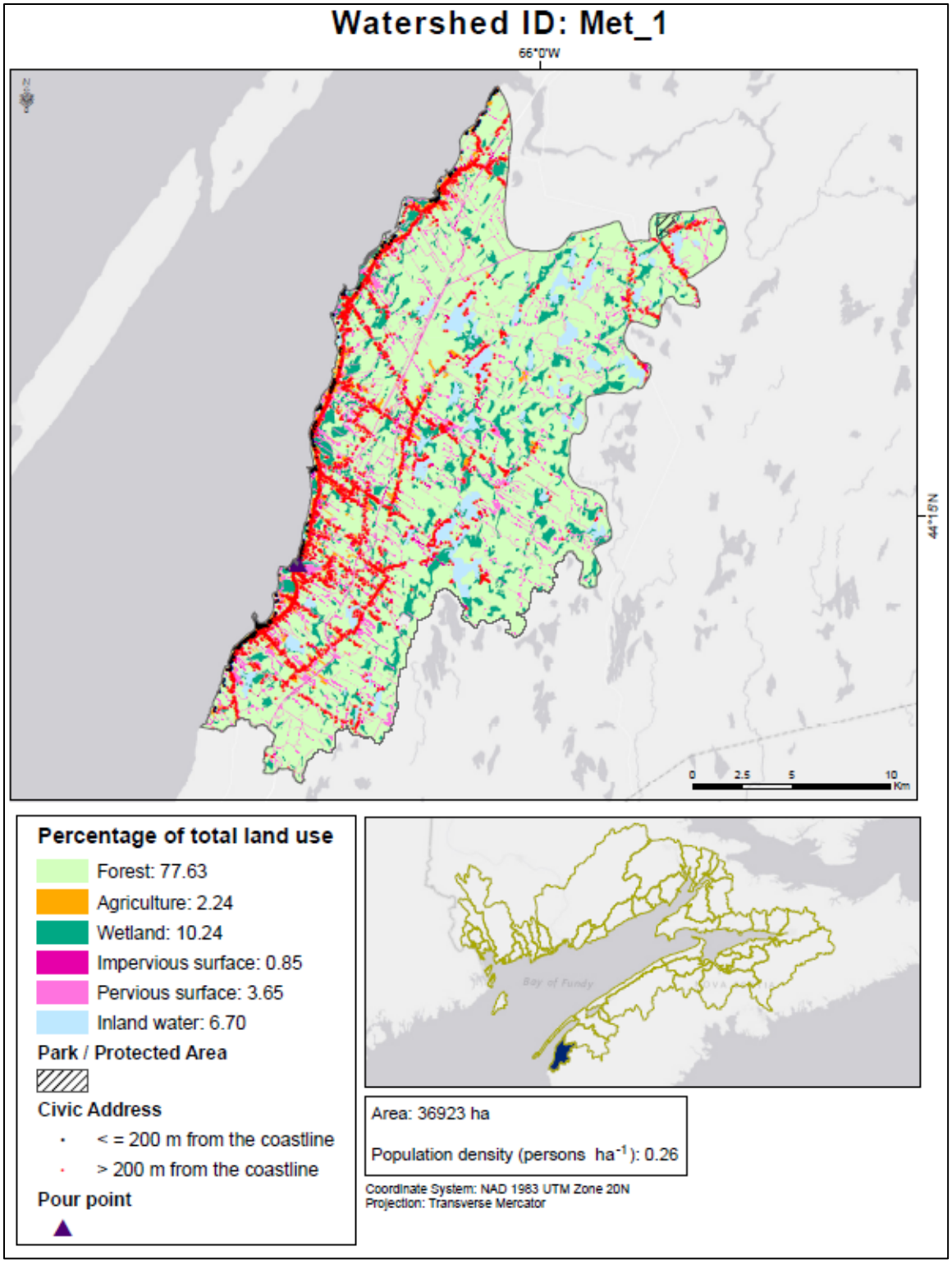


Figure 28. Land-use map for Meteghan watershed Met_1. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

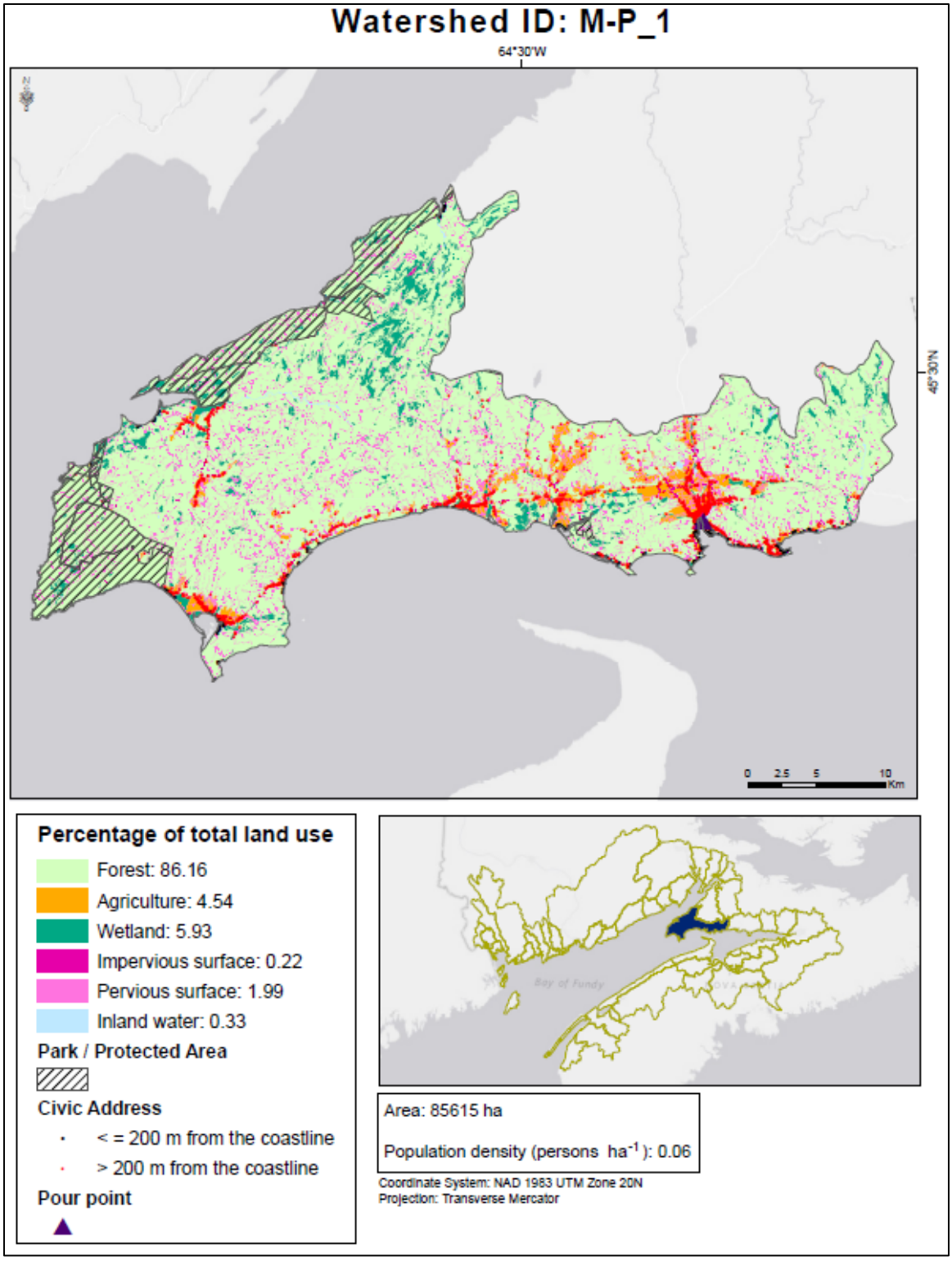


Figure 29. Land-use map for Minas Channel - Parrsboro watershed M-P_1. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

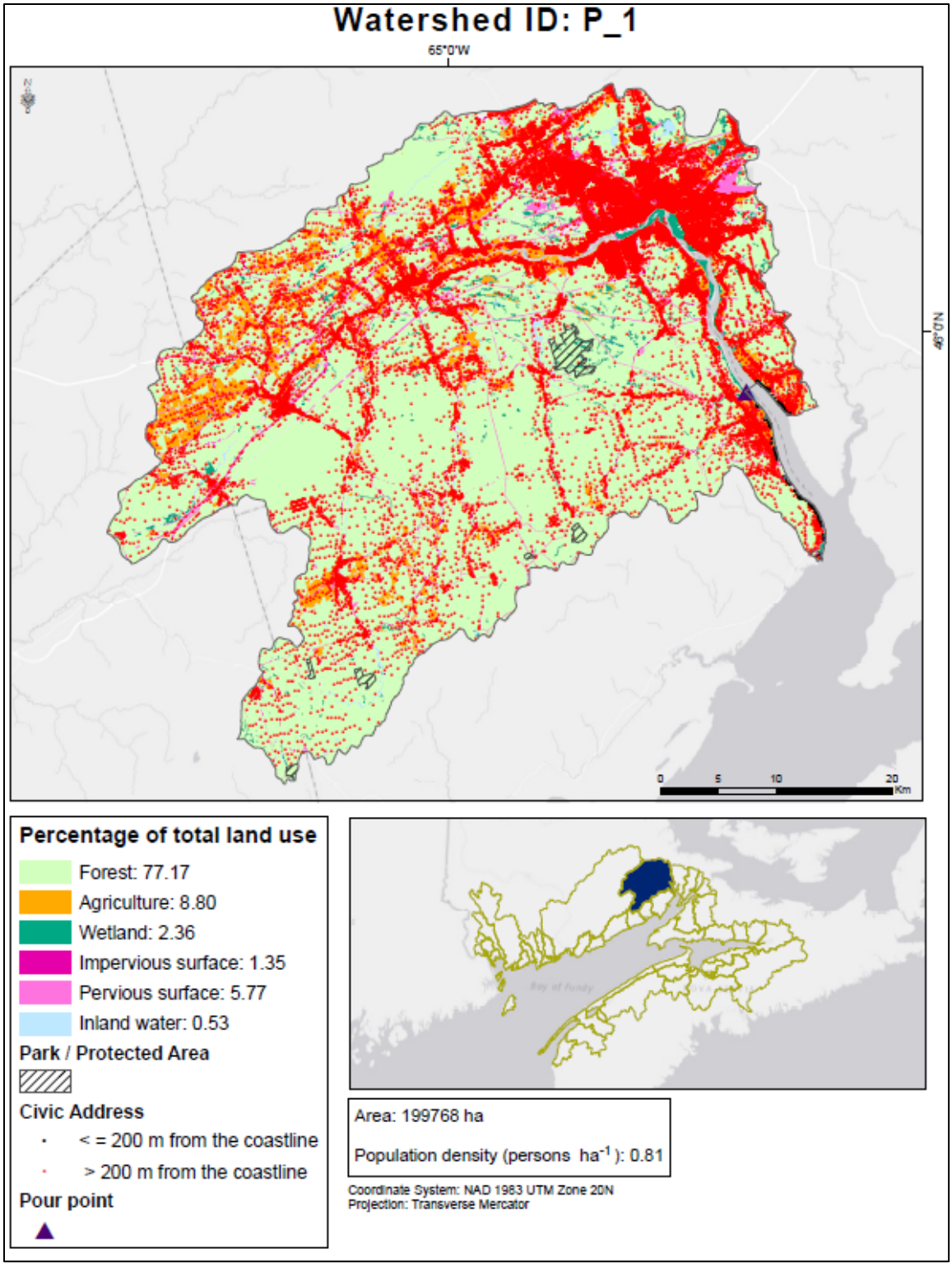


Figure 30. Land-use map for Petitcodiac watershed P_1. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

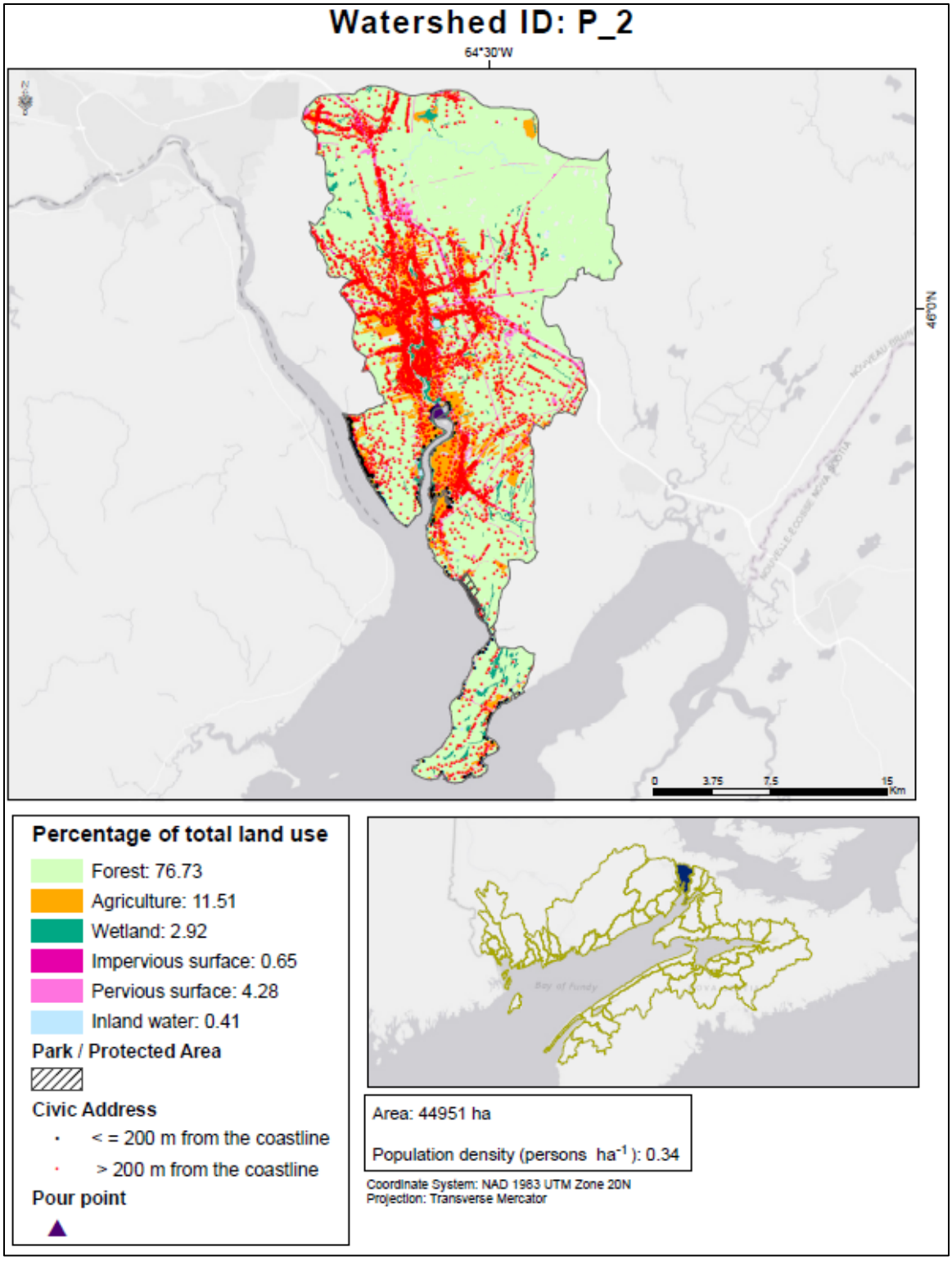


Figure 31. Land-use map for Petitcodiac watershed P_2. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

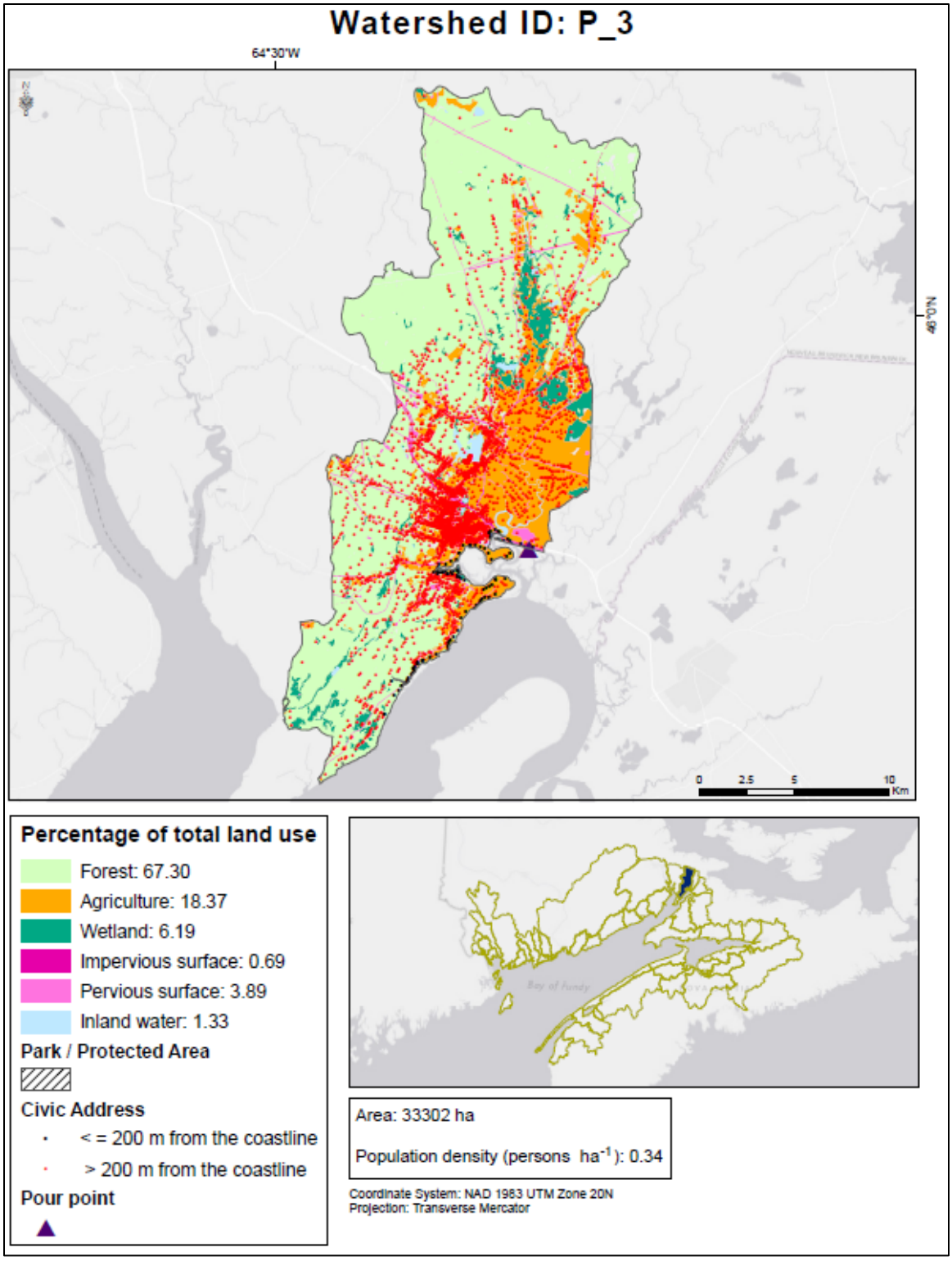


Figure 32. Land-use map for Petitcodiac watershed P_3. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

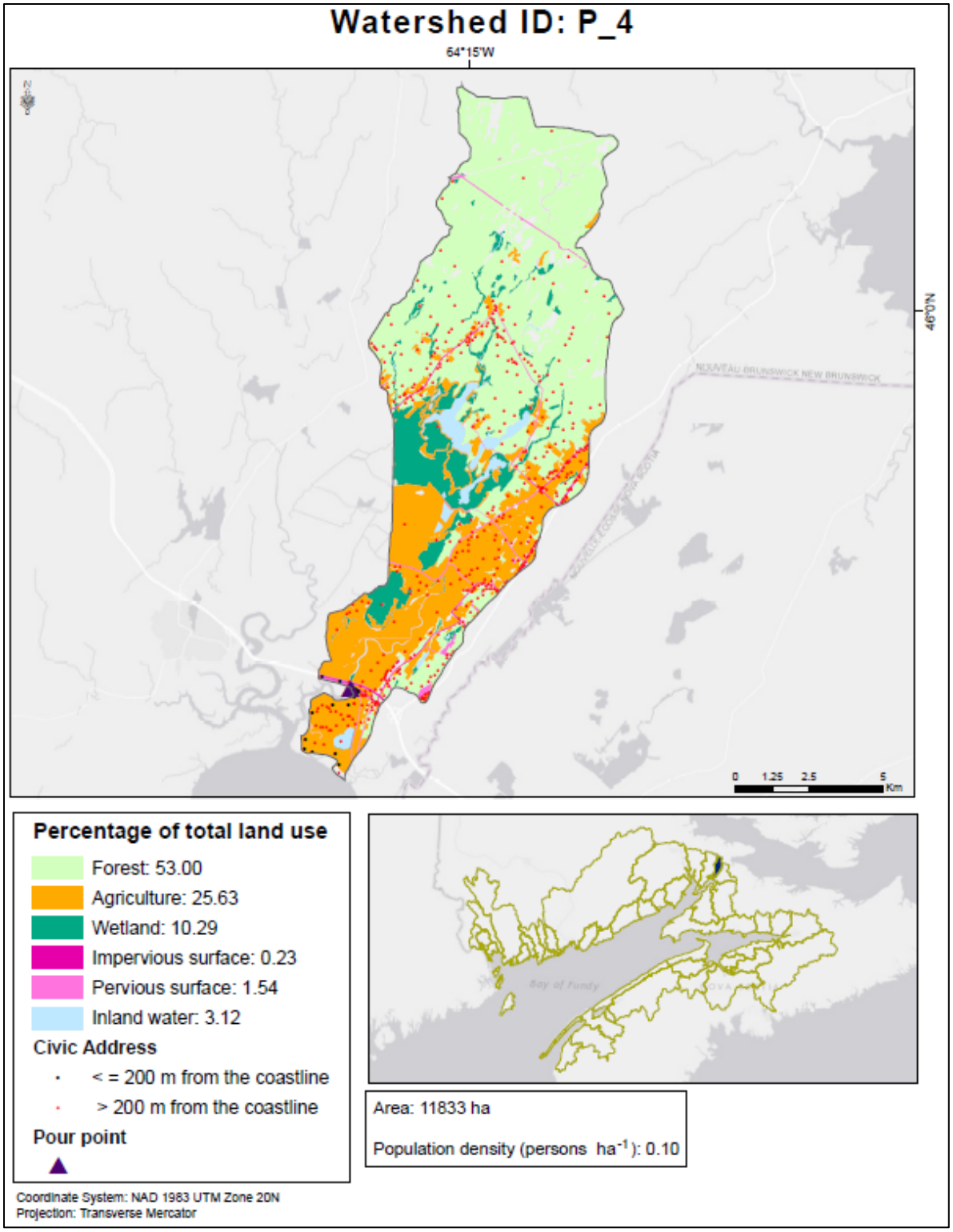


Figure 33. Land-use map for Petitcodiac watershed P_4. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

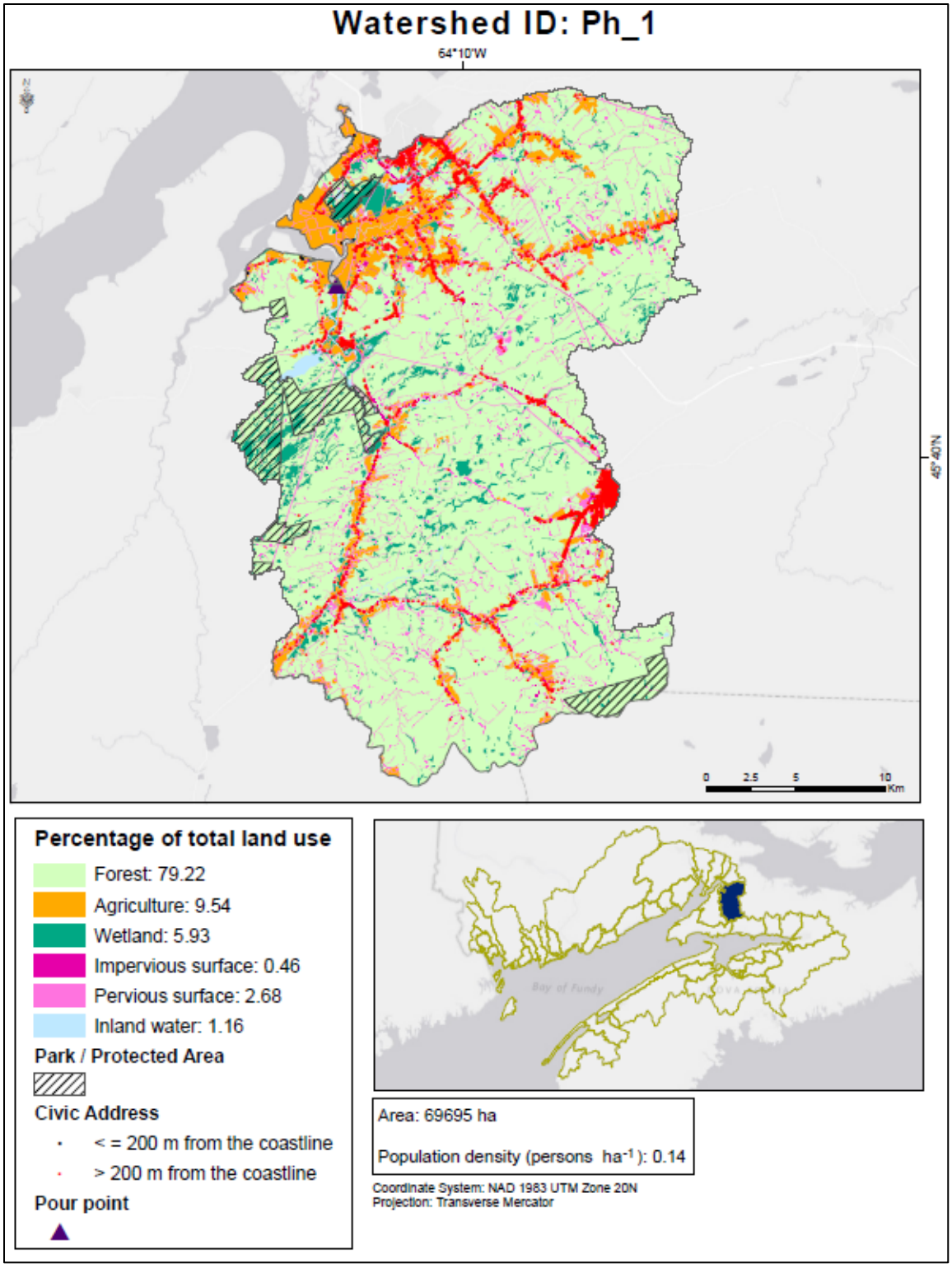


Figure 34. Land-use map for Philip watershed Ph_1. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

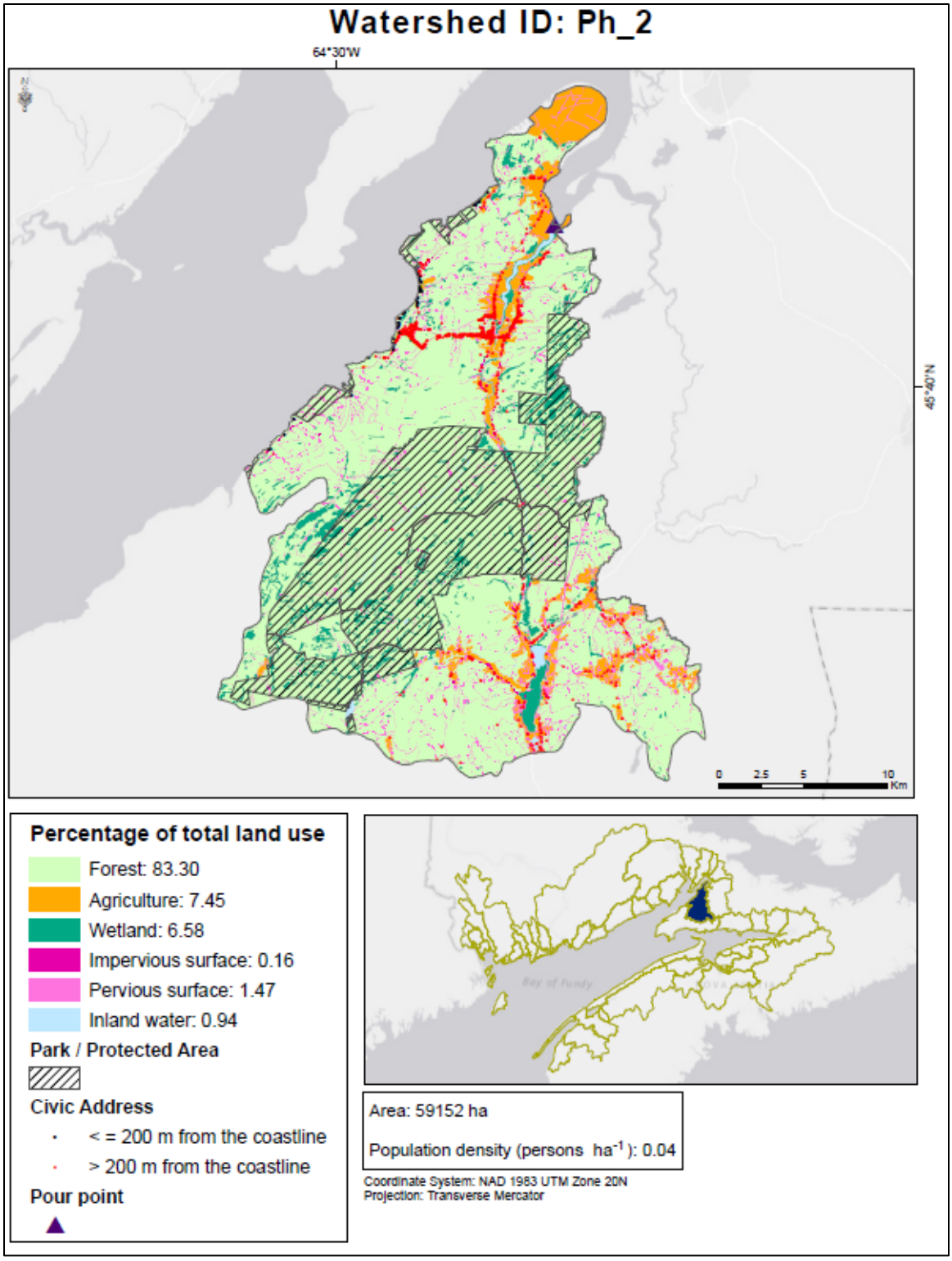


Figure 35. Land-use map for Philip watershed Ph_2. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

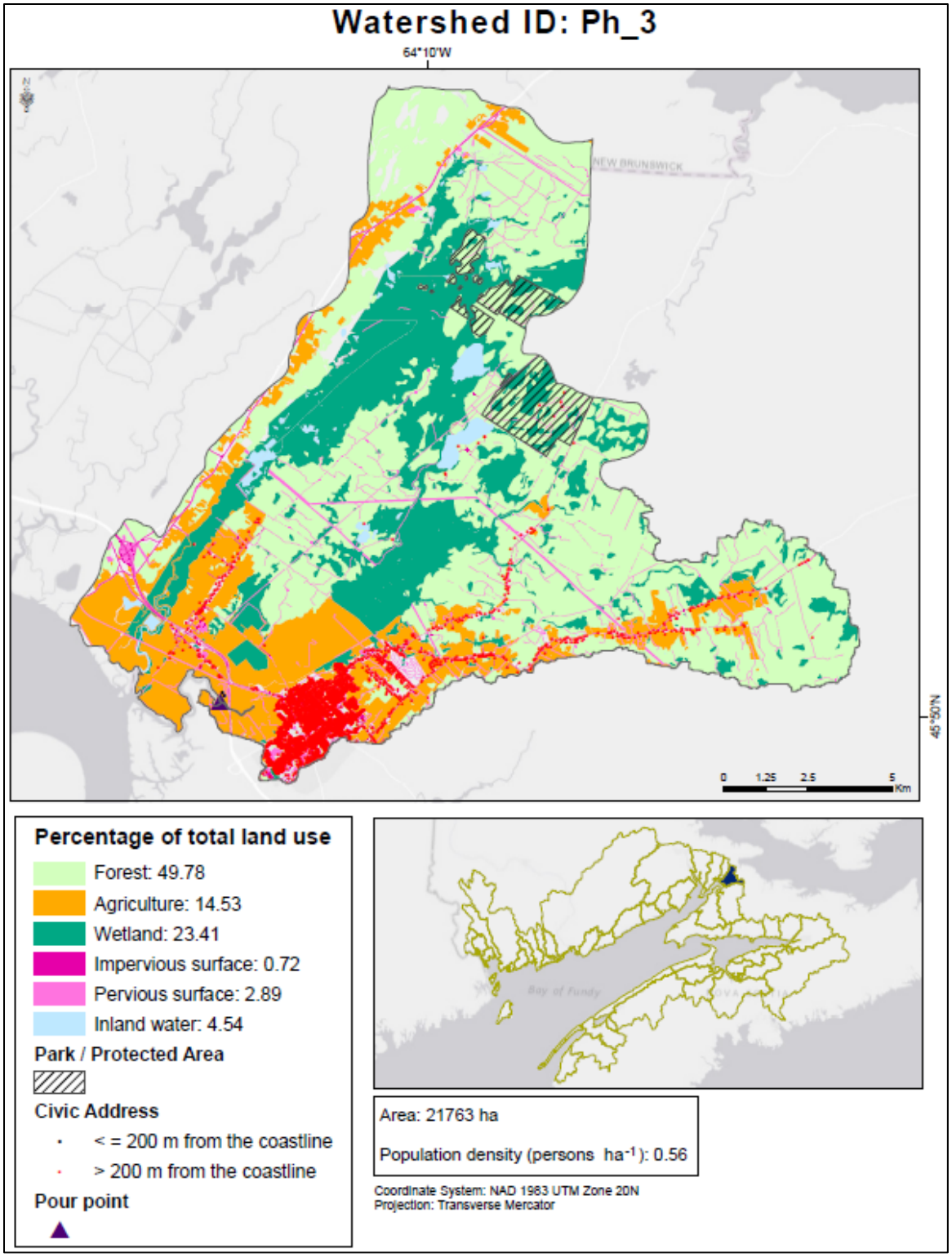


Figure 36. Land-use map for Philip watershed Ph_3. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

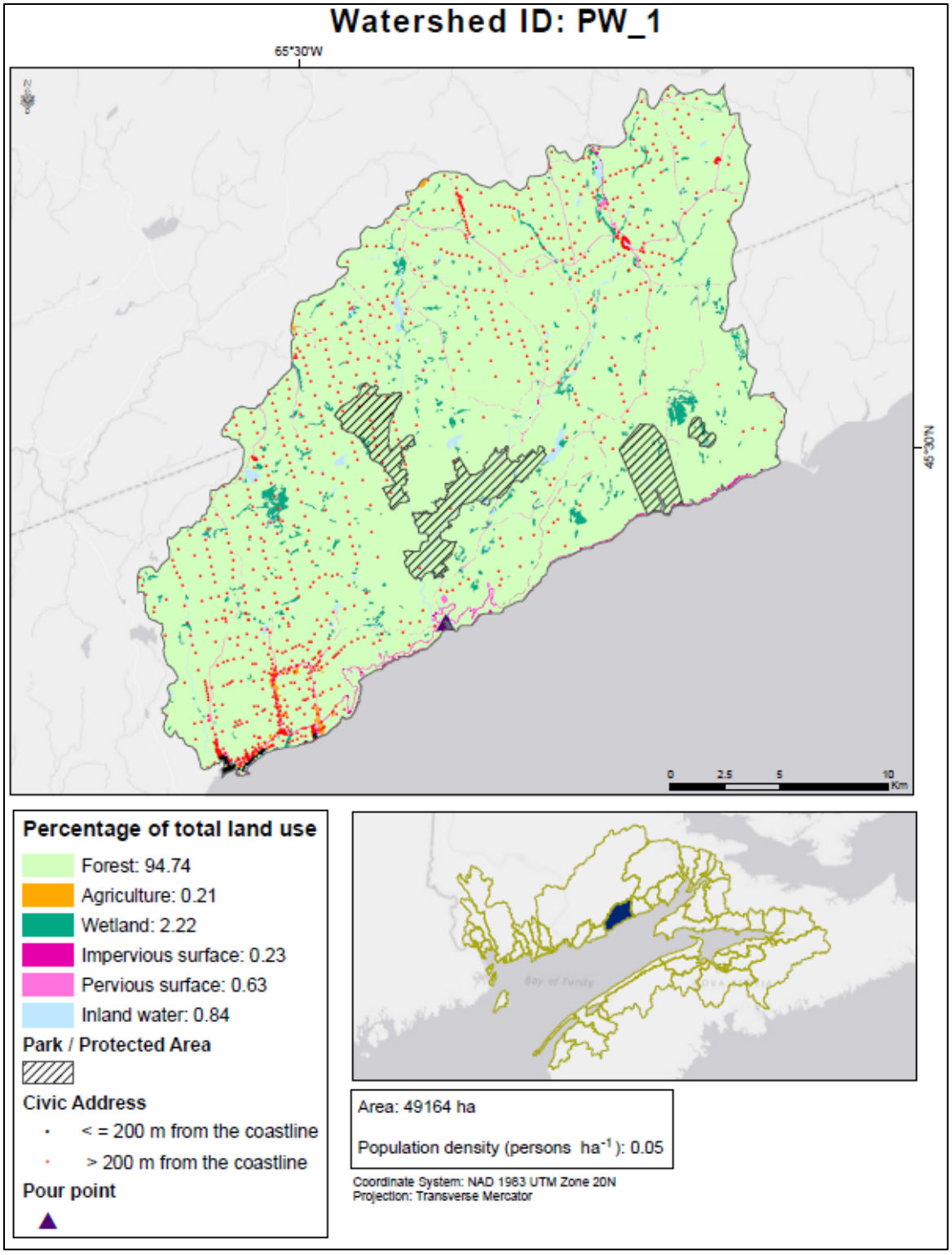


Figure 37. Land-use map for Point Wolfe watershed PW_1. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

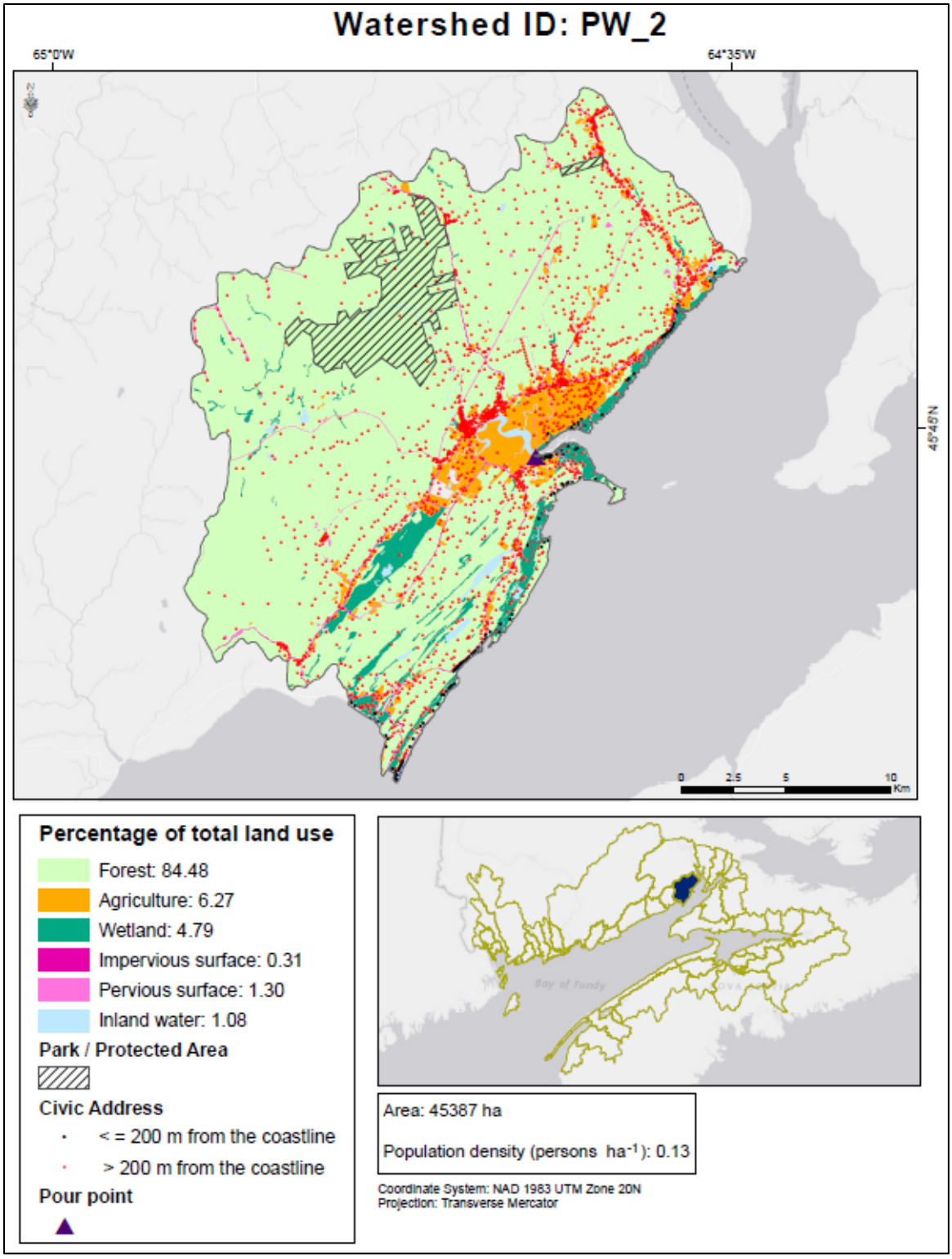


Figure 38. Land-use map for Point Wolfe watershed PW_2. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

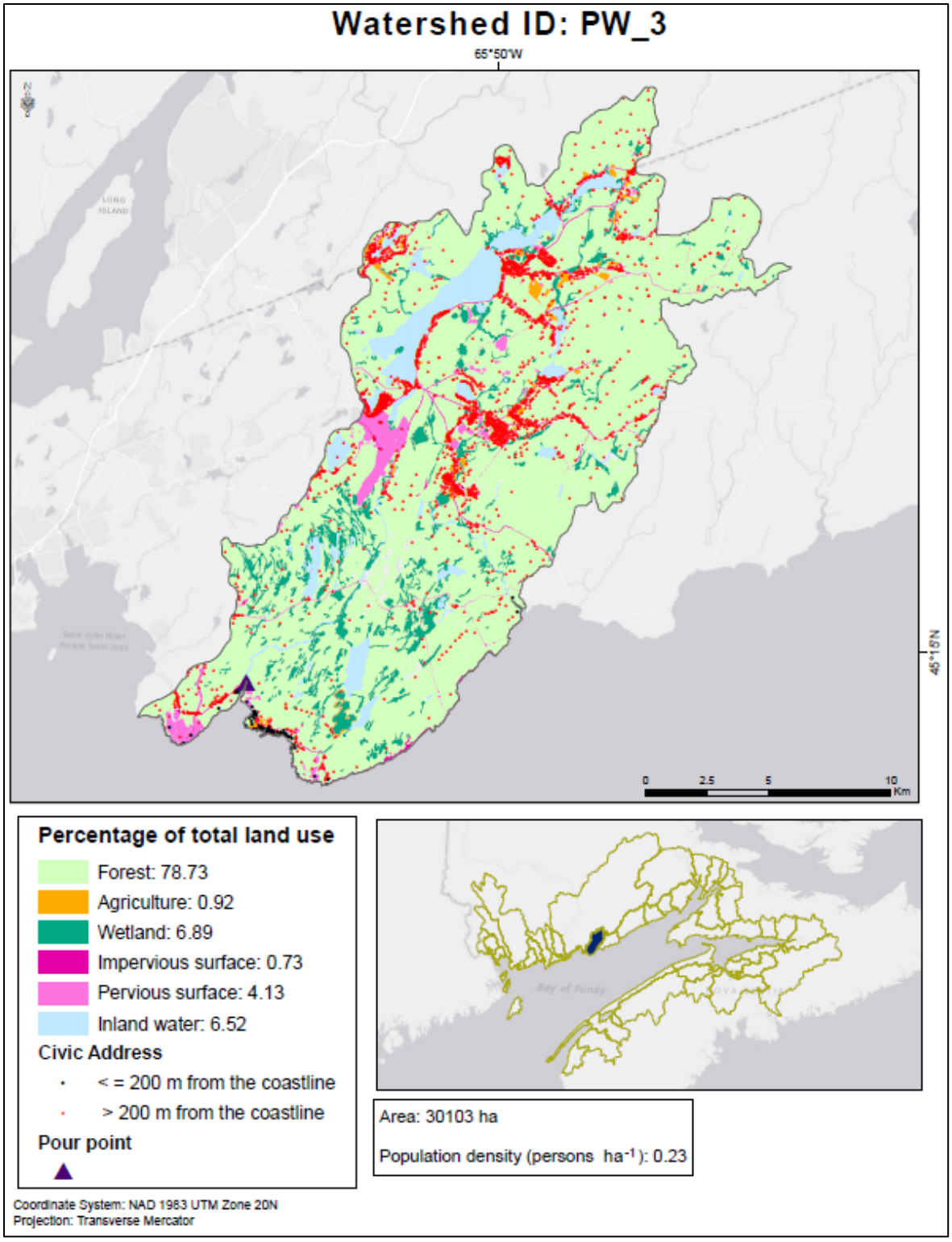


Figure 39. Land-use map for Point Wolfe watershed PW_3. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

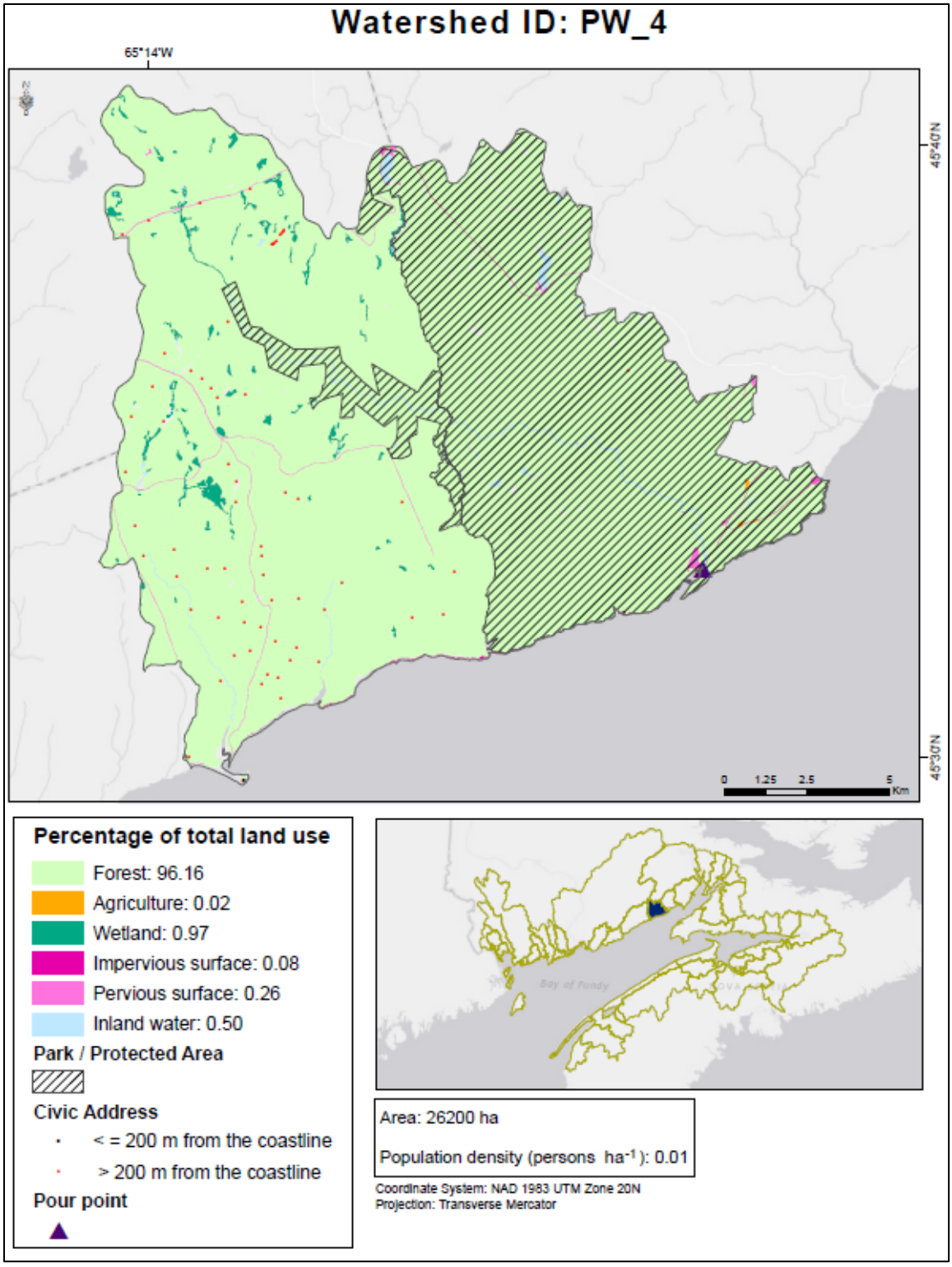


Figure 40. Land-use map for Point Wolfe watershed PW_4. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

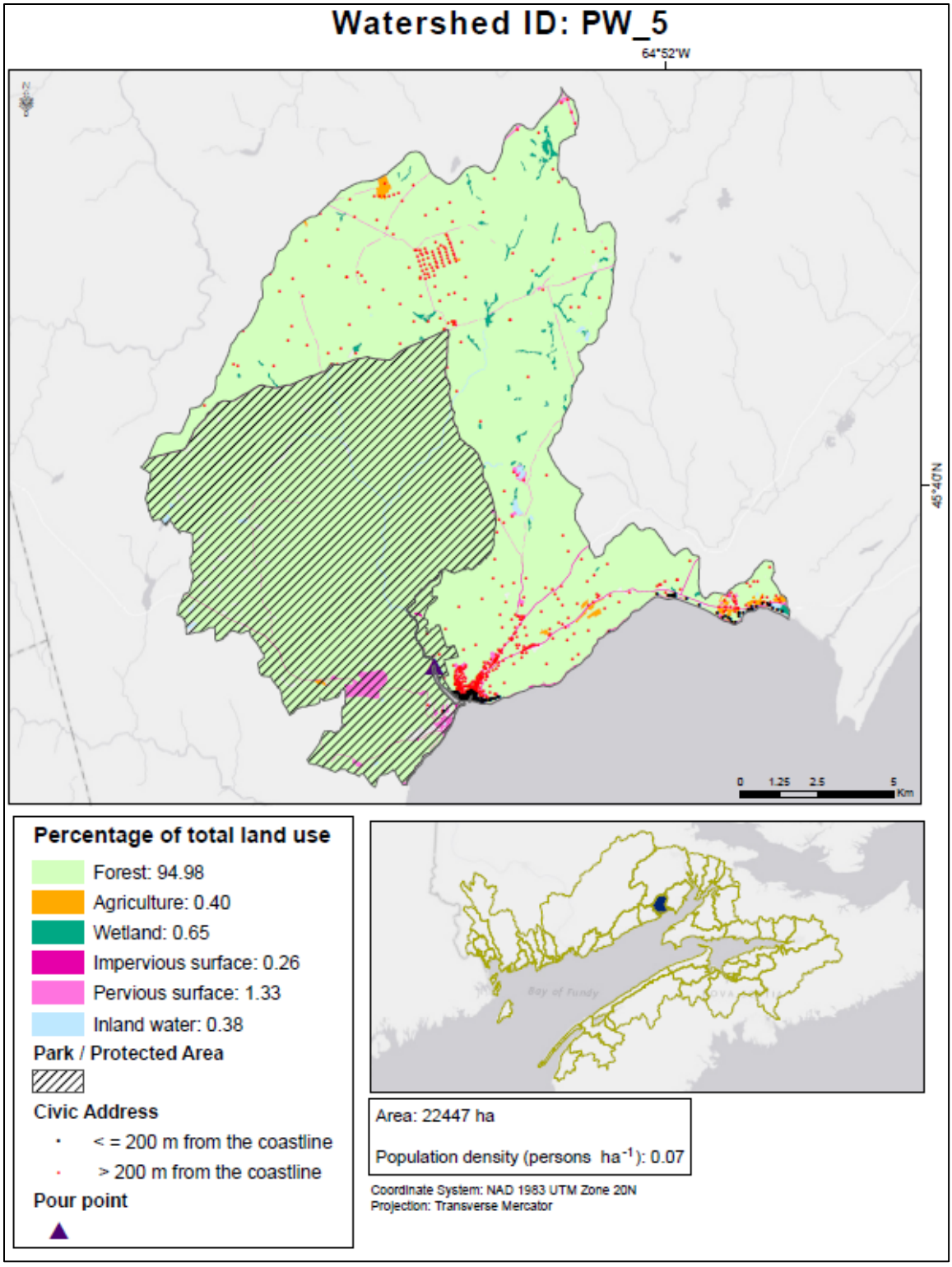


Figure 41. Land-use map for Point Wolfe watershed PW_5. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

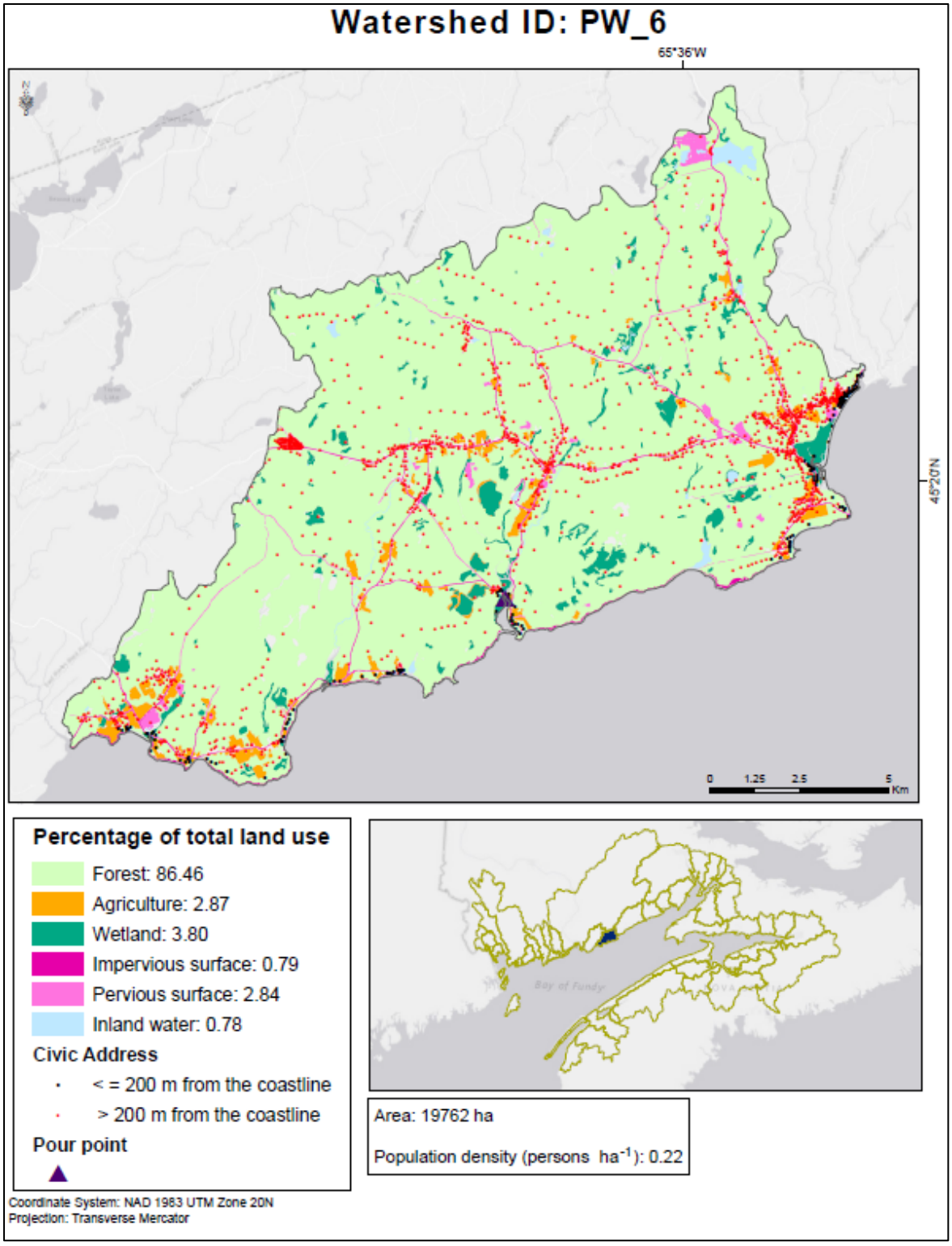


Figure 42. Land-use map for Point Wolfe watershed PW_6. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

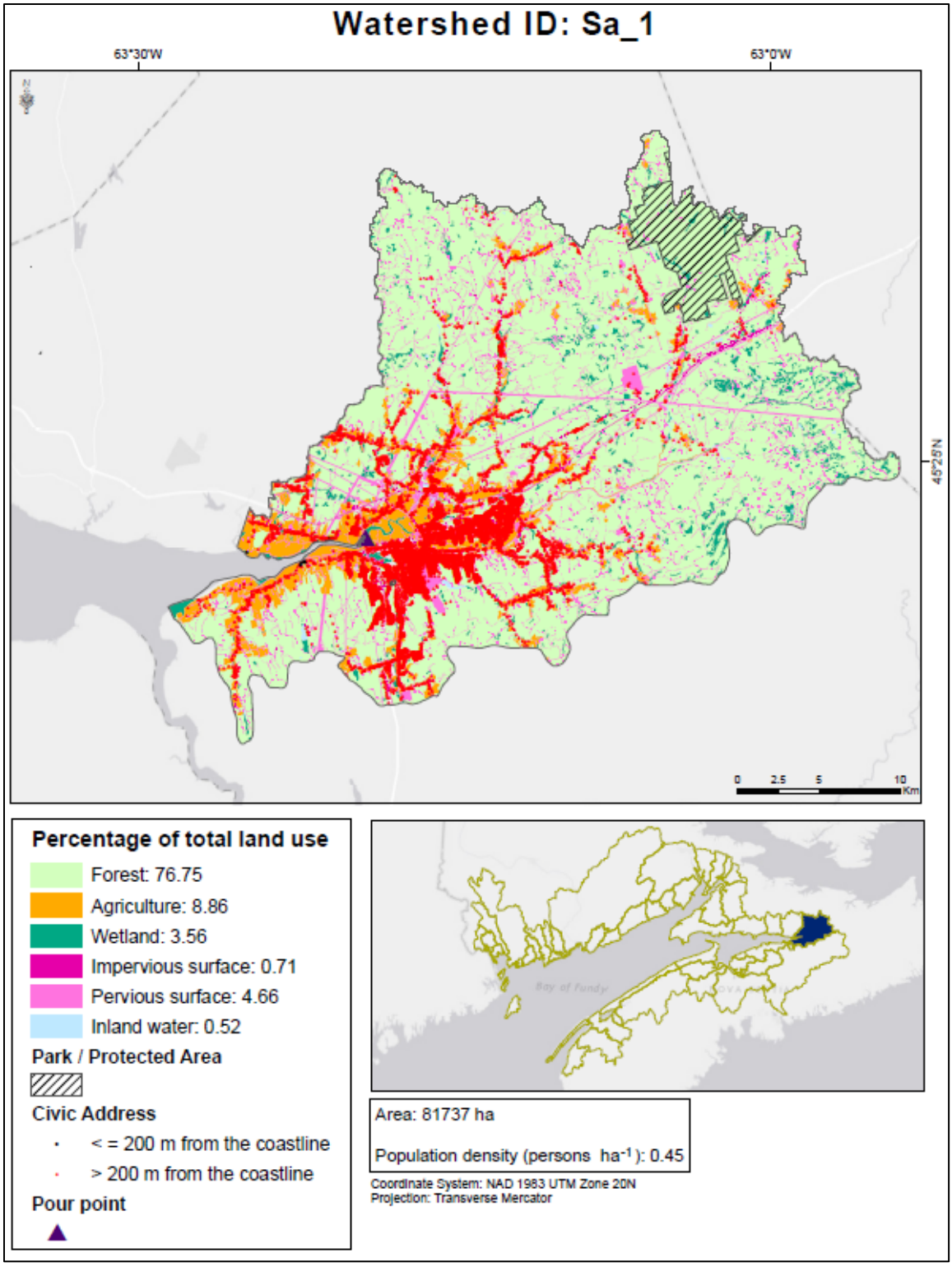


Figure 43. Land-use map for Salmon watershed Sa_1. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

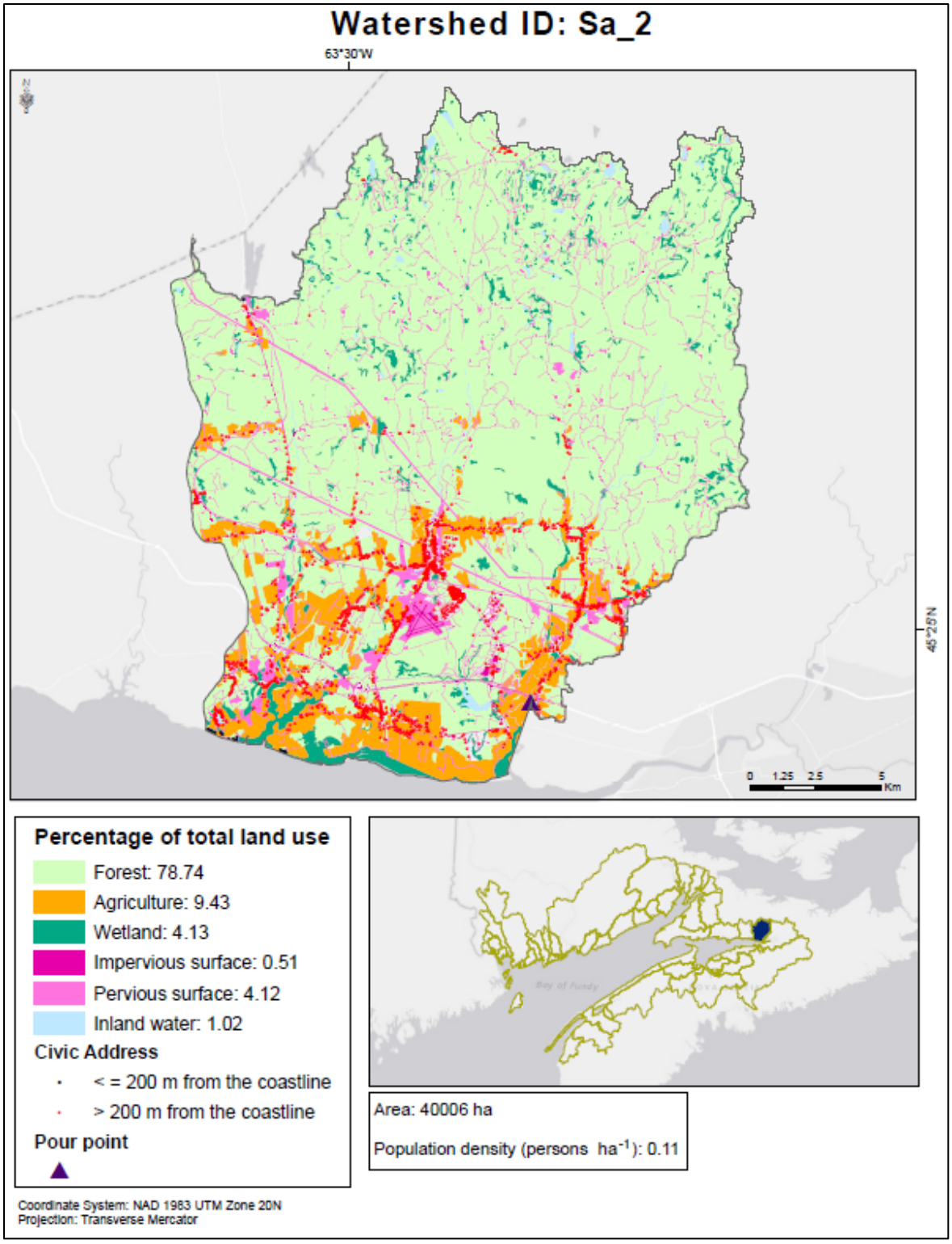


Figure 44. Land-use map for Salmon watershed Sa_2. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

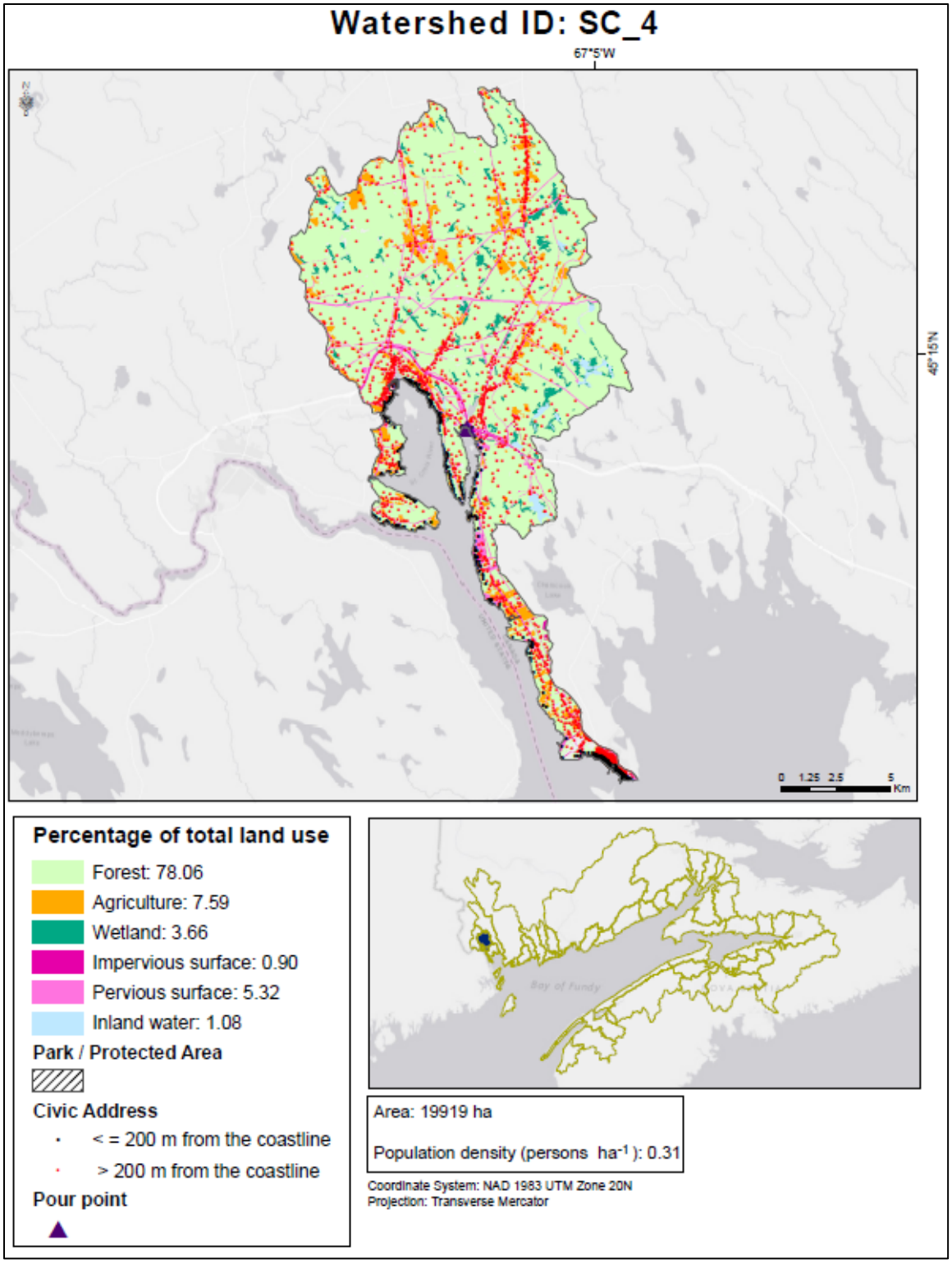


Figure 45. Land-use map for St. Croix watershed SC_4. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

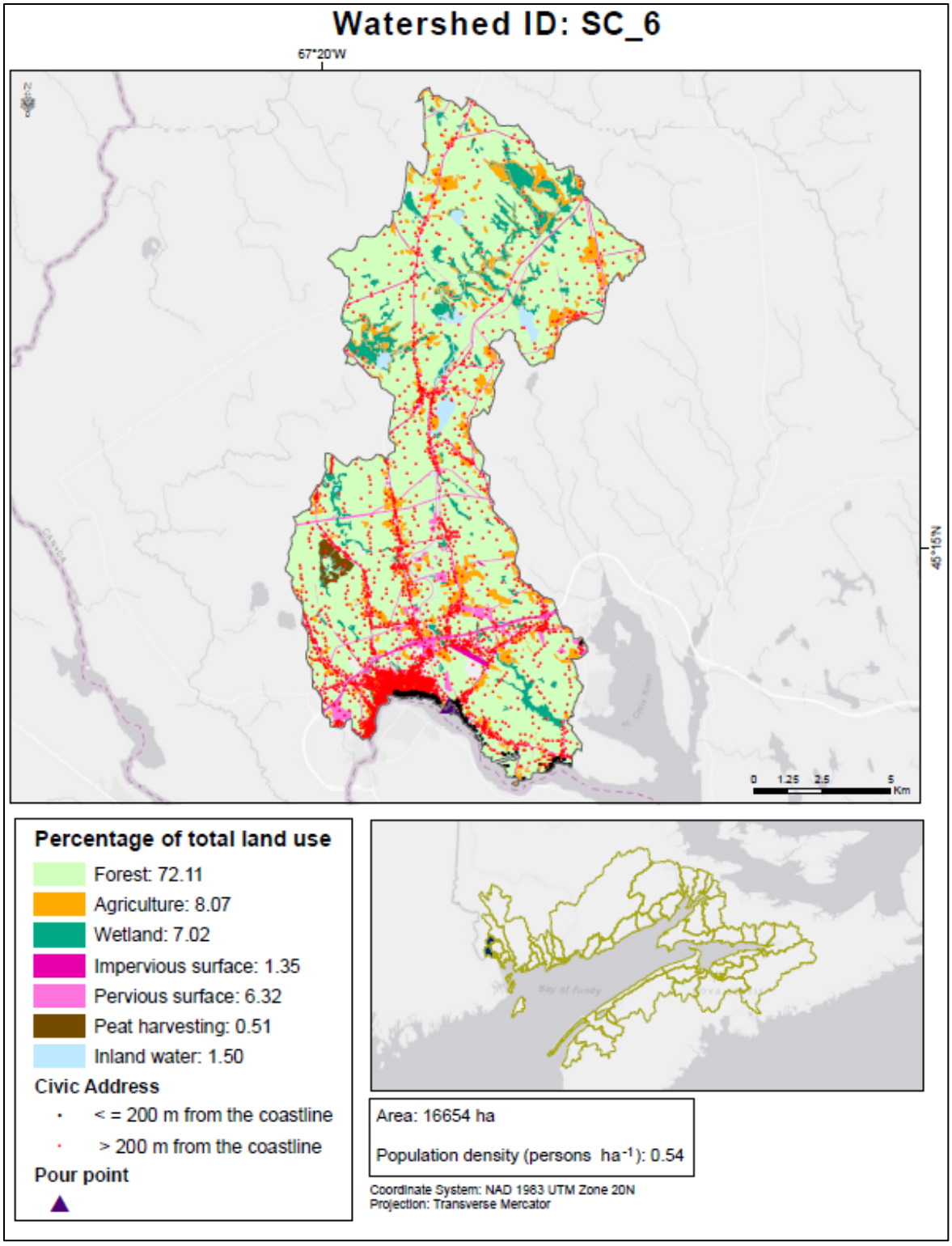


Figure 46. Land-use map for St. Croix watershed SC_6. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

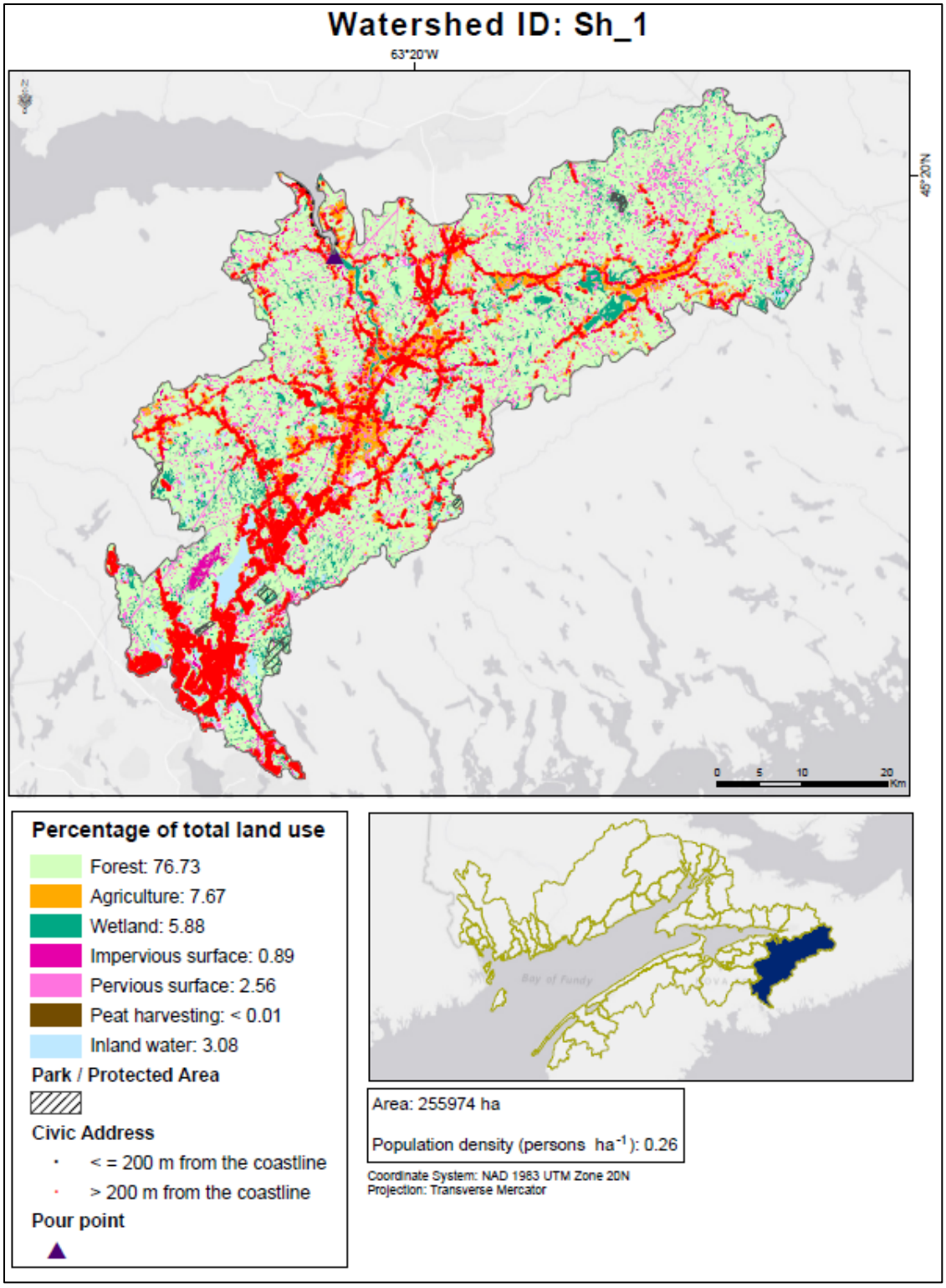


Figure 47. Land-use map for Shubenacadie watershed Sh_1. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

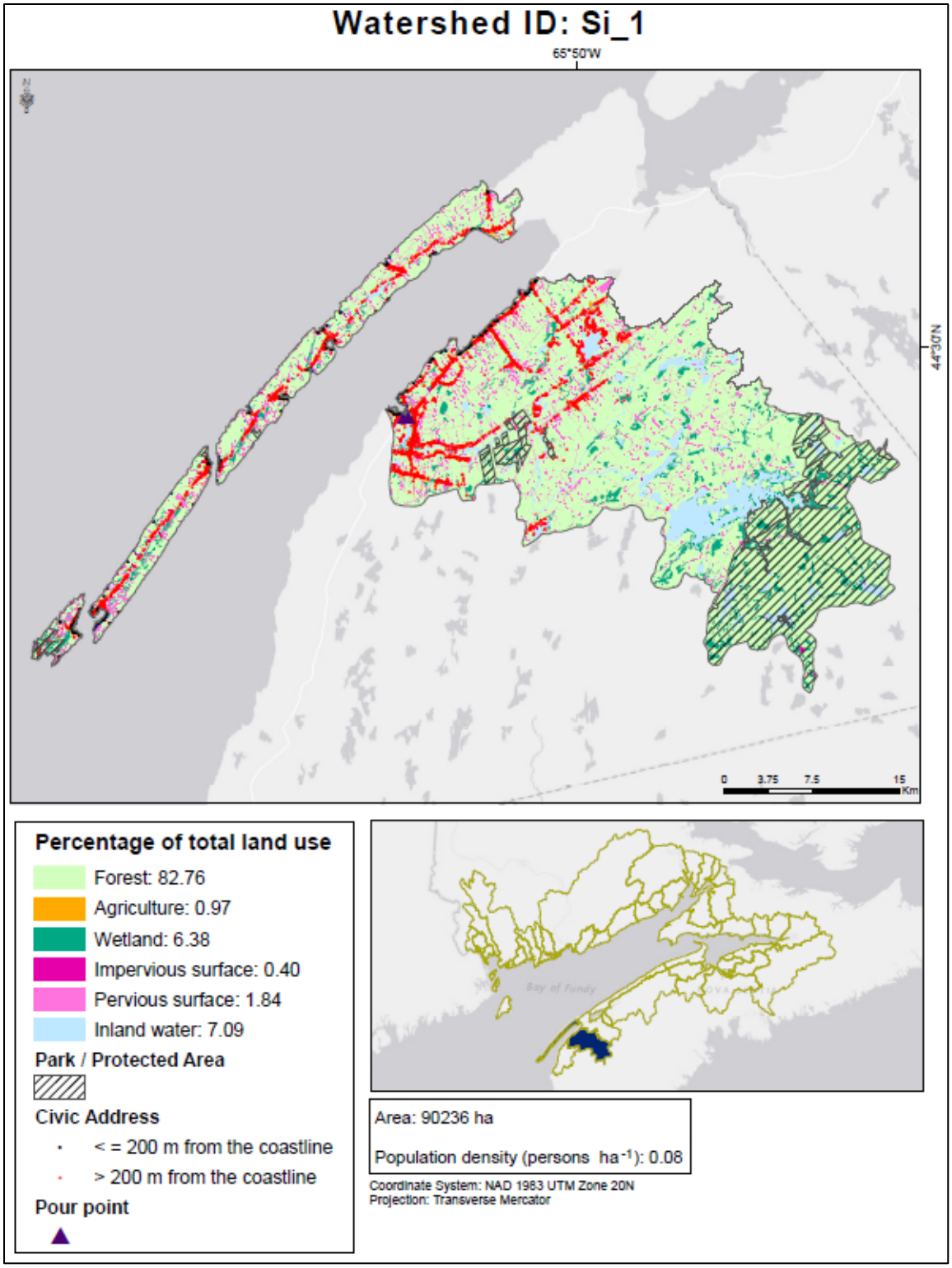


Figure 48. Land-use map for Sissiboo watershed Si_1. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

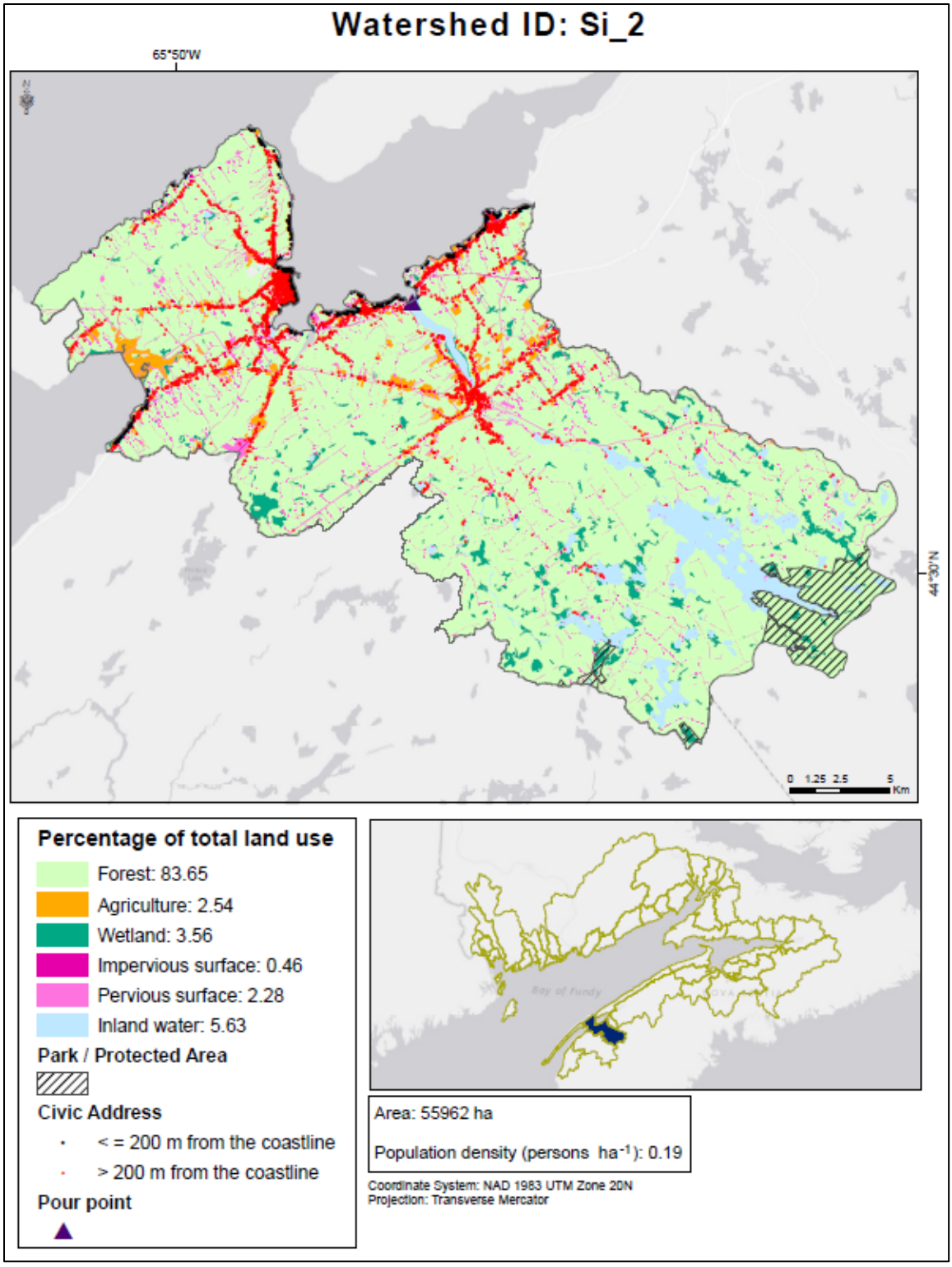


Figure 49. Land-use map for Sissiboo watershed Si_2. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

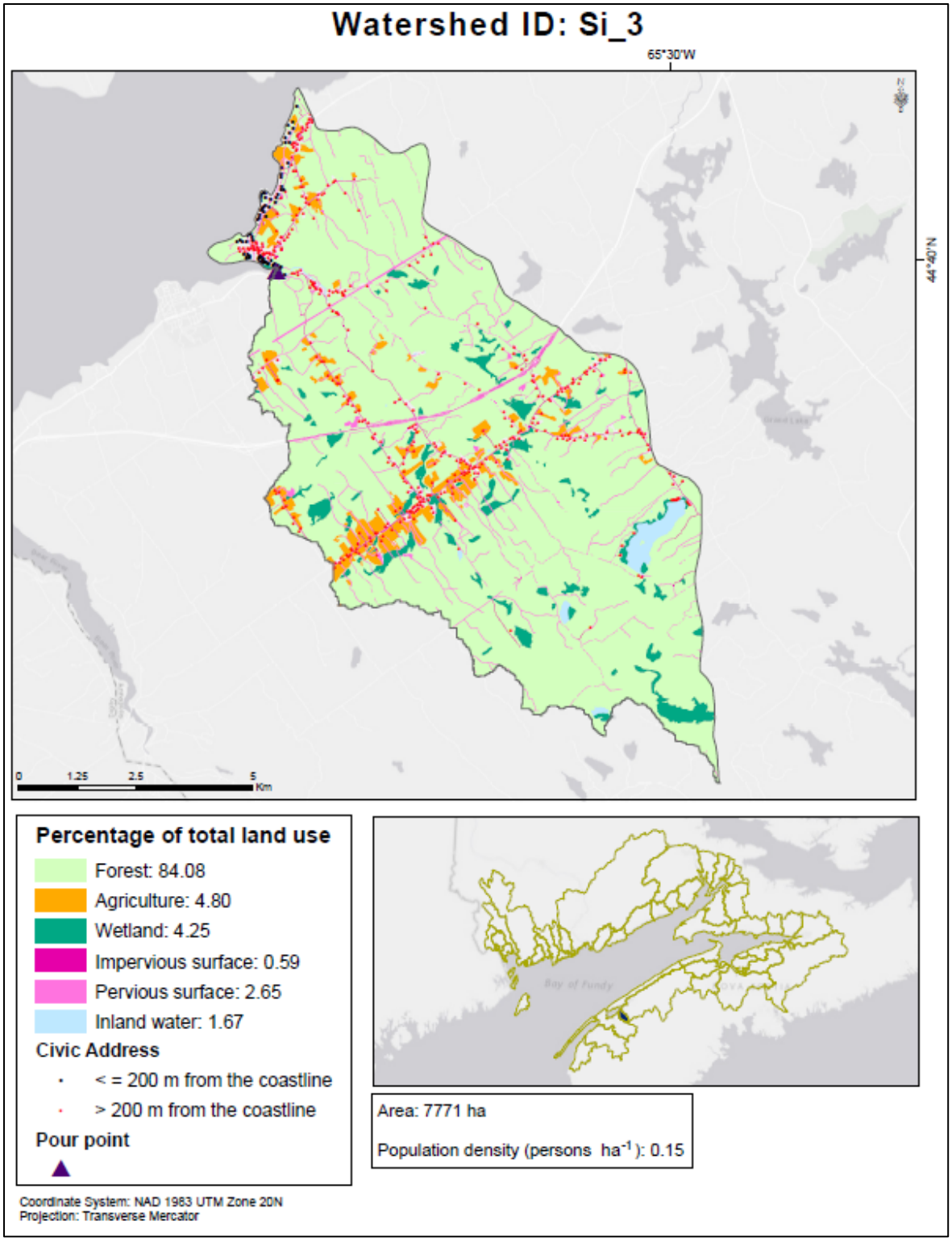


Figure 50. Land-use map for Sissiboo watershed Si_3. Insets: Watershed area and population density (lower right); location of watershed in relation to the Bay of Fundy sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

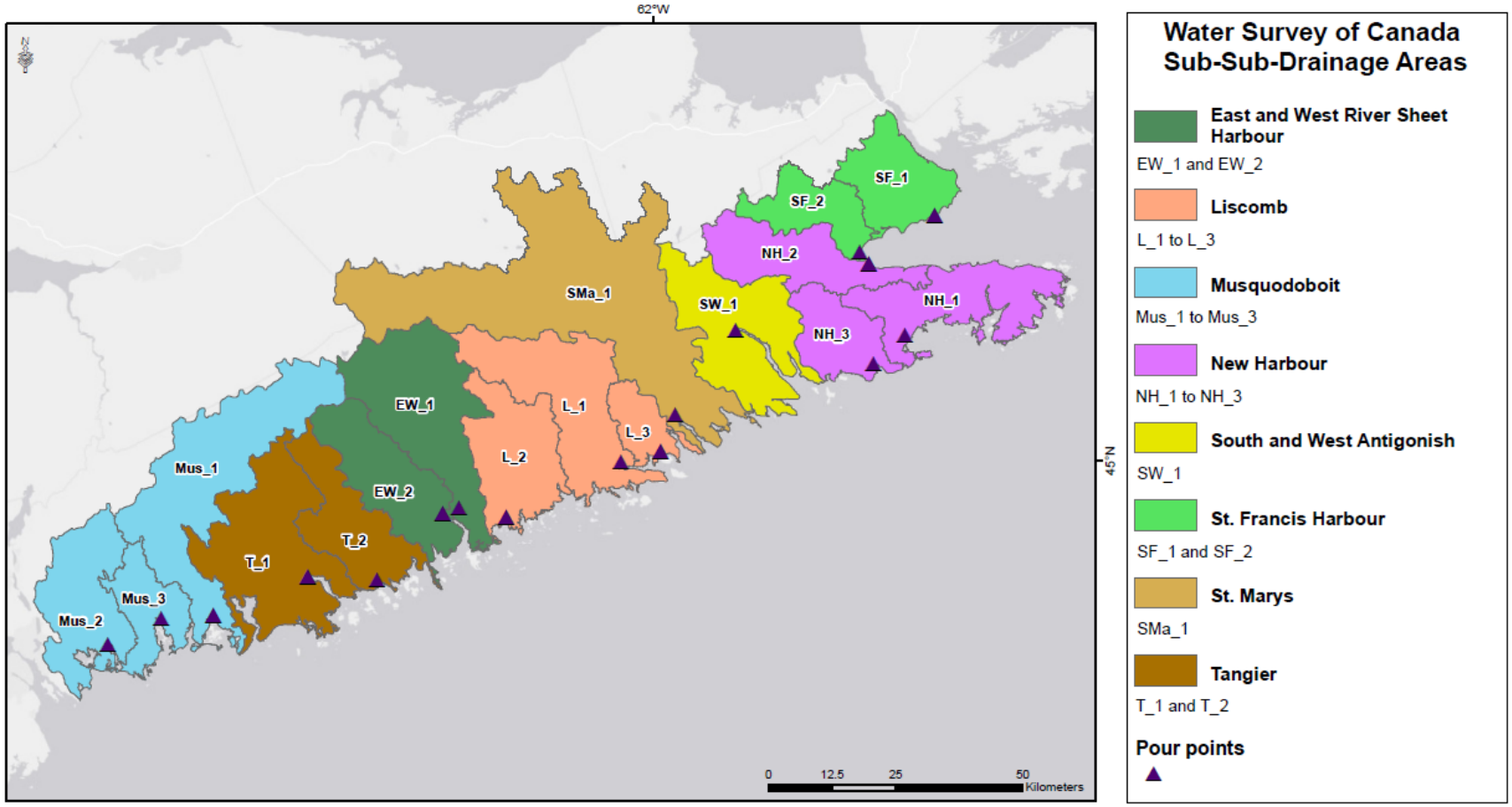


Figure 51. Eastern sub-region, displaying eight Water Survey of Canada sub-sub-drainage areas (denoted by differing colours) and their associated watersheds. Black triangles represent the major pour points (largest outlets into the coastal zone).

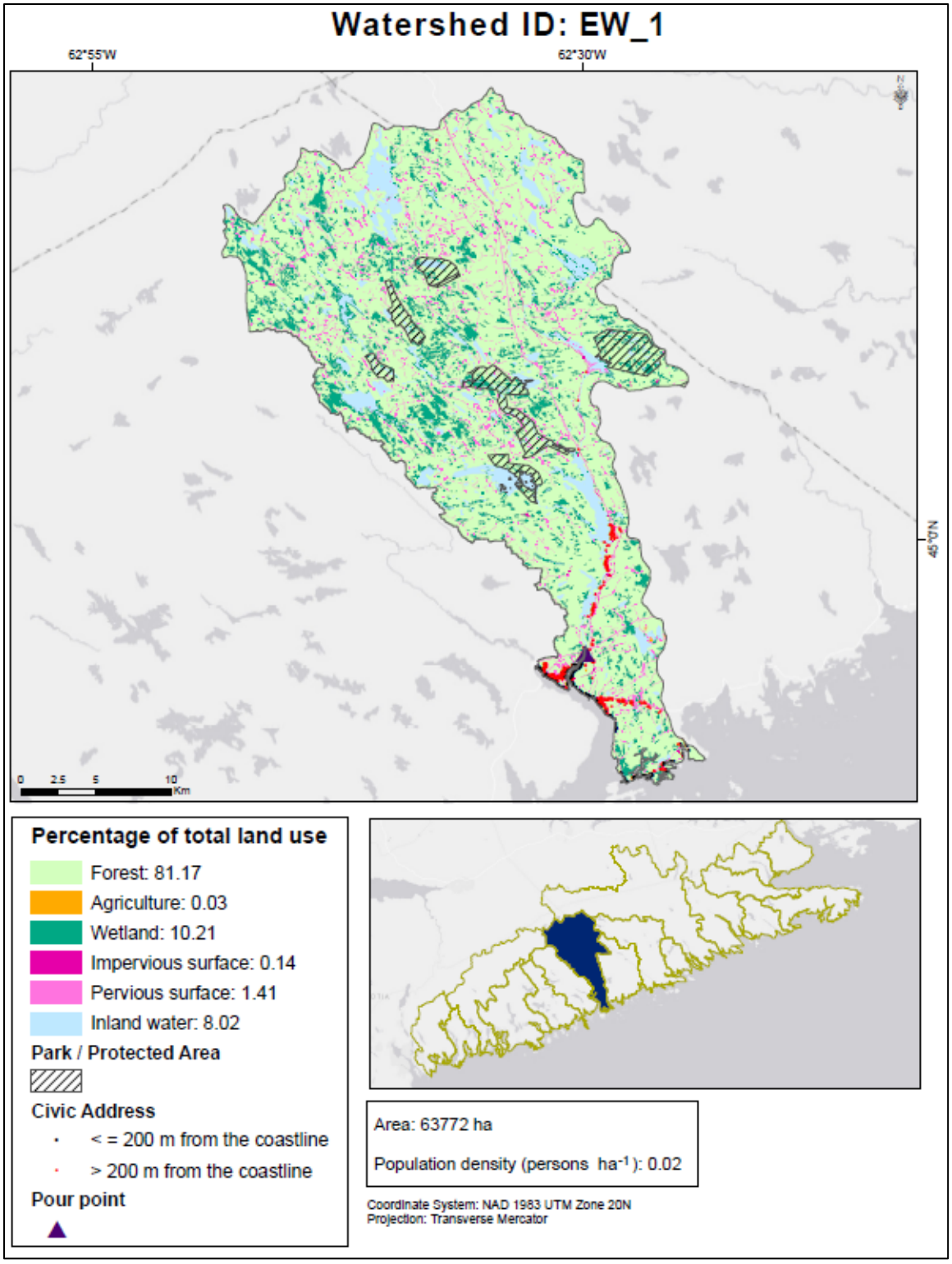


Figure 52. Land-use map for East and West River Sheet Harbour watershed EW_1. Insets: Watershed area and population density (lower right); location of watershed in relation to the Eastern sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

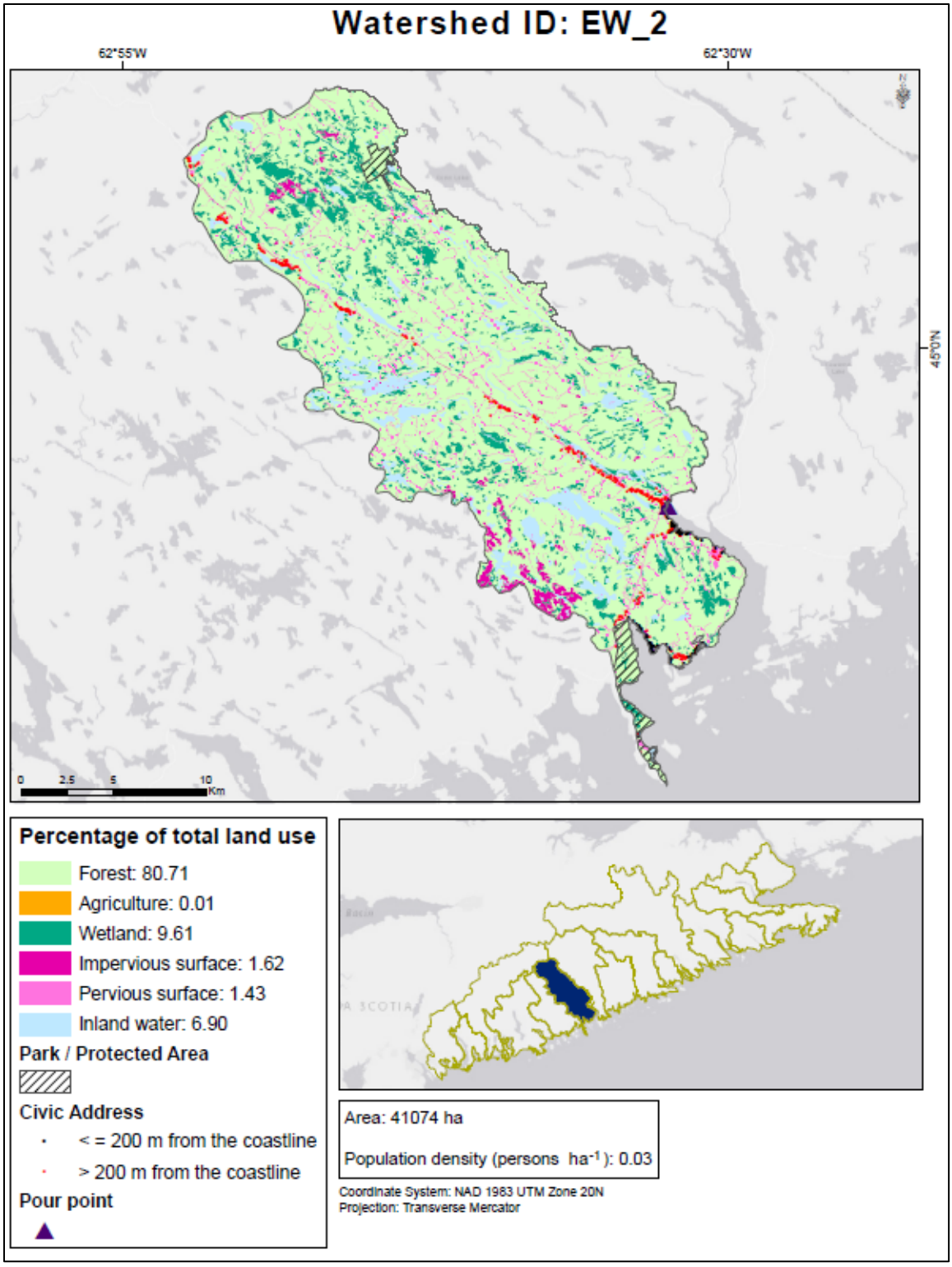


Figure 53. Land-use map for East and West River Sheet Harbour watershed EW_2. Insets: Watershed area and population density (lower right); location of watershed in relation to the Eastern sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

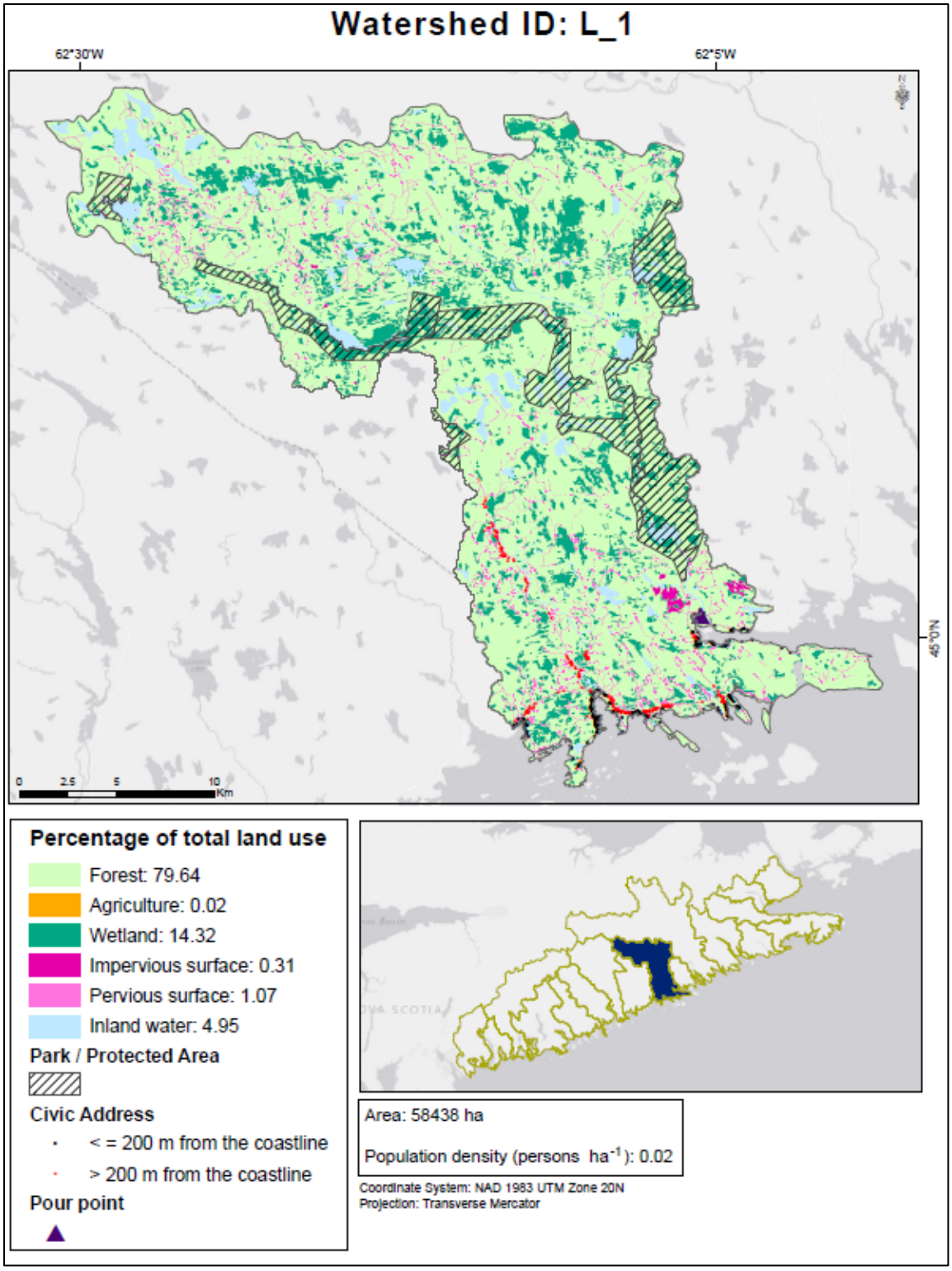


Figure 54. Land-use map for Liscomb watershed L_1. Insets: Watershed area and population density (lower right); location of watershed in relation to the Eastern sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

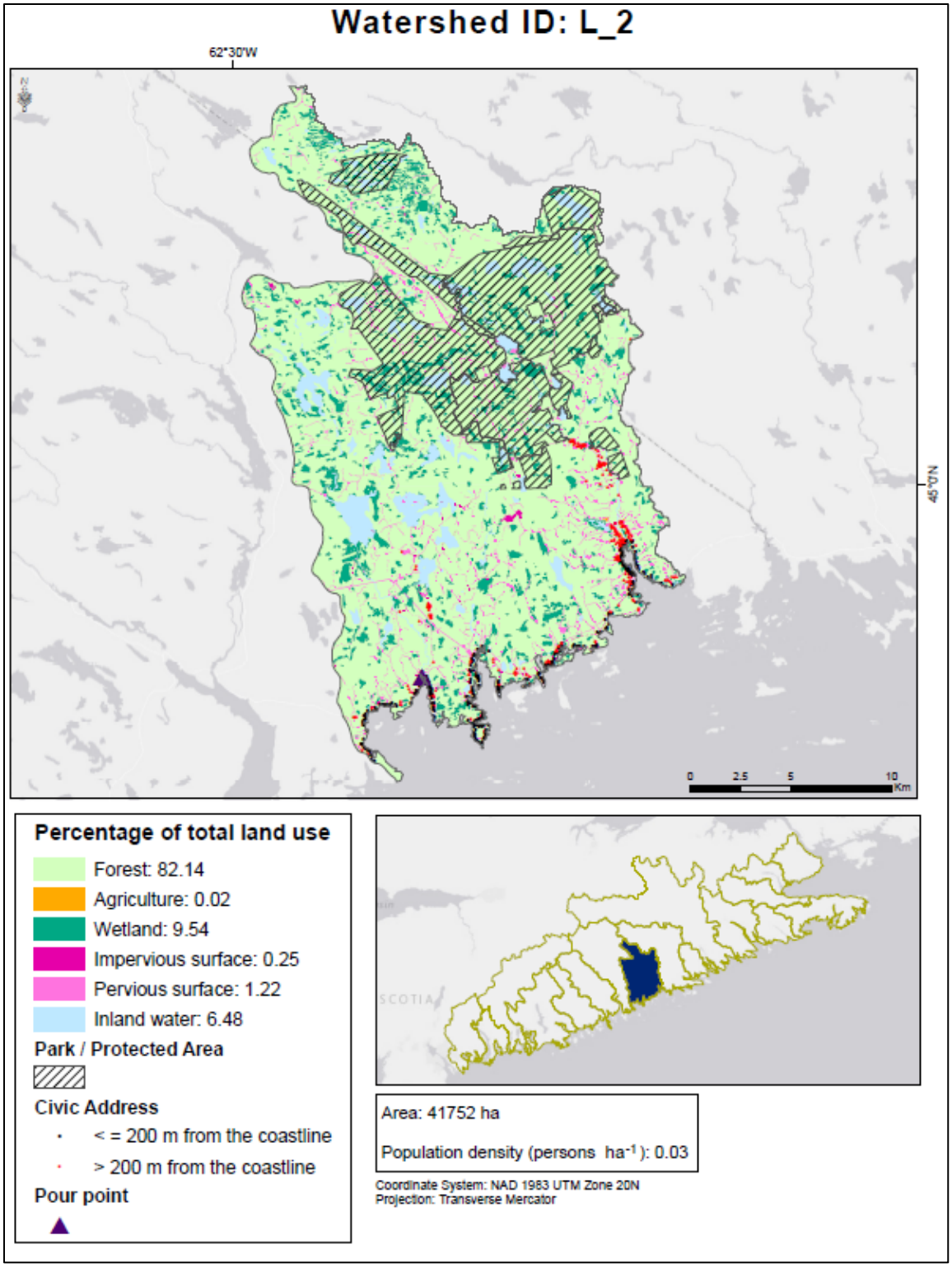


Figure 55. Land-use map for Liscomb watershed L_2. Insets: Watershed area and population density (lower right); location of watershed in relation to the Eastern sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

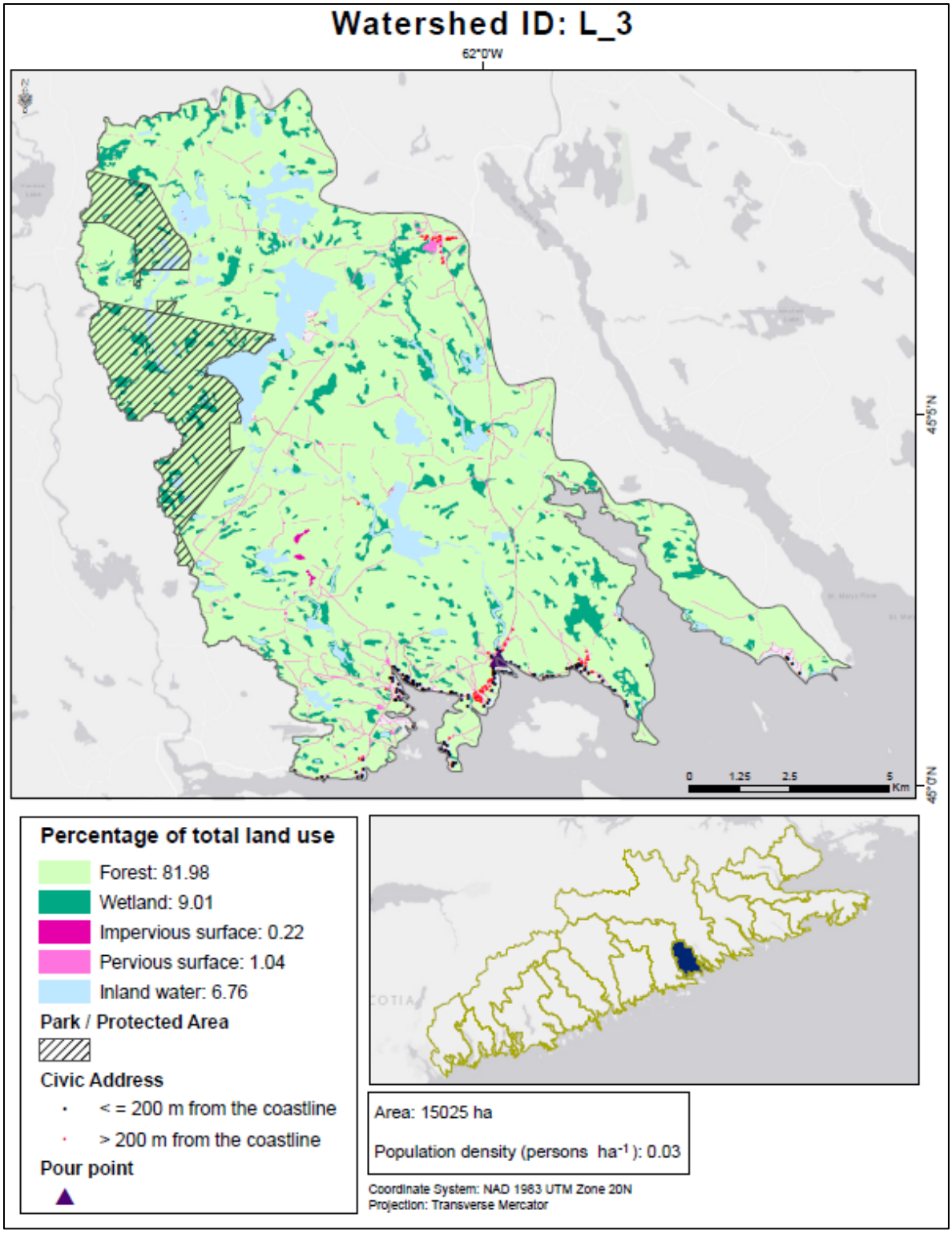


Figure 56. Land-use map for Liscomb watershed L_3. Insets: Watershed area and population density (lower right); location of watershed in relation to the Eastern sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

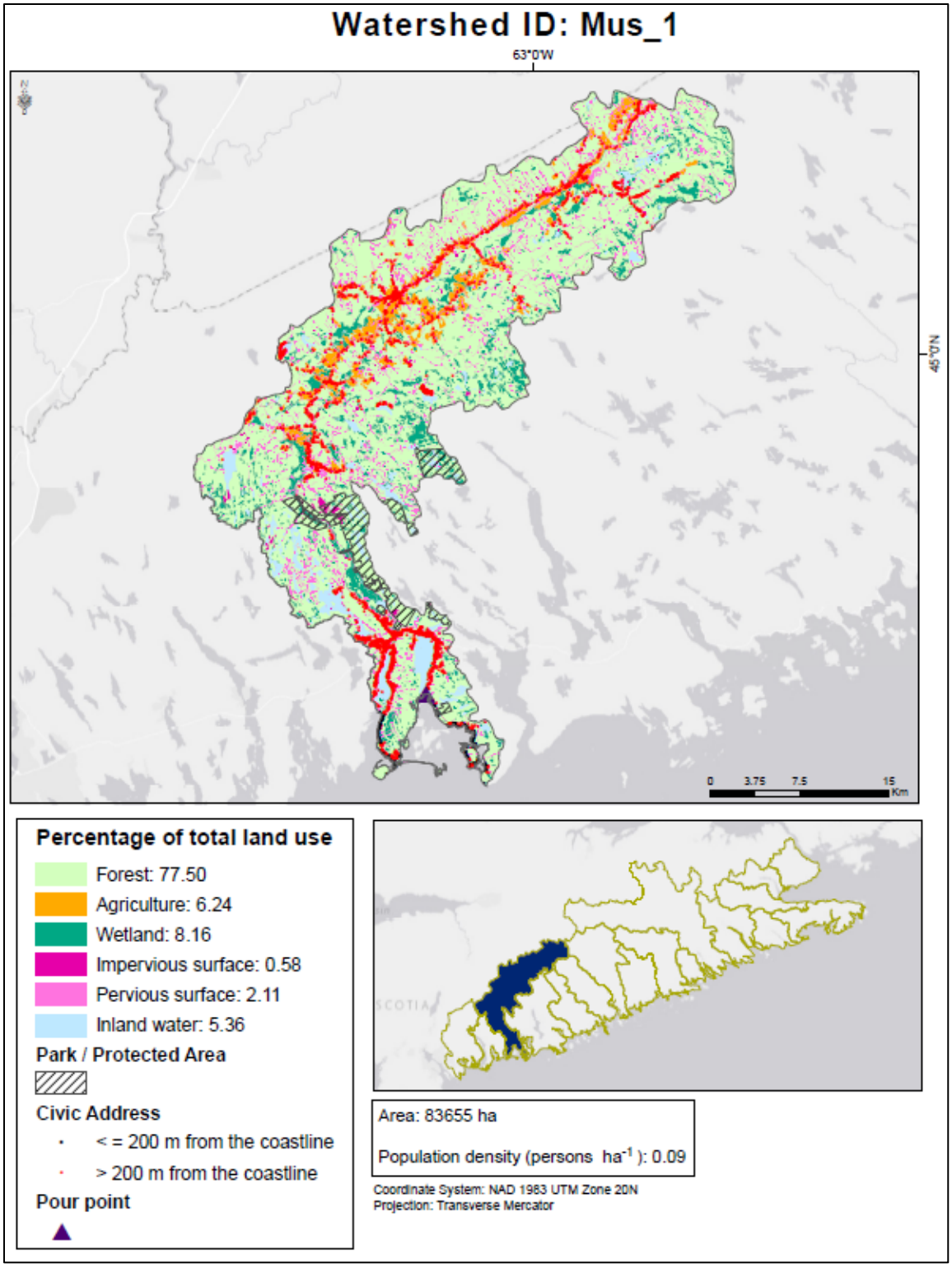


Figure 57. Land-use map for Musquodoboit watershed Mus_1. Insets: Watershed area and population density (lower right); location of watershed in relation to the Eastern sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

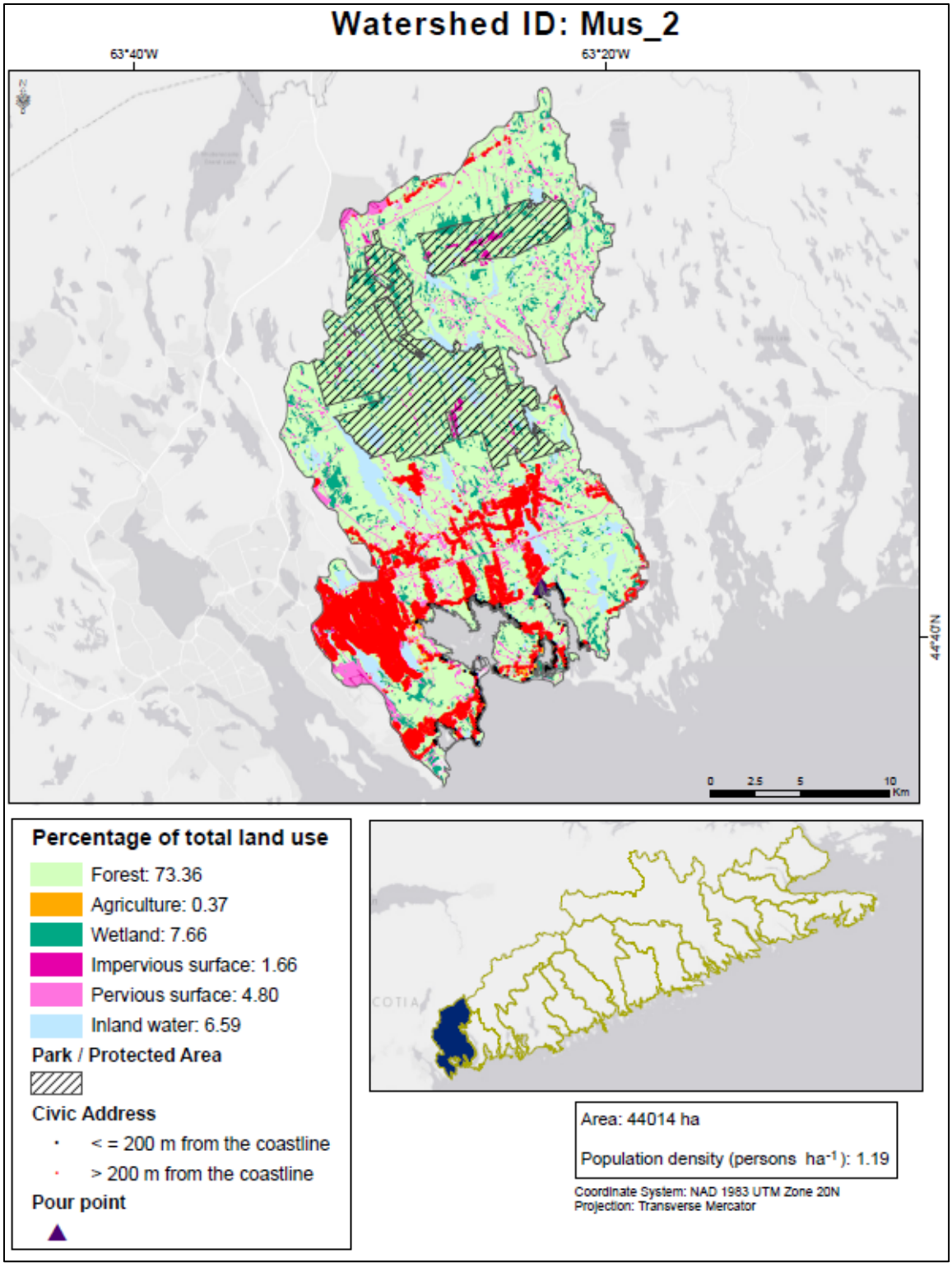


Figure 58. Land-use map for Musquodoboit watershed Mus_2. Insets: Watershed area and population density (lower right); location of watershed in relation to the Eastern sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

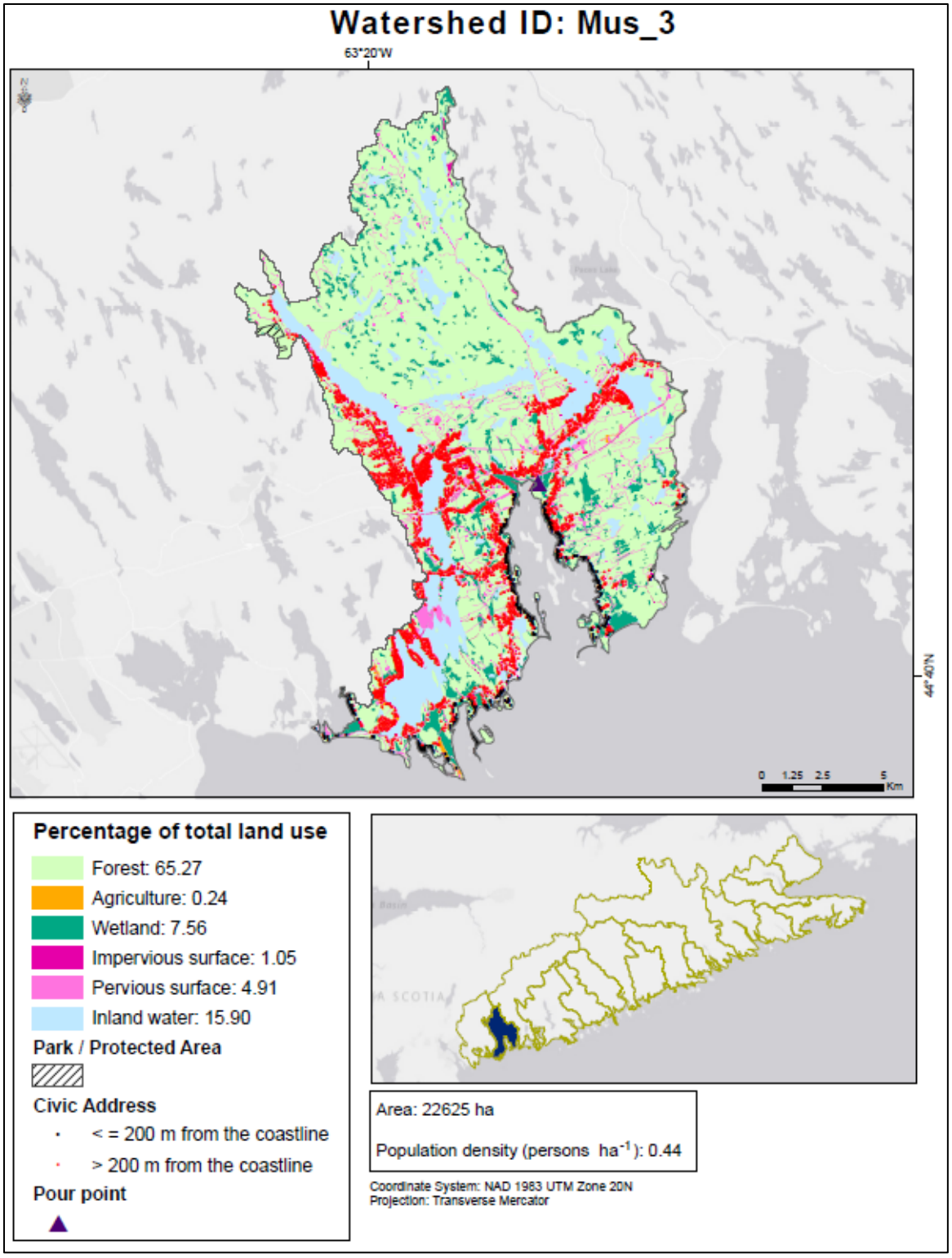


Figure 59. Land-use map for Musquodoboit watershed Mus_3. Insets: Watershed area and population density (lower right); location of watershed in relation to the Eastern sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

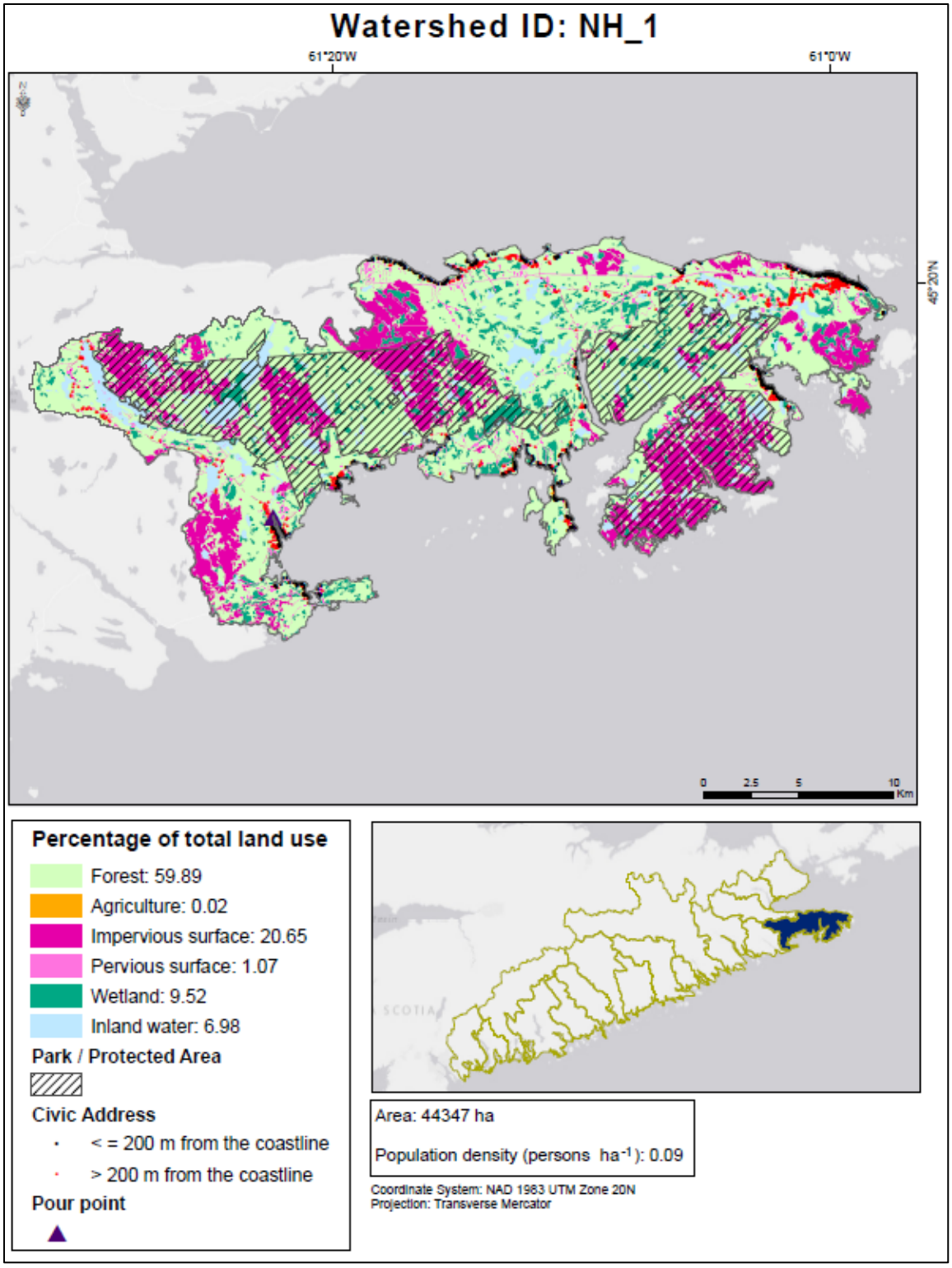


Figure 60. Land-use map for New Harbour watershed NH_1. Insets: Watershed area and population density (lower right); location of watershed in relation to the Eastern sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

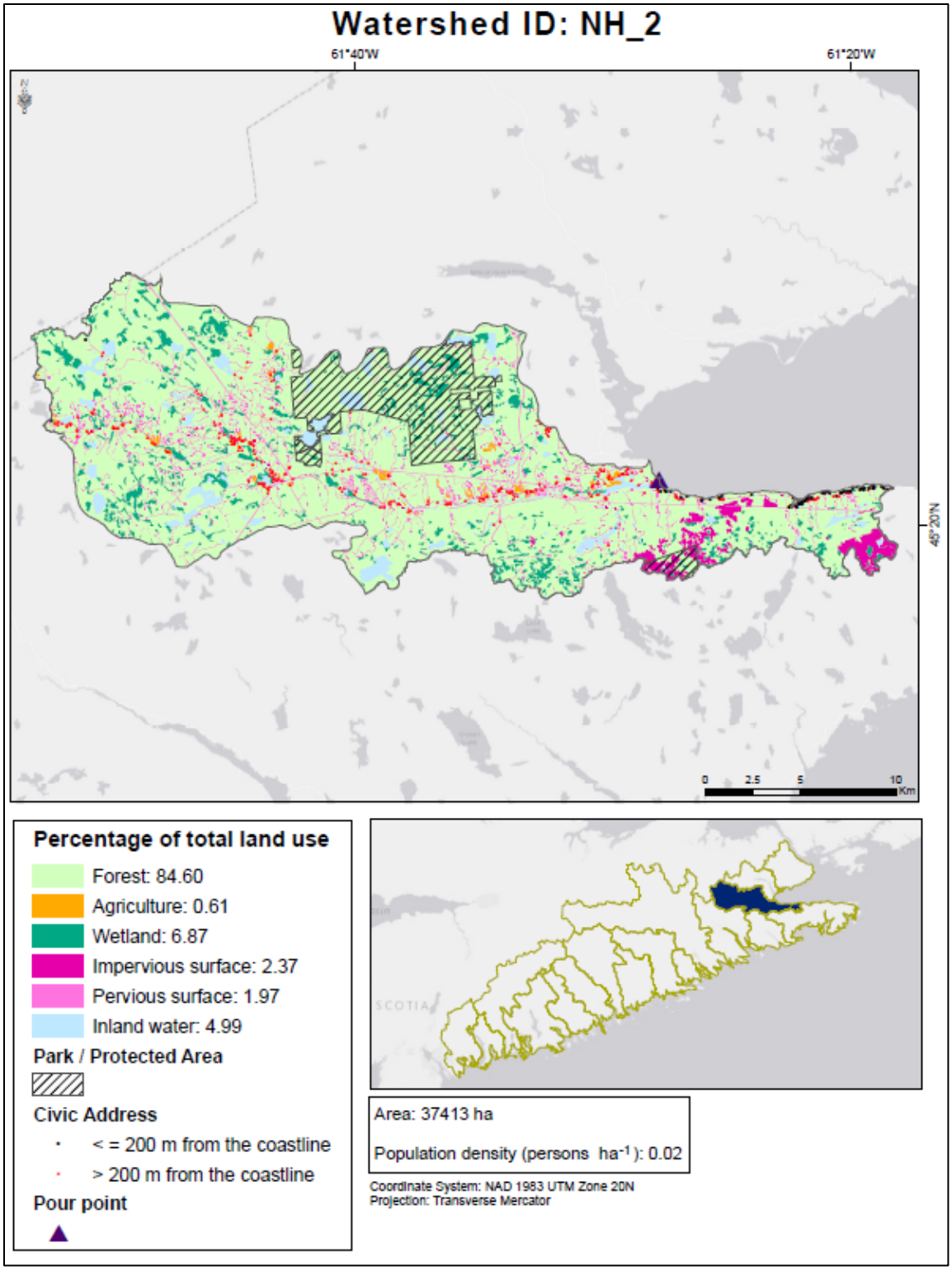


Figure 61. Land-use map for New Harbour watershed NH_2. Insets: Watershed area and population density (lower right); location of watershed in relation to the Eastern sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

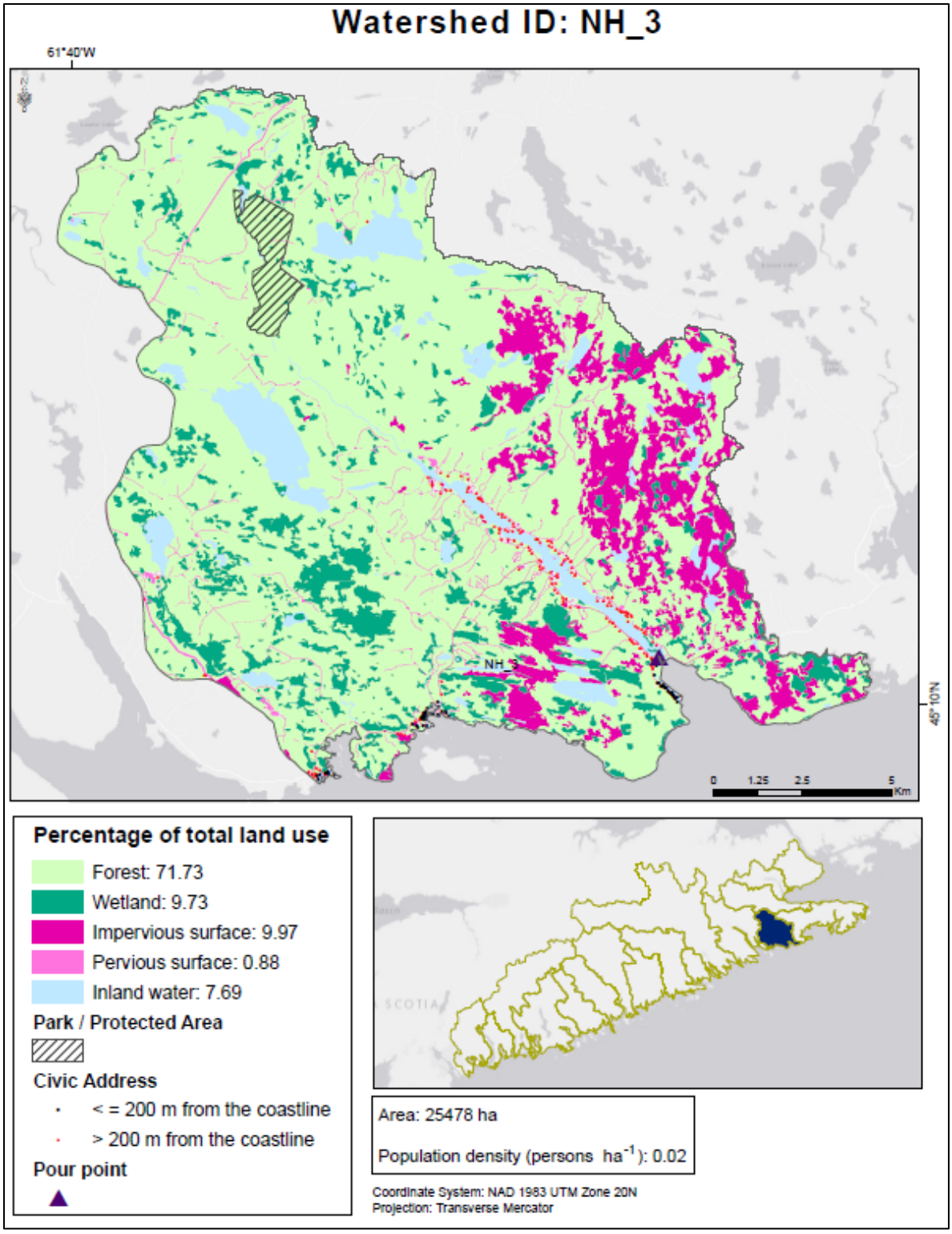


Figure 62. Land-use map for New Harbour watershed NH_3. Insets: Watershed area and population density (lower right); location of watershed in relation to the Eastern sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

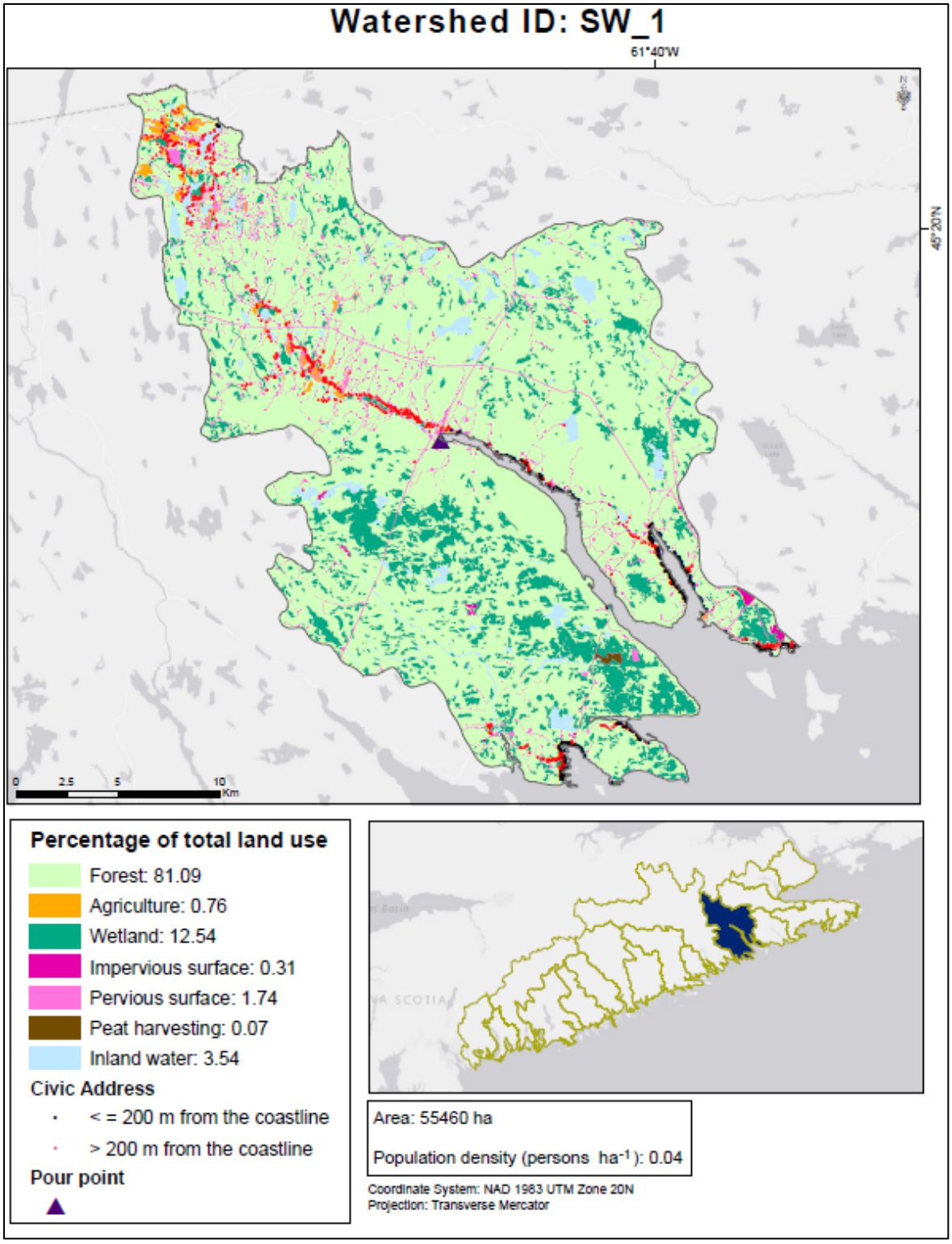


Figure 63. Land-use map for South and West Antigonish watershed SW_1. Insets: Watershed area and population density (lower right); location of watershed in relation to the Eastern sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

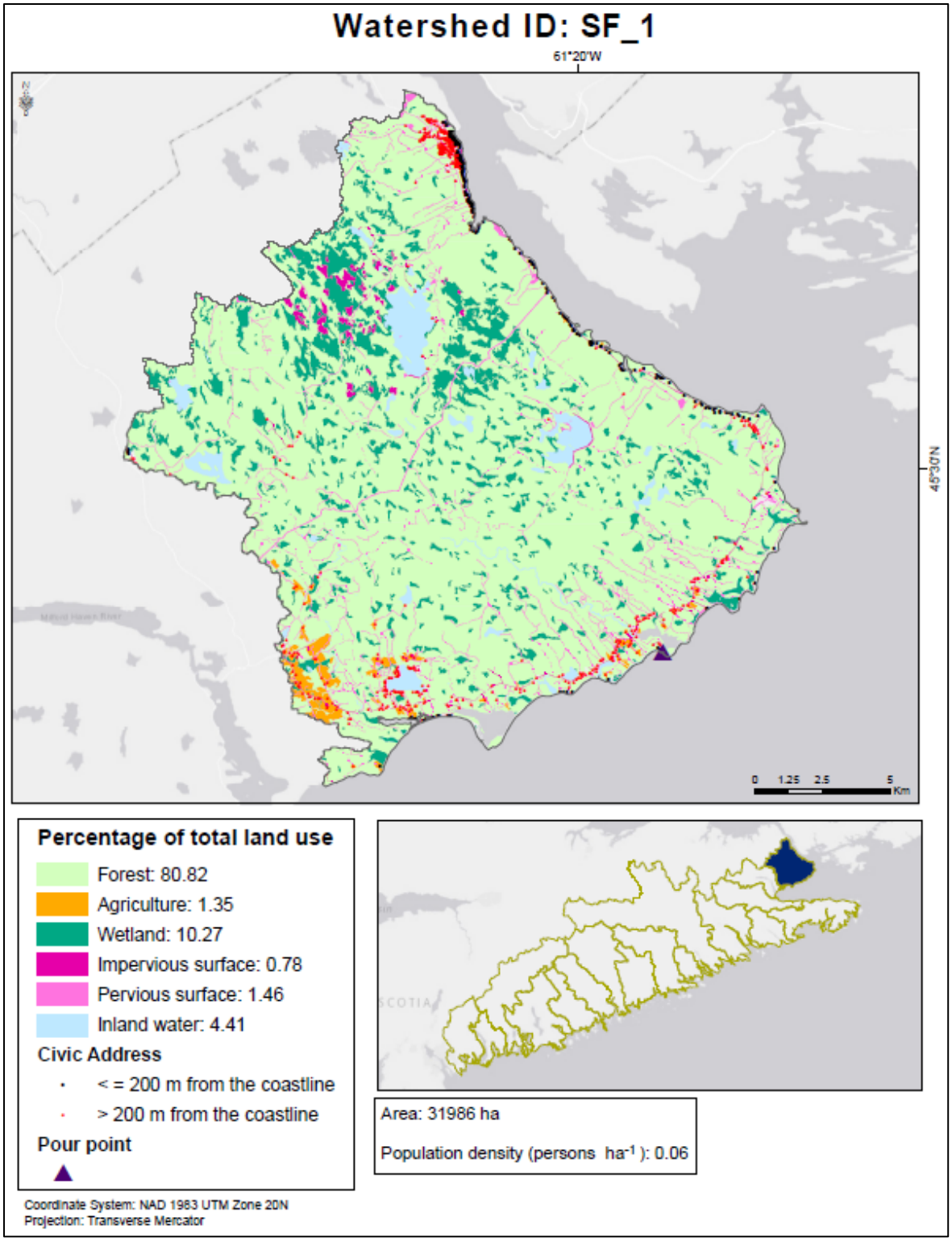


Figure 64. Land-use map for St. Francis Harbour watershed SF_1. Insets: Watershed area and population density (lower right); location of watershed in relation to the Eastern sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

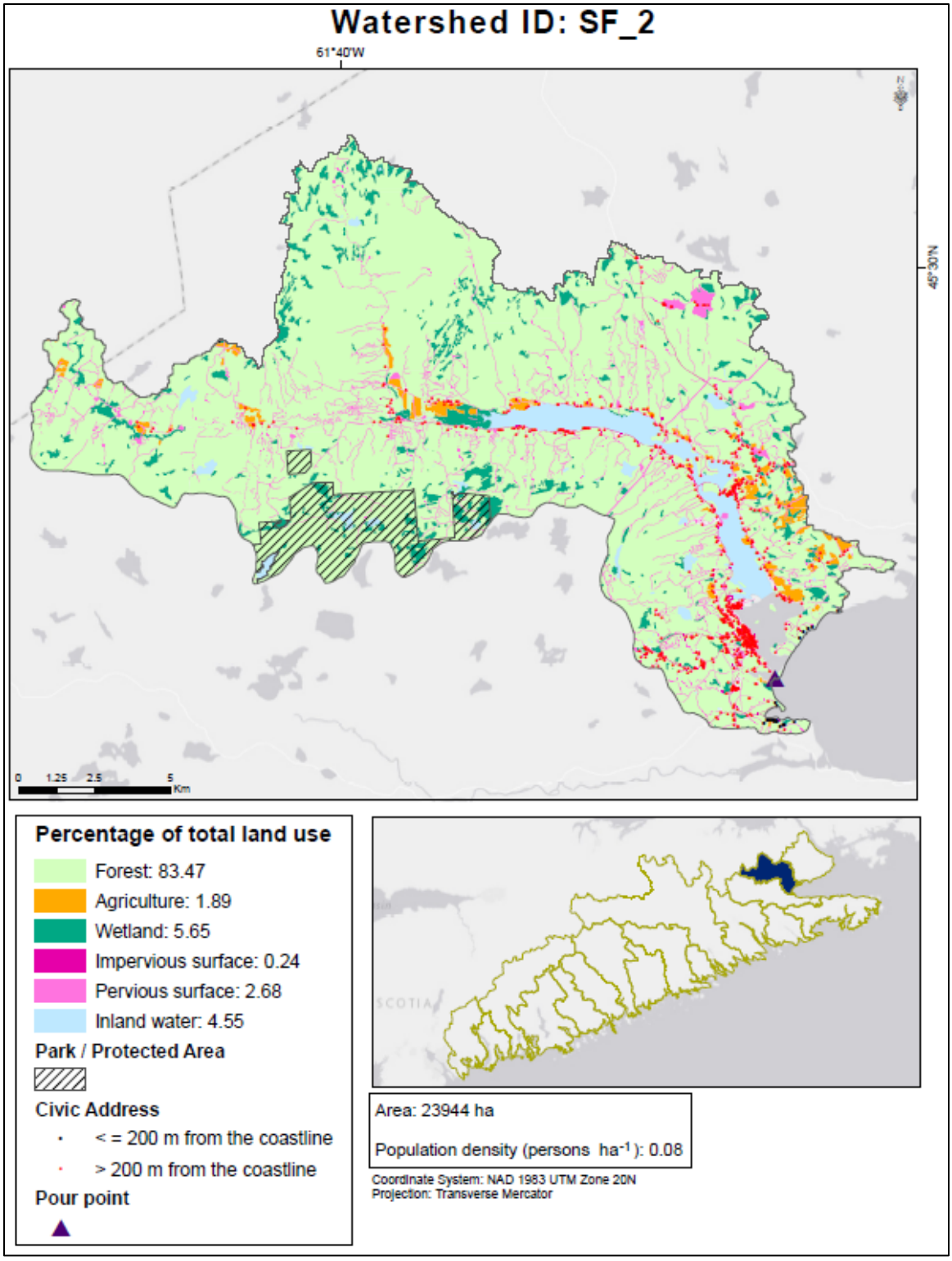


Figure 65. Land-use map for St. Francis Harbour watershed SF_2. Insets: Watershed area and population density (lower right); location of watershed in relation to the Eastern sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

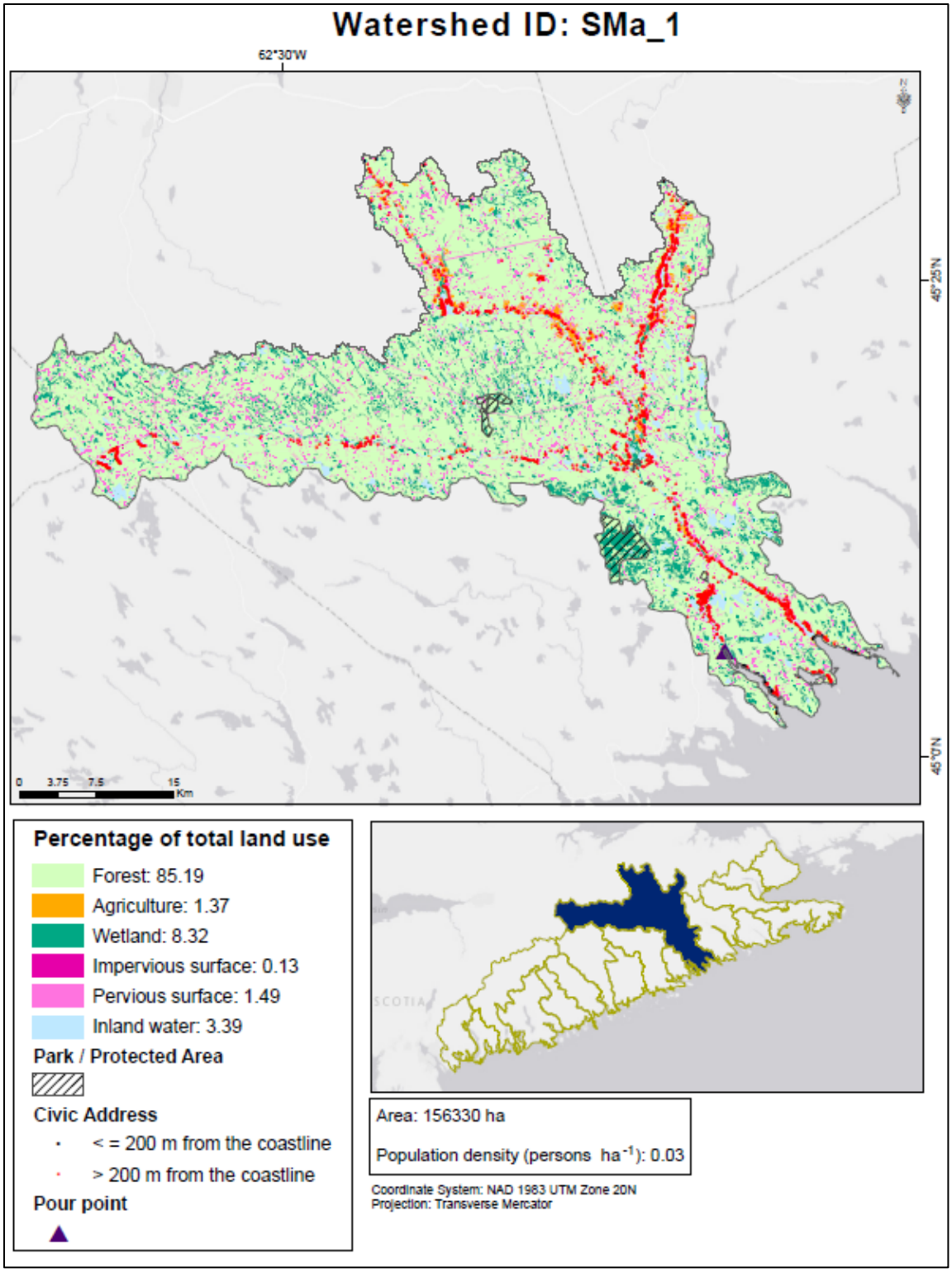


Figure 66. Land-use map for St. Marys watershed SMa_1. Insets: Watershed area and population density (lower right); location of watershed in relation to the Eastern sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

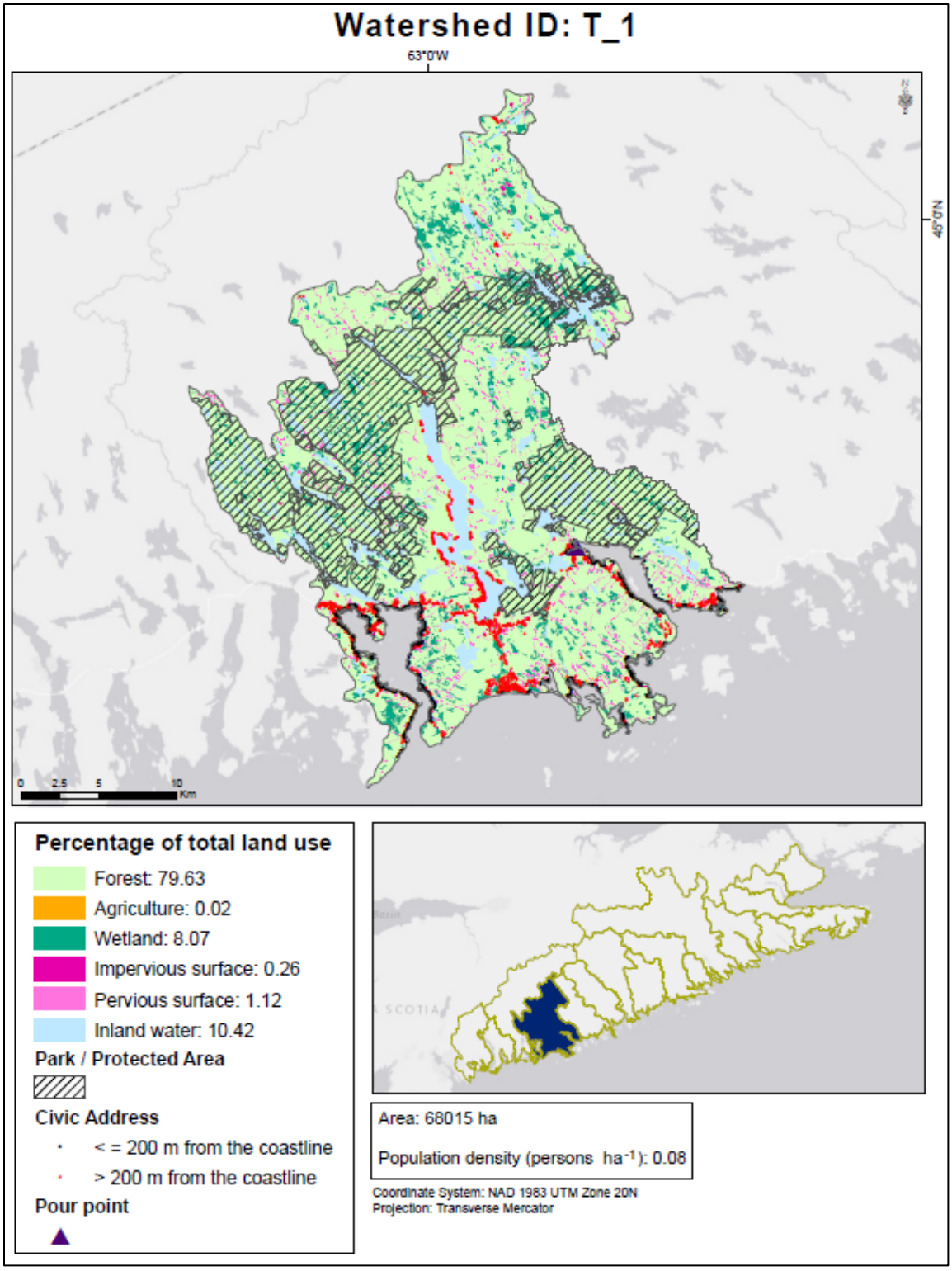


Figure 67. Land-use map for Tangier watershed T_1. Insets: Watershed area and population density (lower right); location of watershed in relation to the Eastern sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

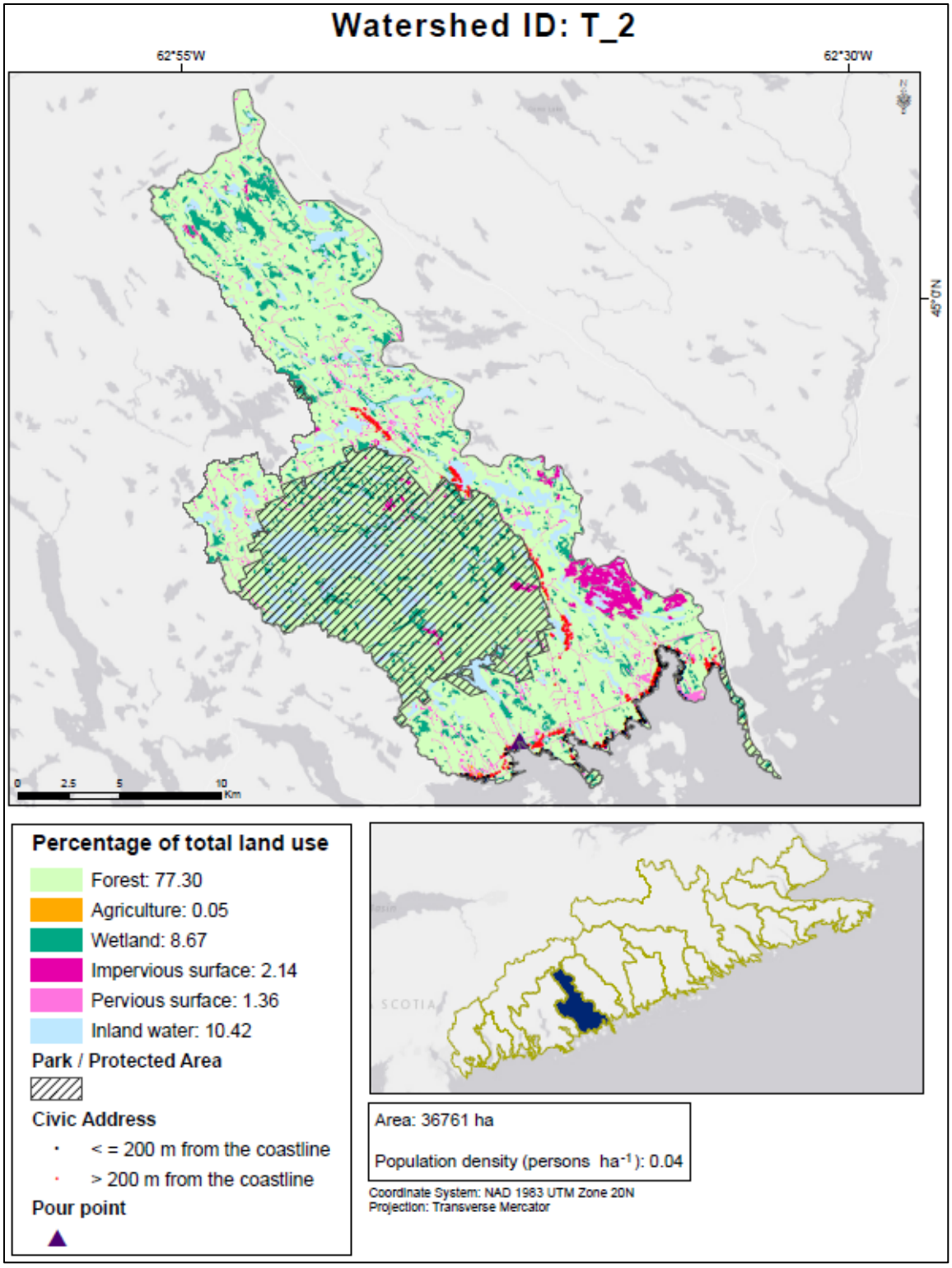


Figure 68. Land-use map for Tangier watershed T_2. Insets: Watershed area and population density (lower right); location of watershed in relation to the Eastern sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

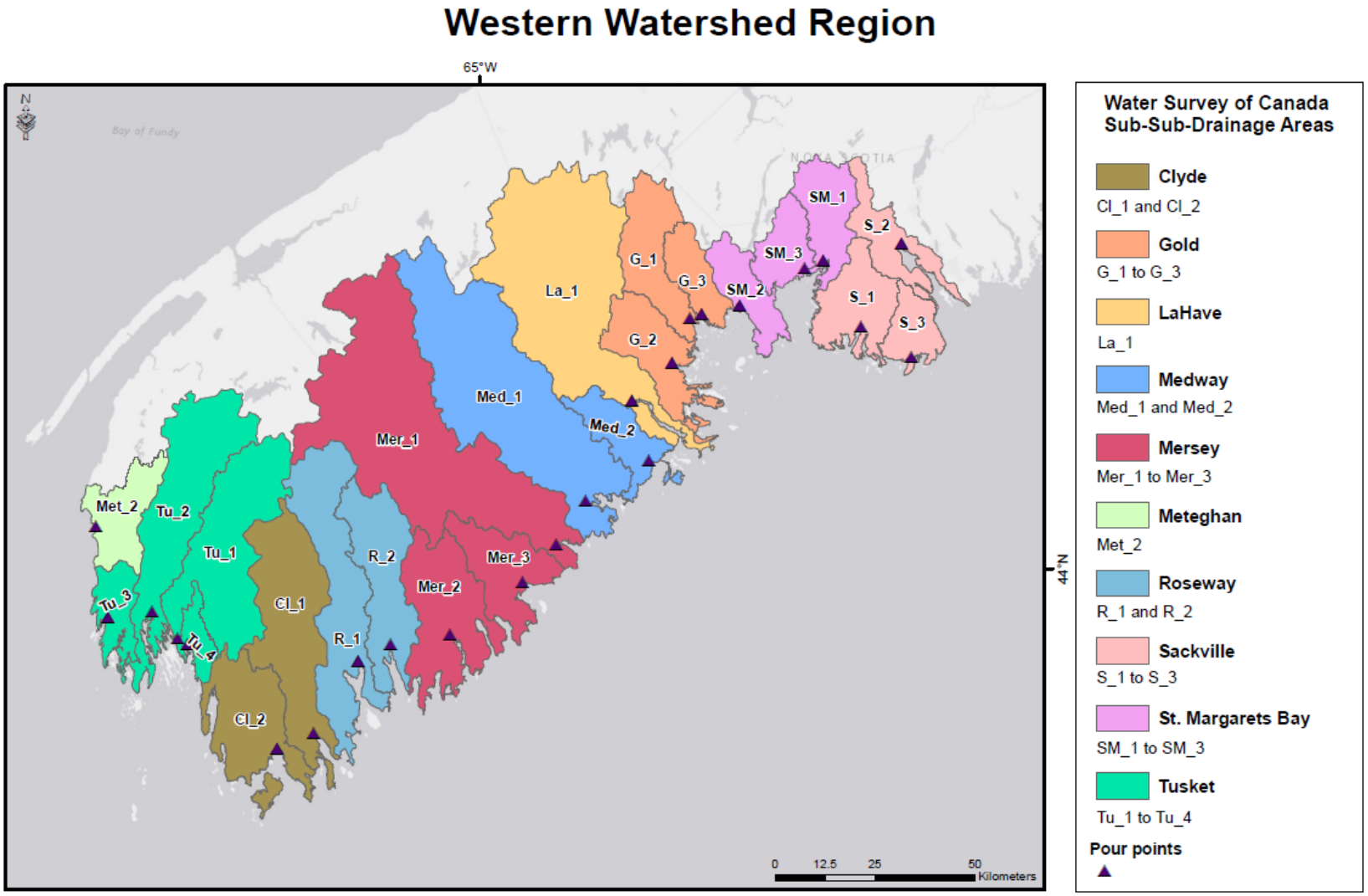


Figure 69. Western sub-region, displaying ten Water Survey of Canada sub-sub-drainage areas (denoted by differing colours) and their associated watersheds. Black triangles represent the major pour points (largest outlets into the coastal zone).

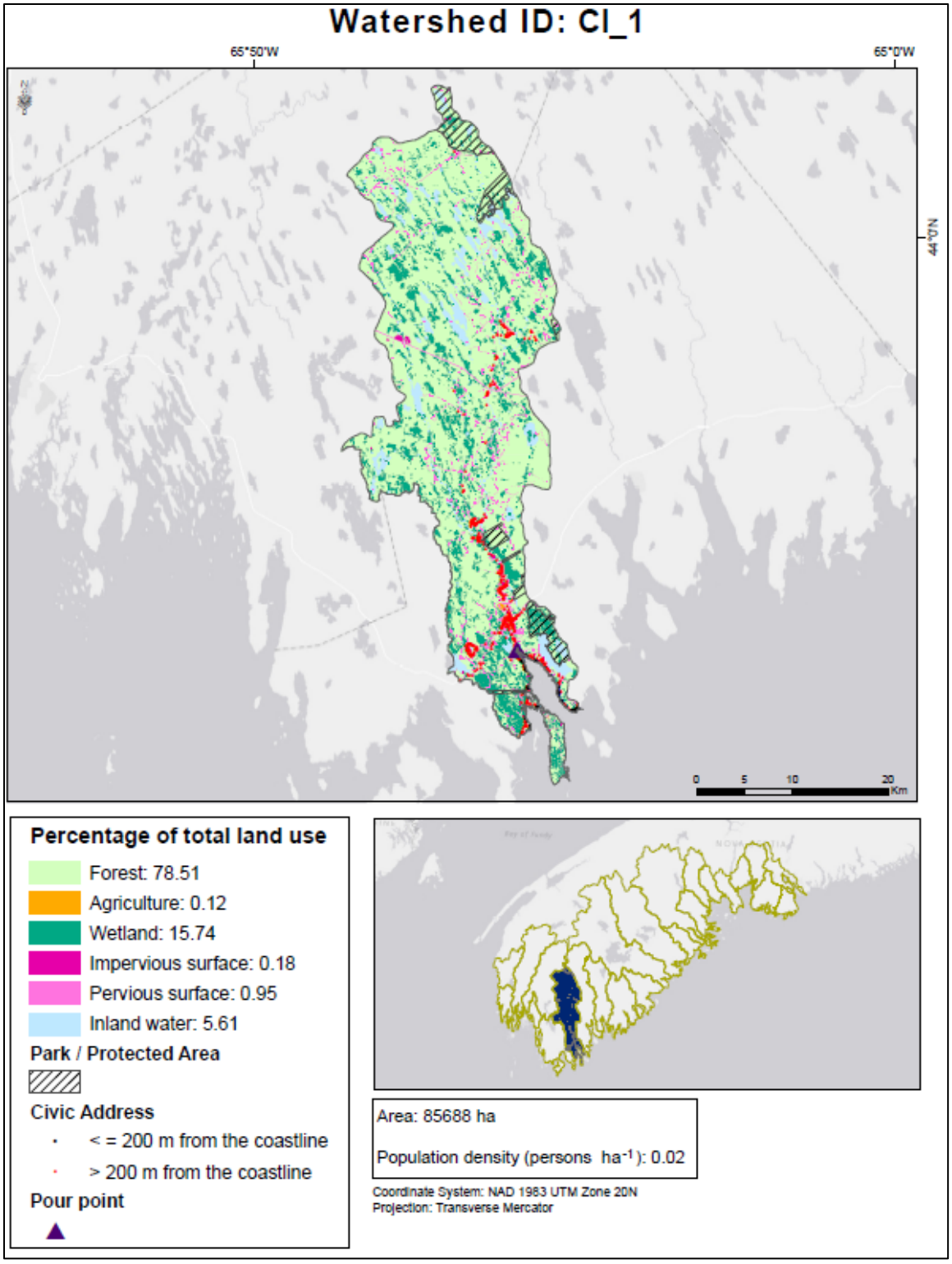


Figure 70. Land-use map for Clyde watershed Cl_1. Insets: Watershed area and population density (lower right); location of watershed in relation to the Western sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

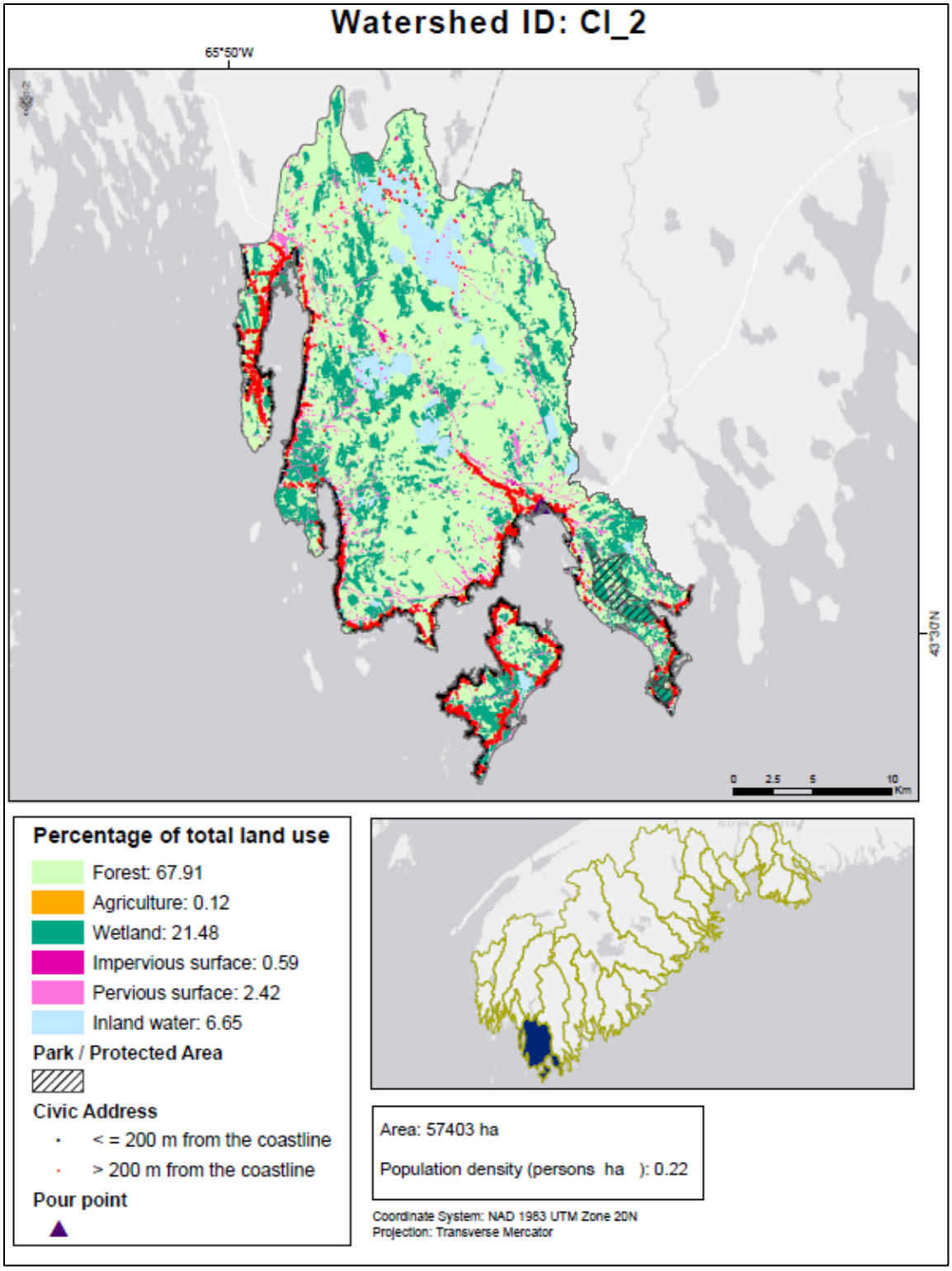


Figure 71. Land-use map for Clyde watershed Cl_2. Insets: Watershed area and population density (lower right); location of watershed in relation to the Western sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

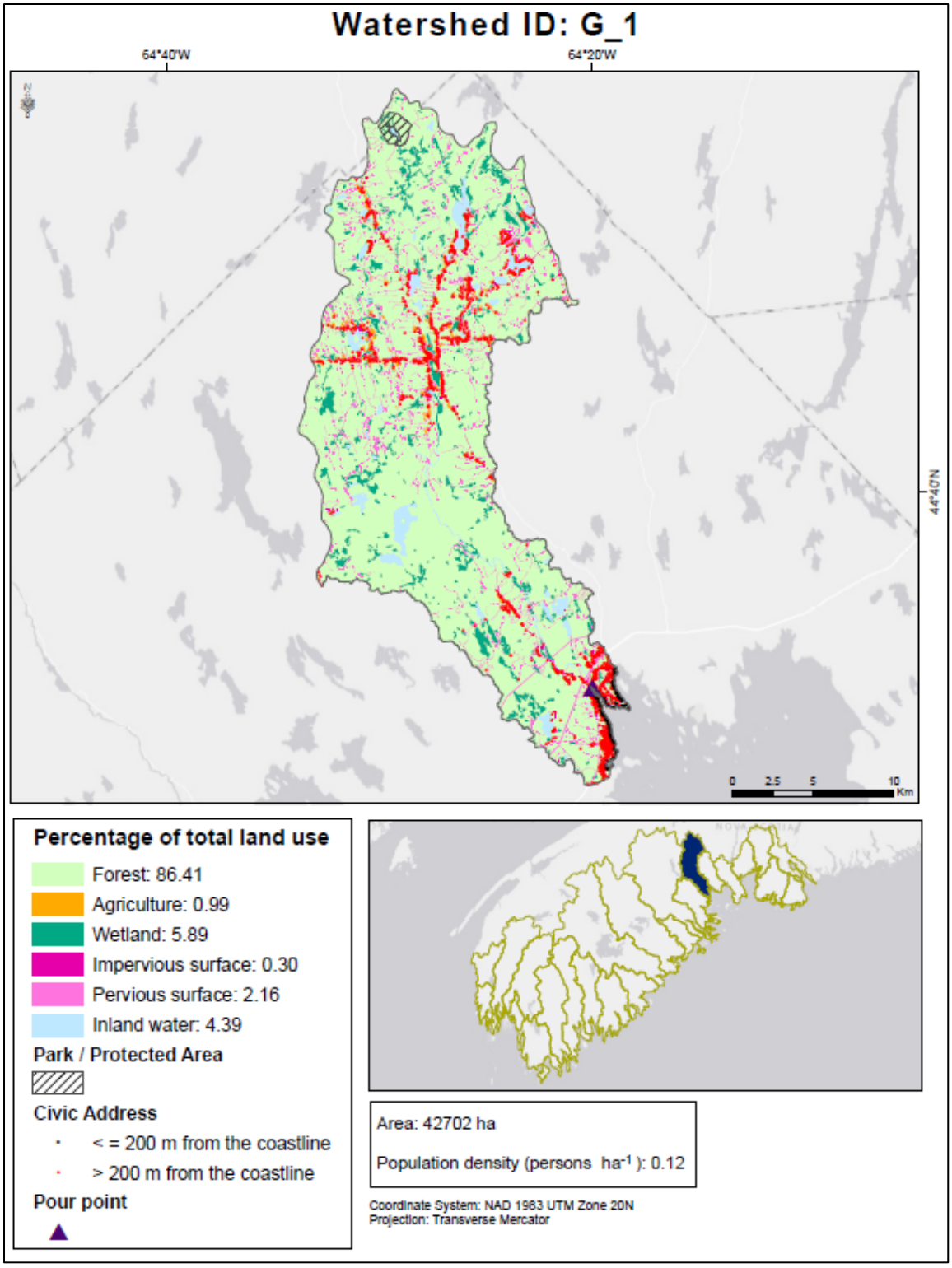


Figure 72. Land-use map for Gold watershed G_1. Insets: Watershed area and population density (lower right); location of watershed in relation to the Western sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

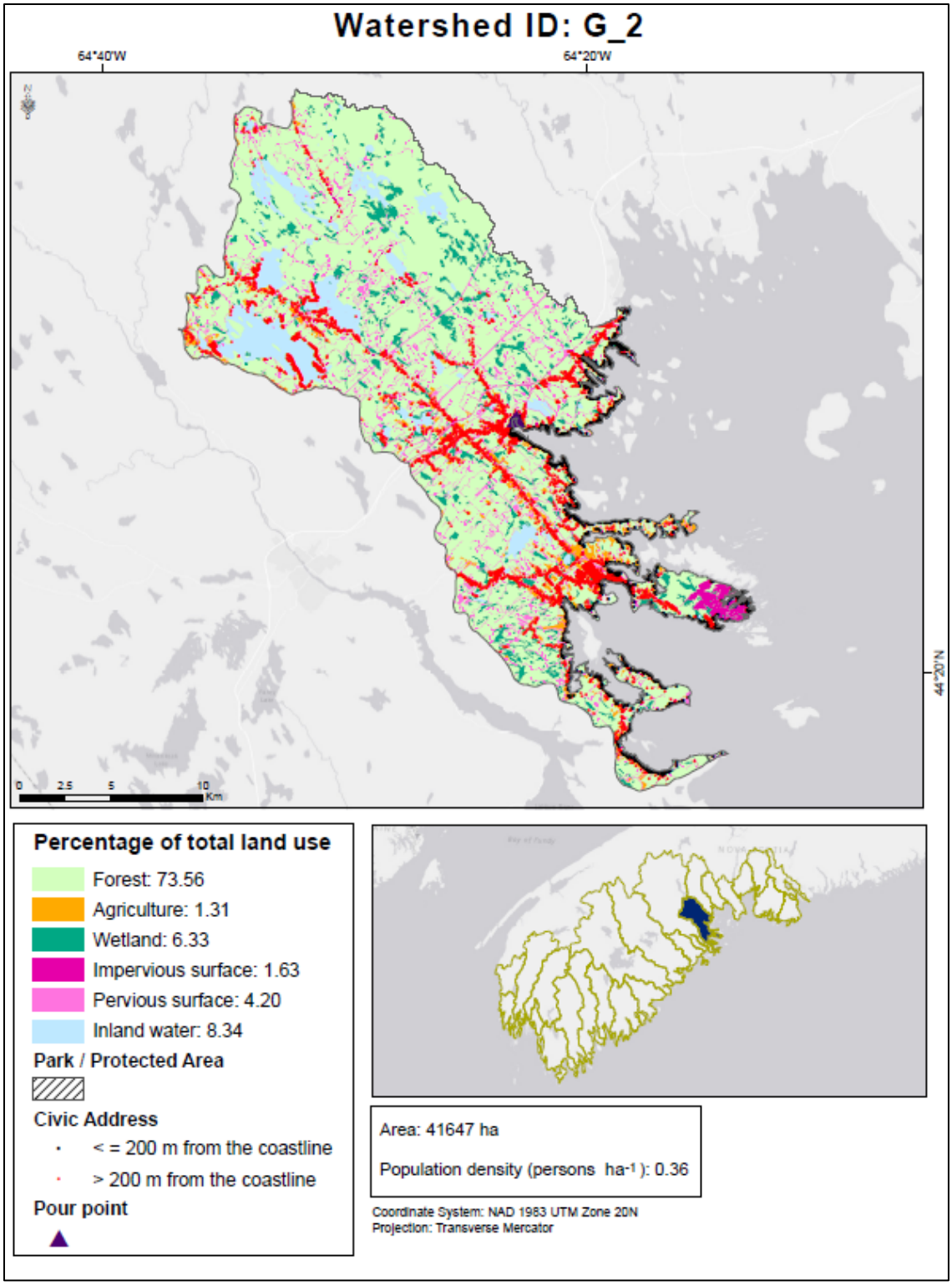


Figure 73. Land-use map for Gold watershed G_2. Insets: Watershed area and population density (lower right); location of watershed in relation to the Western sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

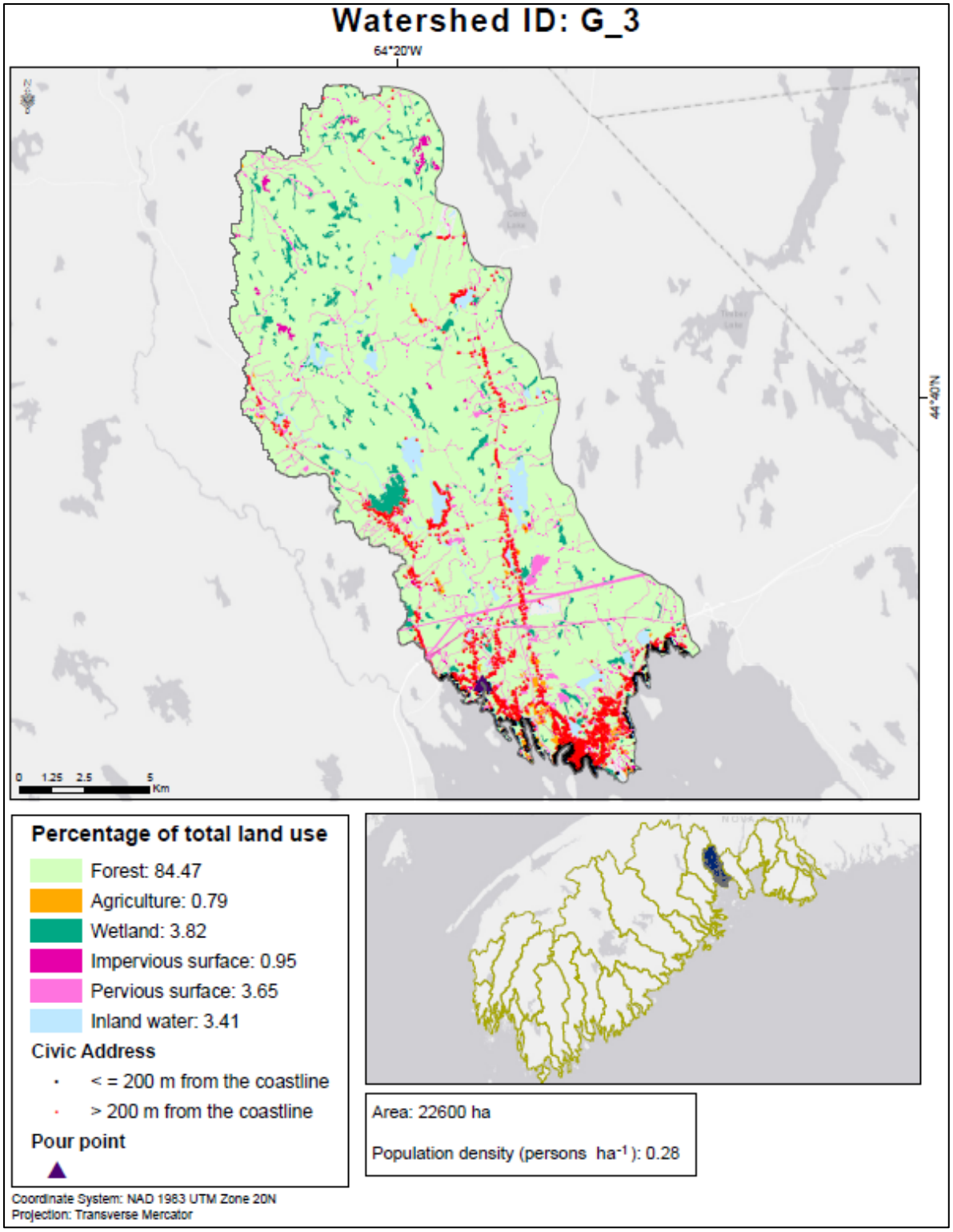


Figure 74. Land-use map for Gold watershed G_3. Insets: Watershed area and population density (lower right); location of watershed in relation to the Western sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

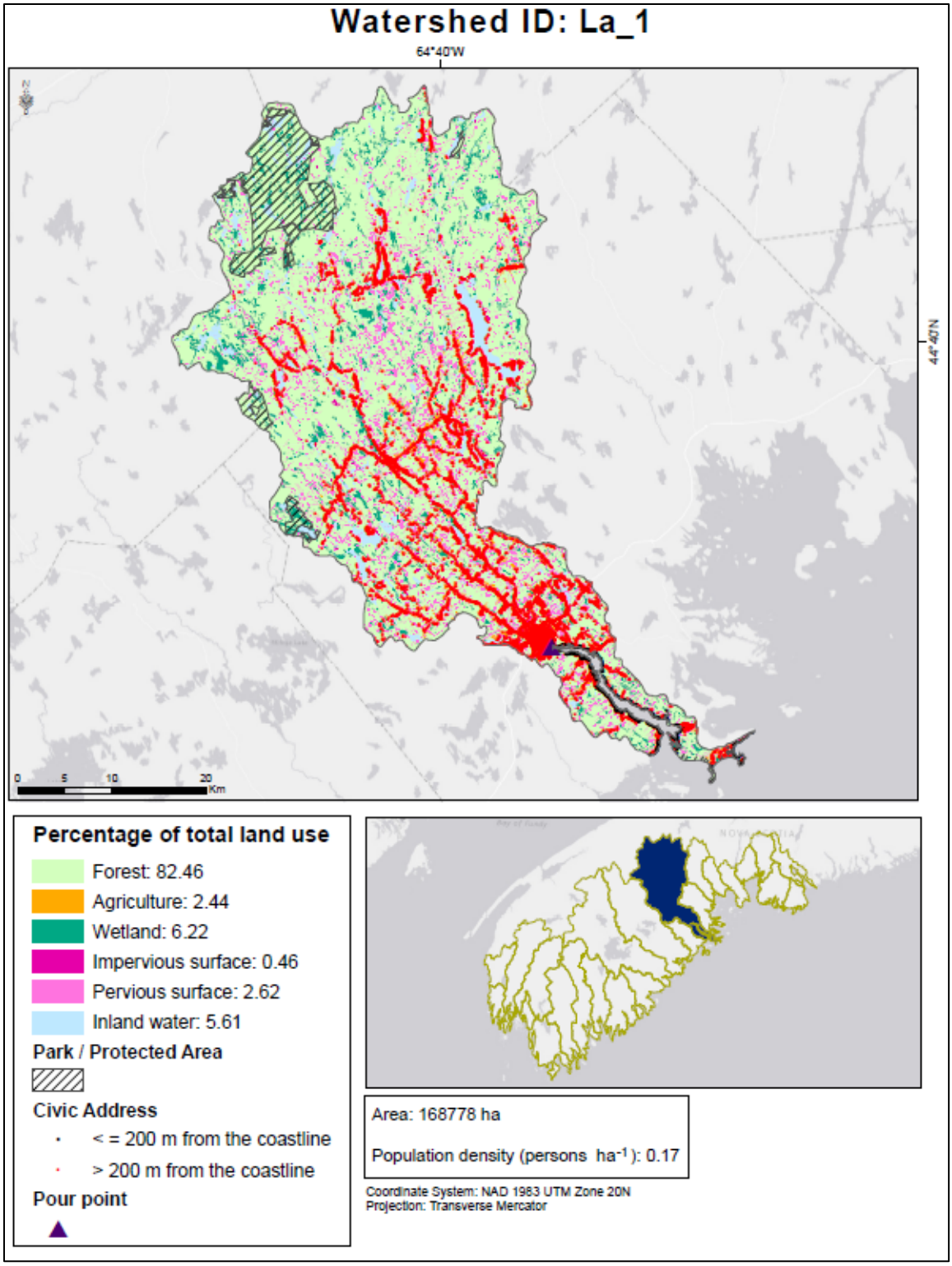


Figure 75. Land-use map for LaHave watershed La_1. Insets: Watershed area and population density (lower right); location of watershed in relation to the Western sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

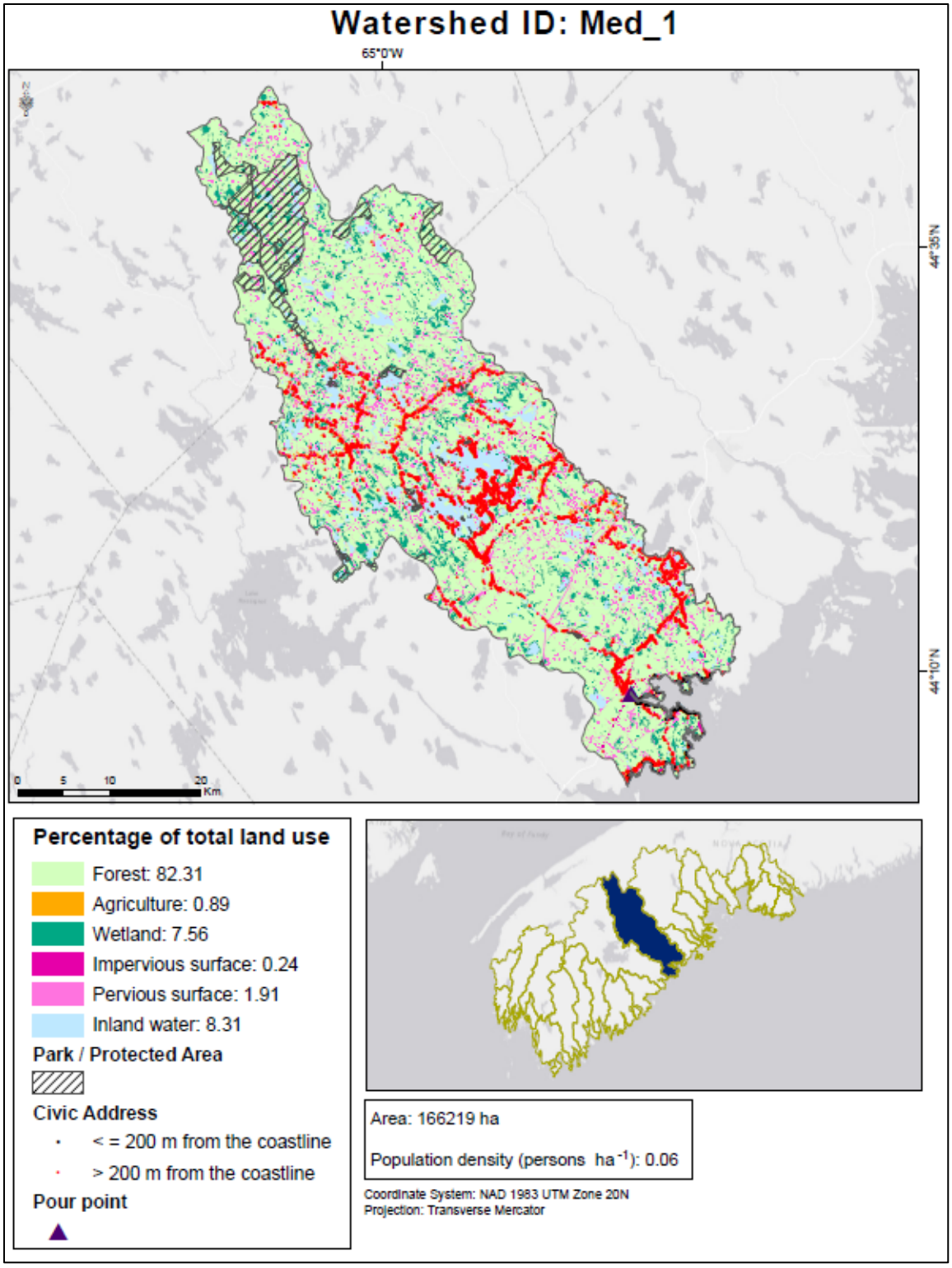


Figure 76. Land-use map for Medway watershed Med_1. Insets: Watershed area and population density (lower right); location of watershed in relation to the Western sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

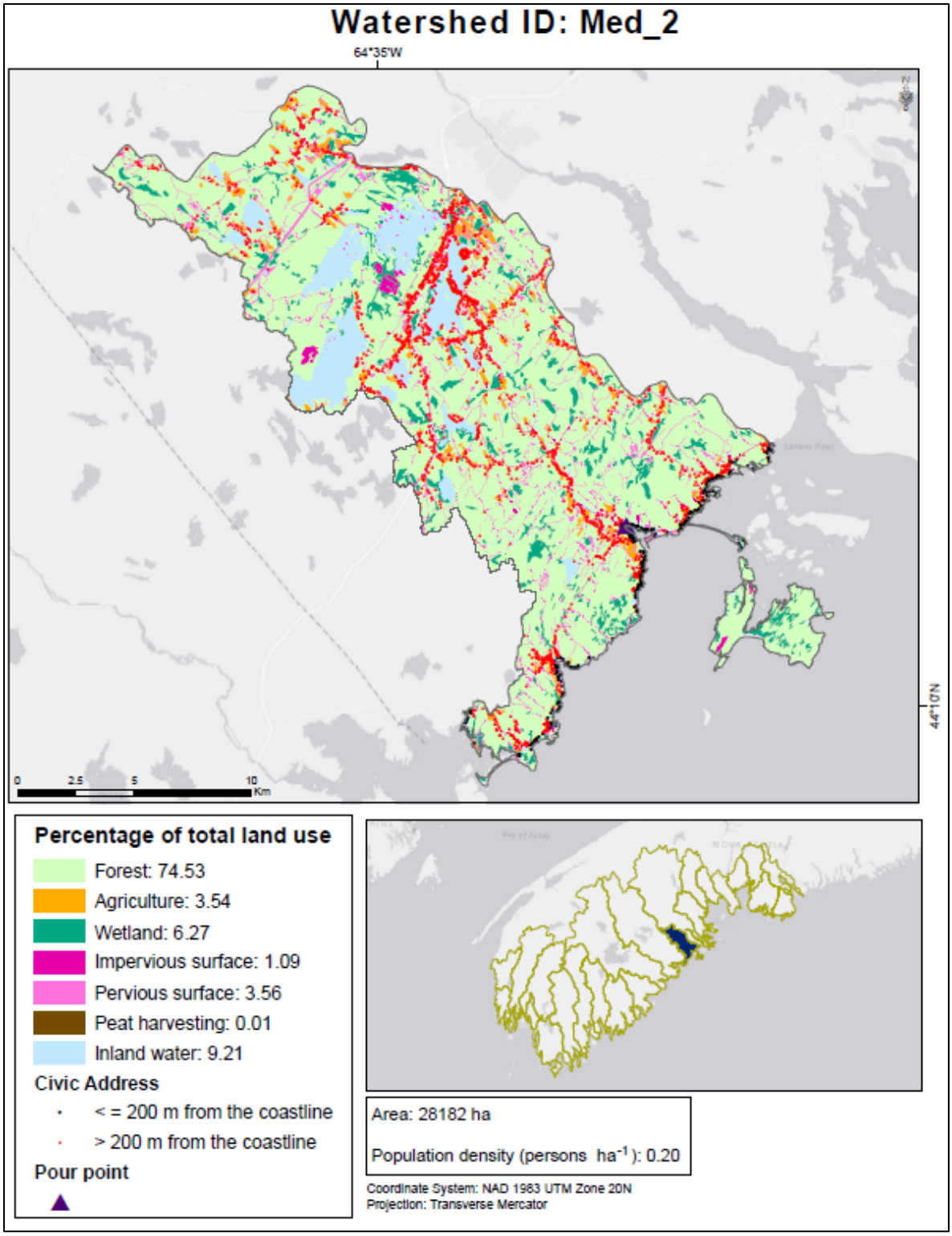


Figure 77. Land-use map for Medway watershed Med_2. Insets: Watershed area and population density (lower right); location of watershed in relation to the Western sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

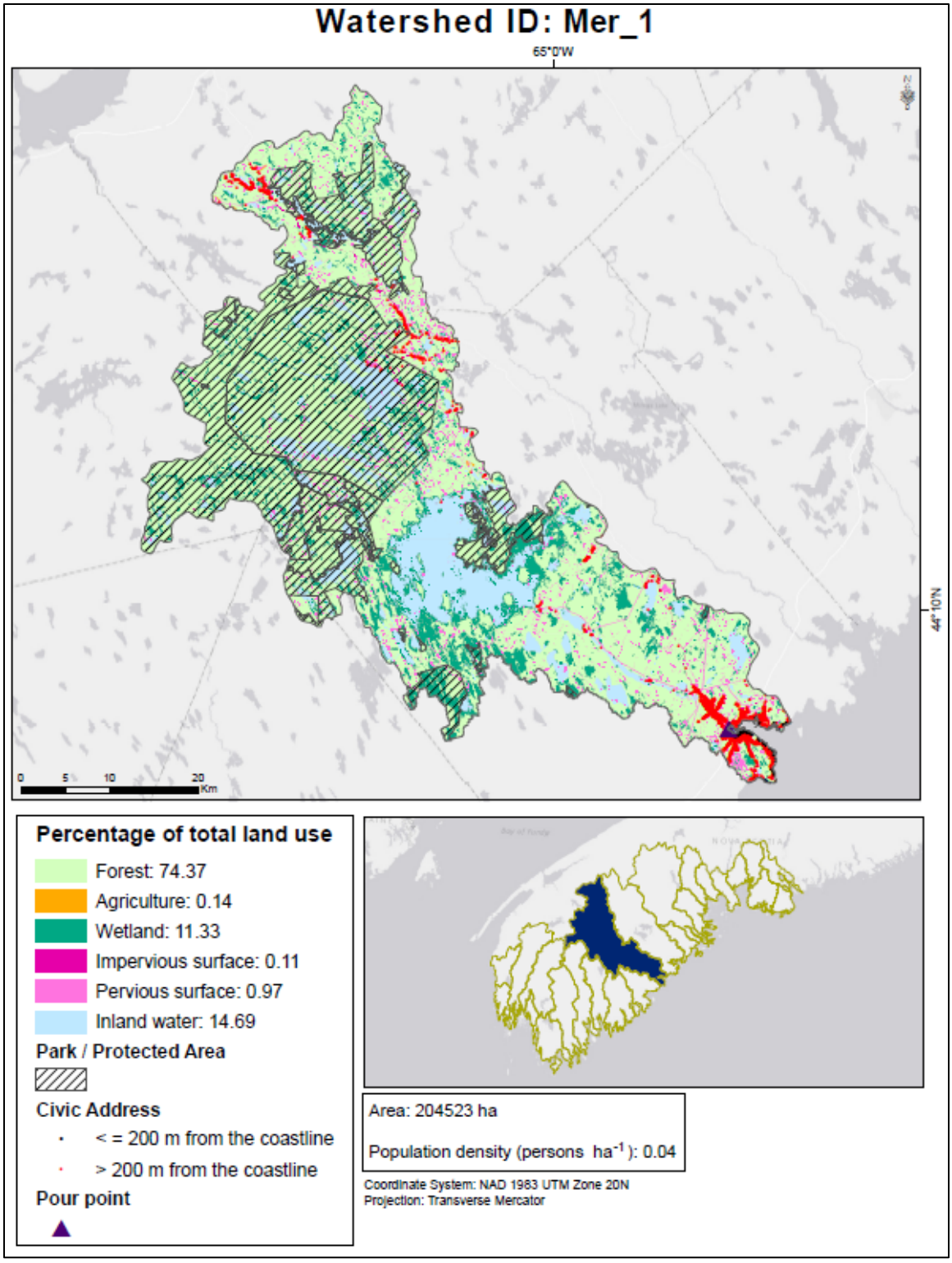


Figure 78. Land-use map for Mersey watershed Mer_1. Insets: Watershed area and population density (lower right); location of watershed in relation to the Western sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

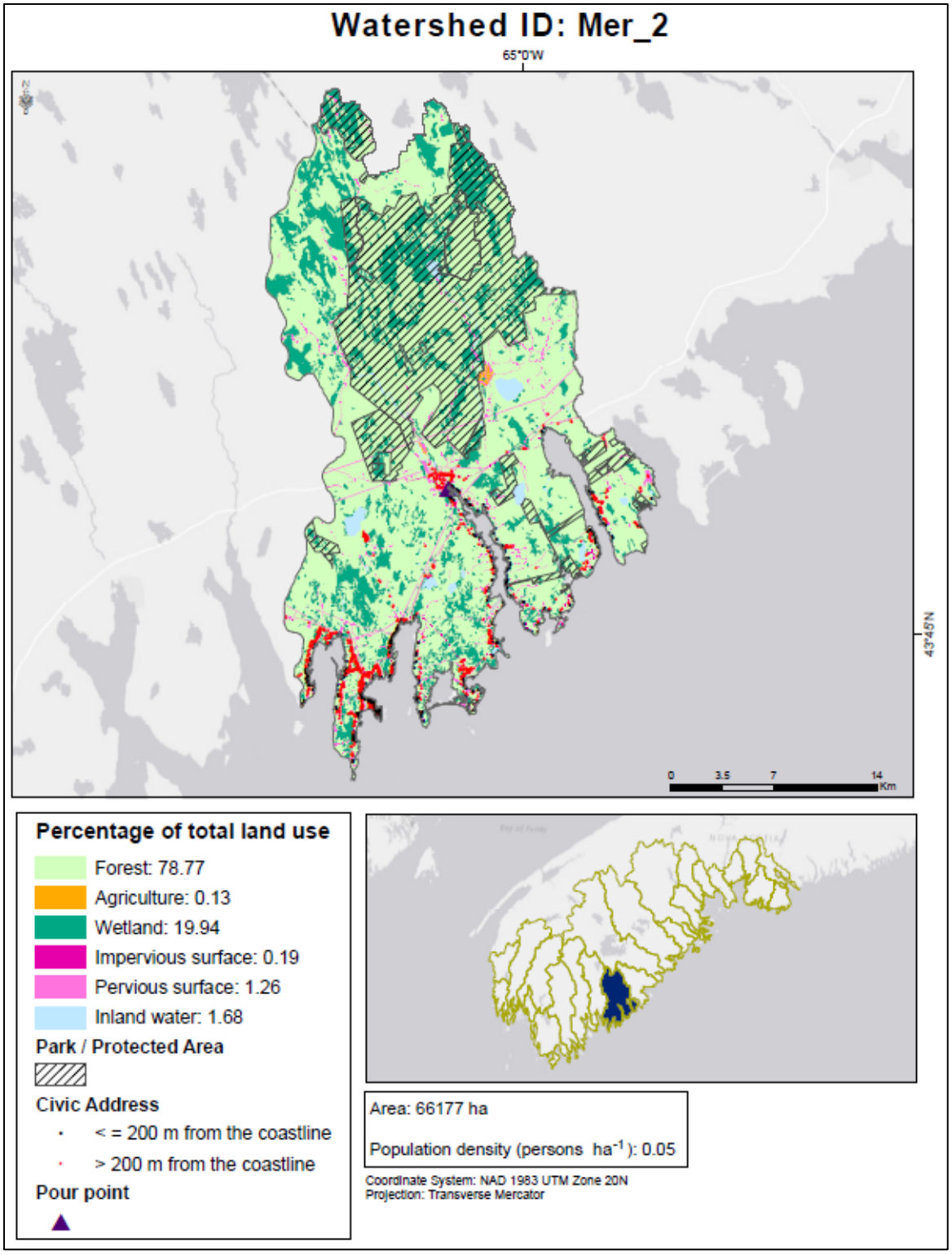


Figure 79. Land-use map for Mersey watershed Mer_2. Insets: Watershed area and population density (lower right); location of watershed in relation to the Western sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

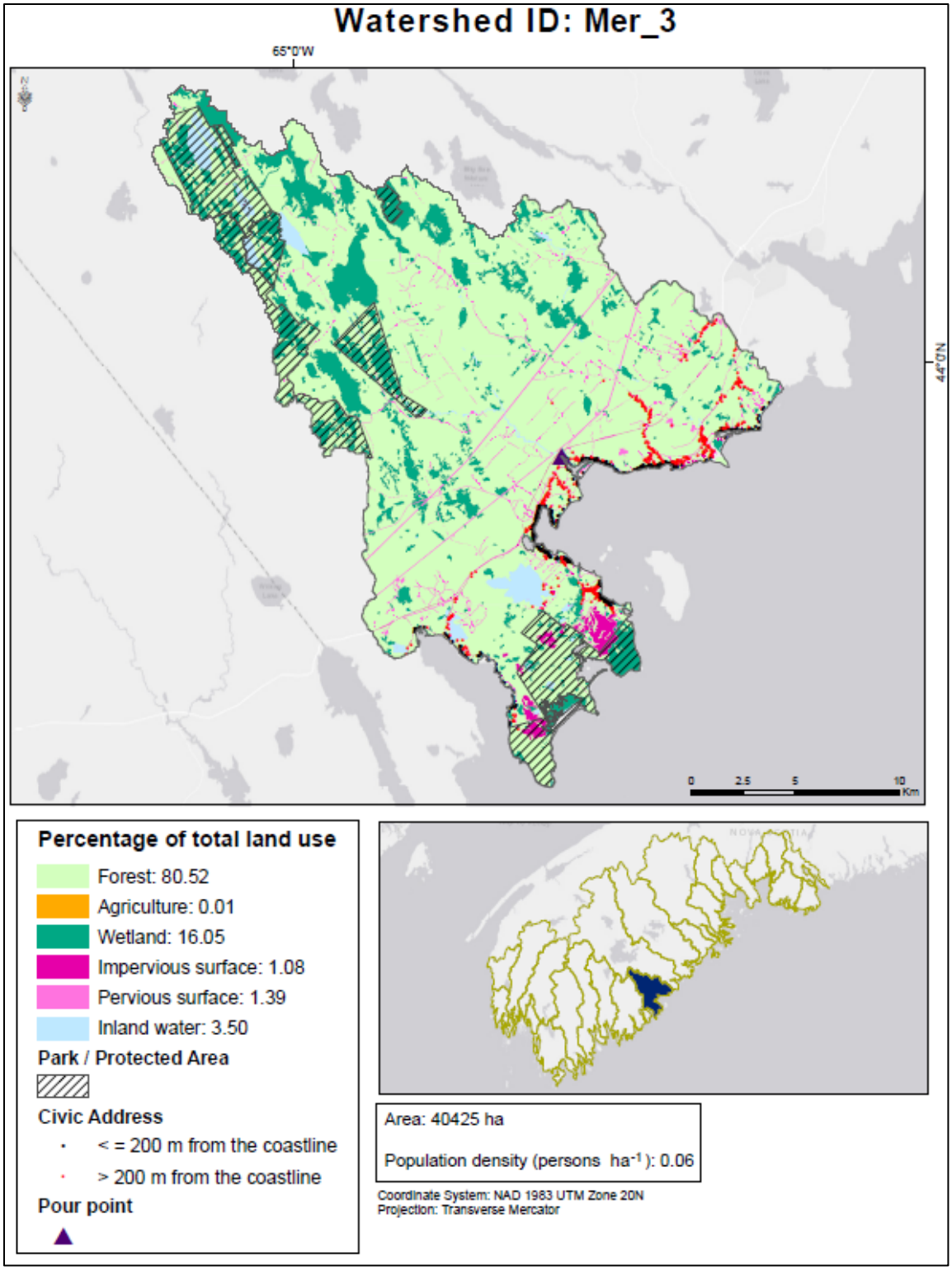


Figure 80. Land-use map for Mersey watershed Mer_3. Insets: Watershed area and population density (lower right); location of watershed in relation to the Western sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

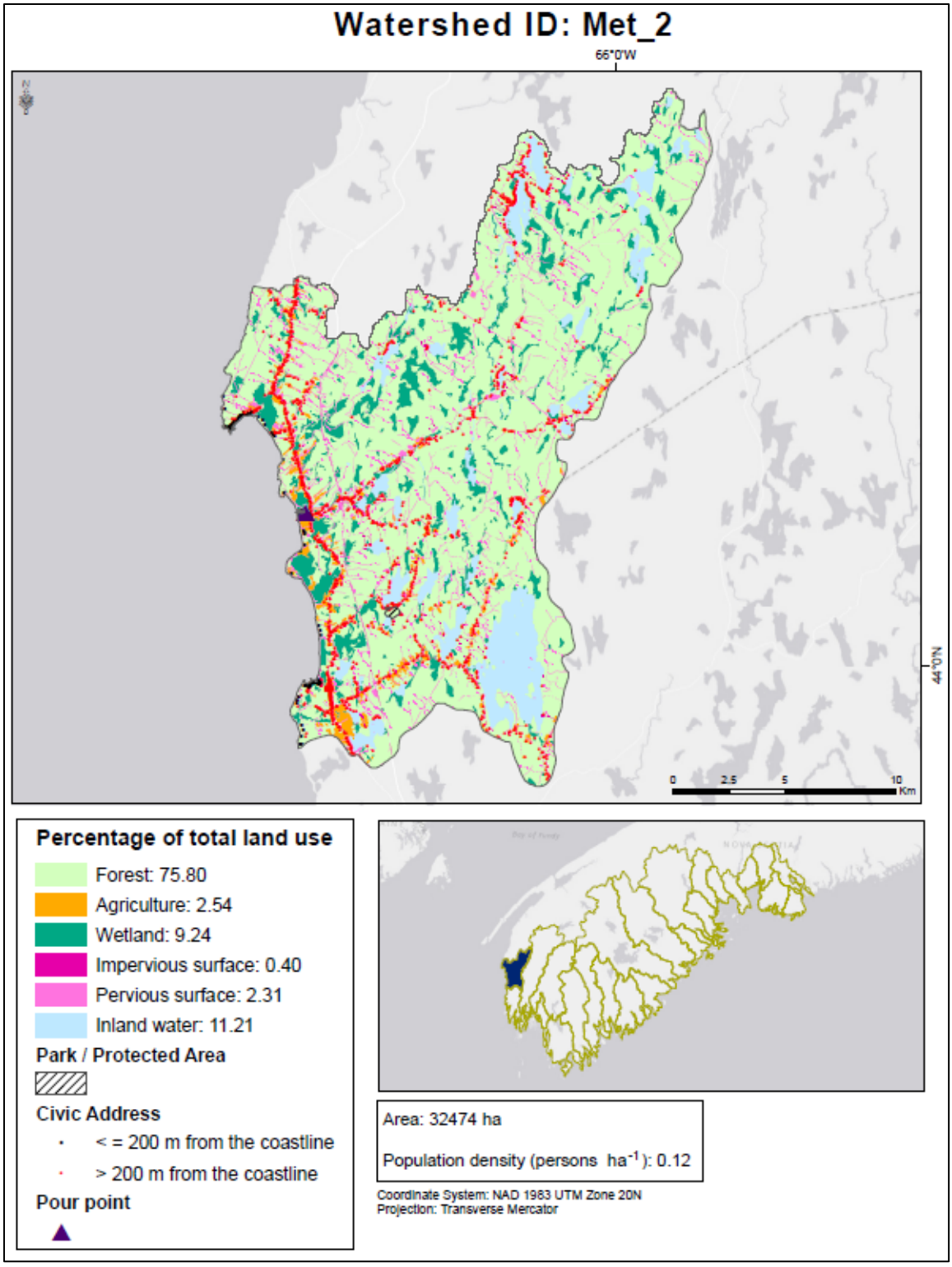


Figure 81. Land-use map for Meteghan watershed Met_1. Insets: Watershed area and population density (lower right); location of watershed in relation to the Western sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

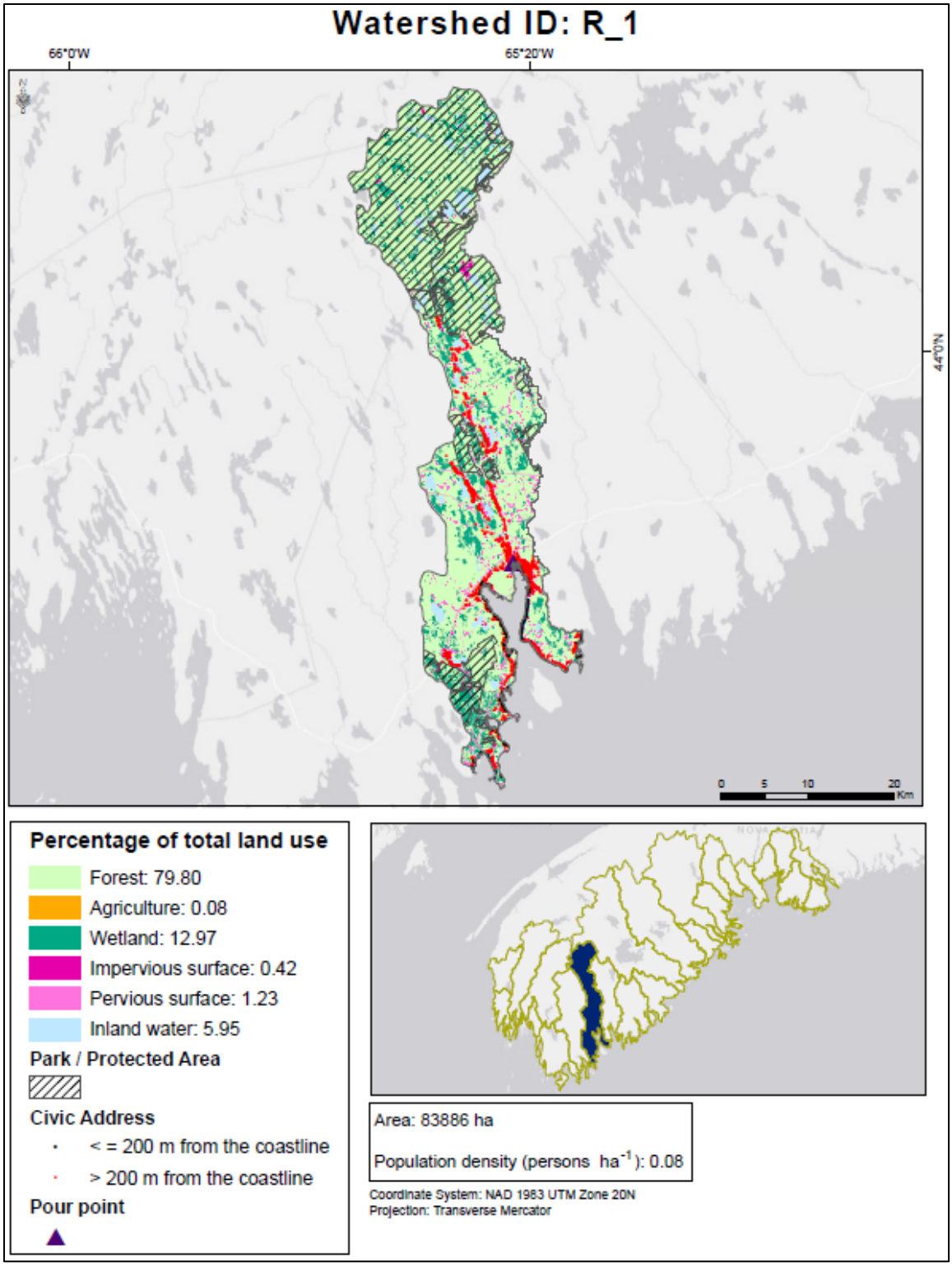


Figure 82. Land-use map for Roseway watershed R_1. Insets: Watershed area and population density (lower right); location of watershed in relation to the Western sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

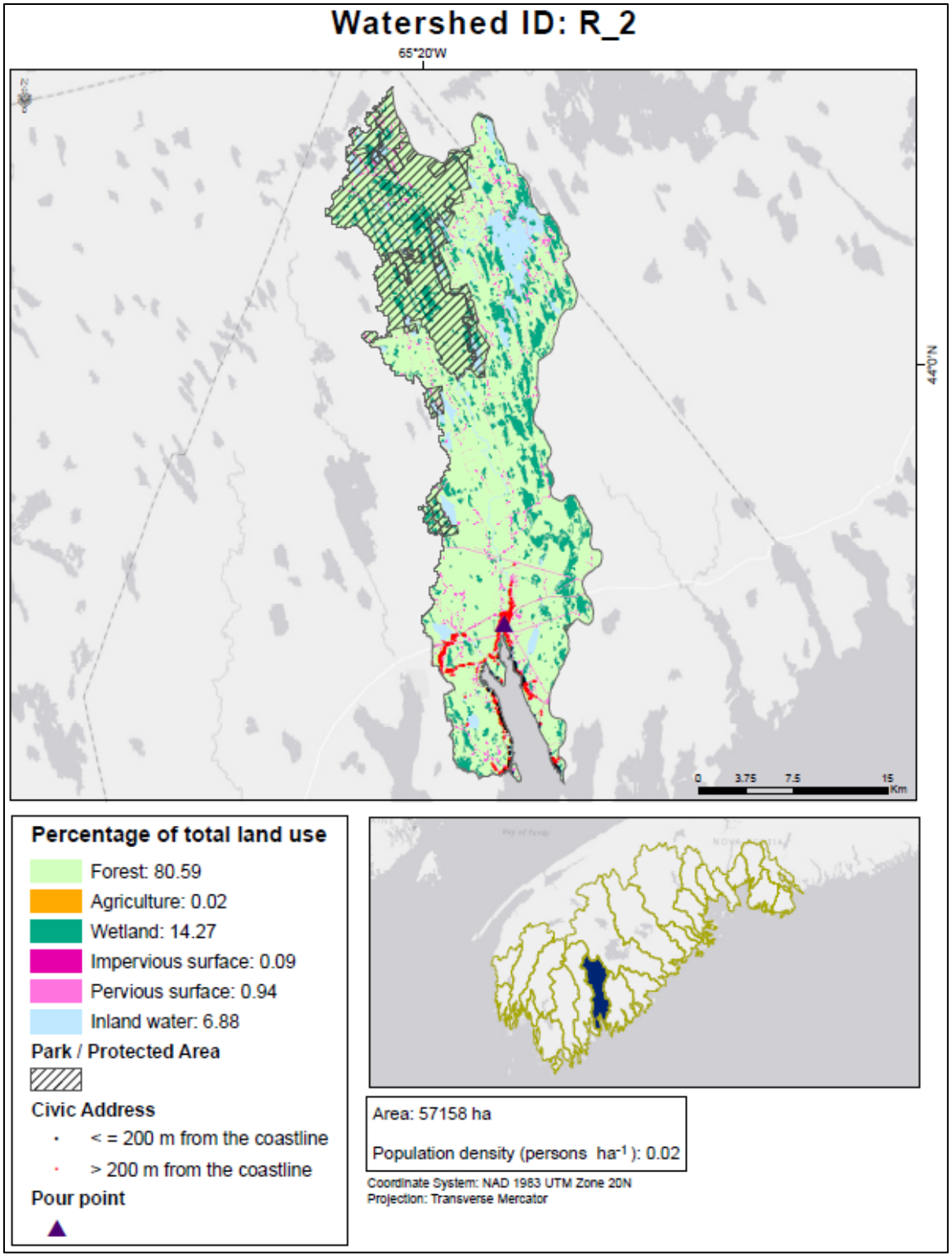


Figure 83. Land-use map for Roseway watershed R_2. Insets: Watershed area and population density (lower right); location of watershed in relation to the Western sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

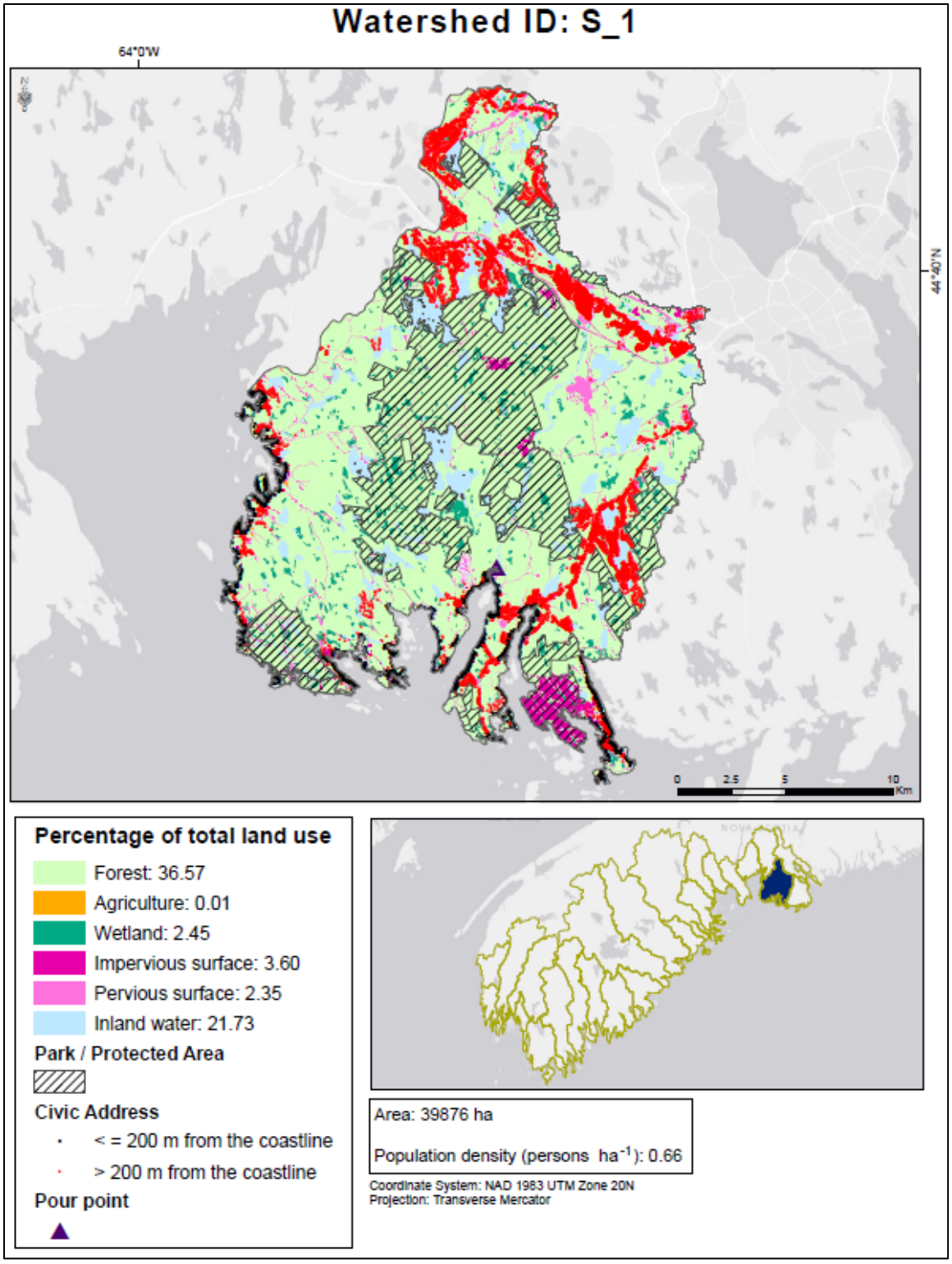


Figure 84. Land-use map for Sackville watershed S_1. Insets: Watershed area and population density (lower right); location of watershed in relation to the Western sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

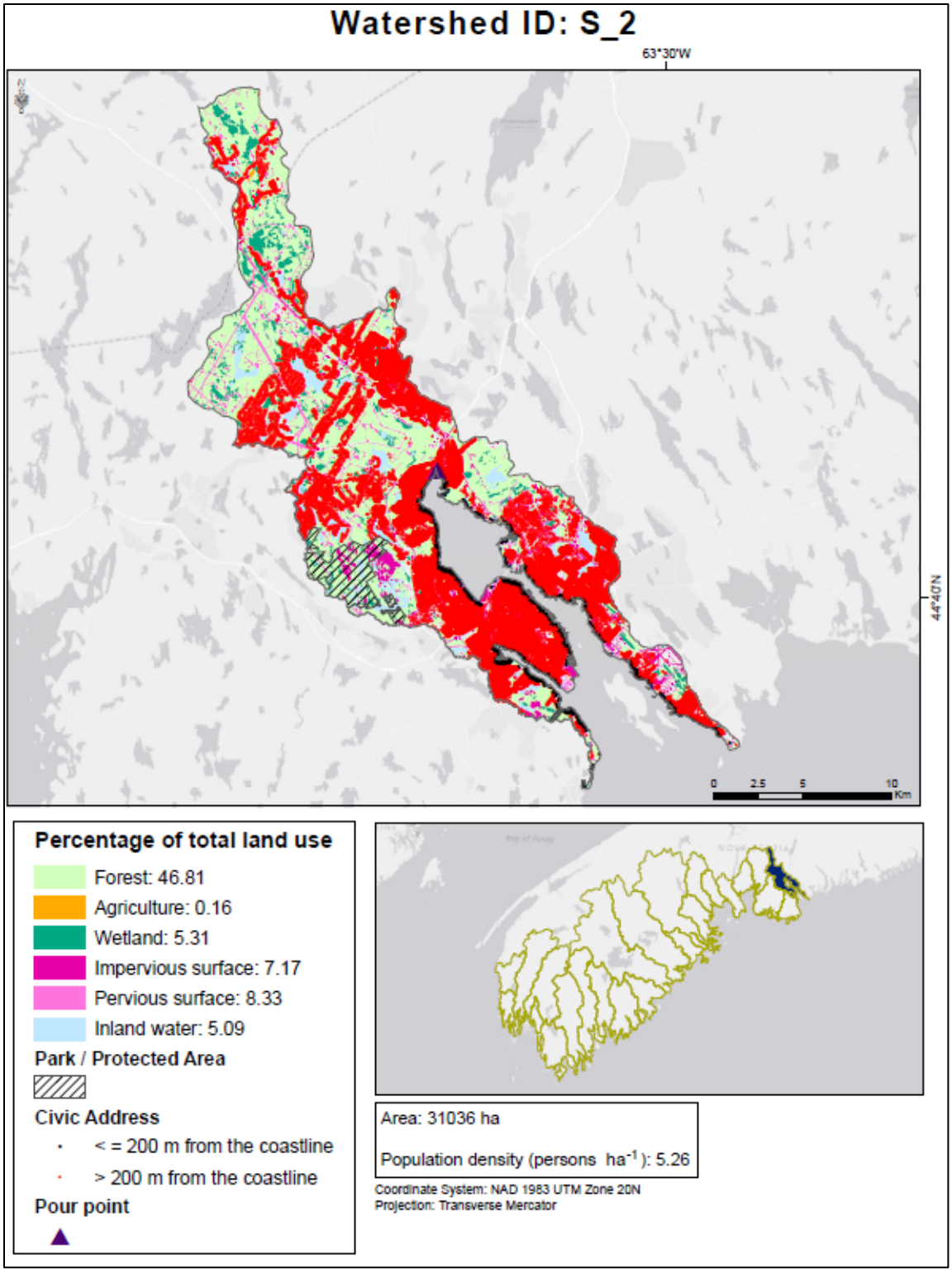


Figure 85. Land-use map for Sackville watershed S_2. Insets: Watershed area and population density (lower right); location of watershed in relation to the Western sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

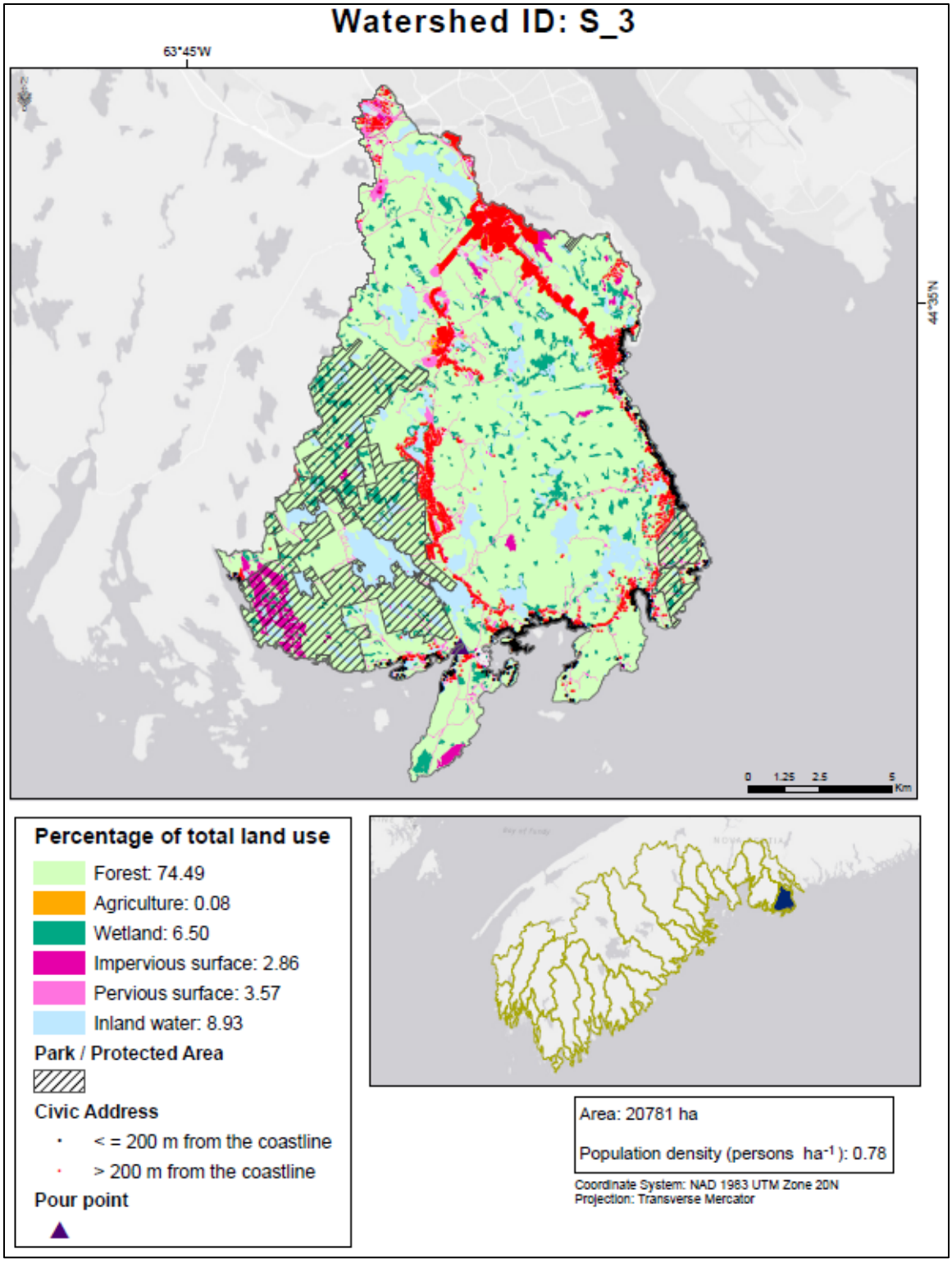


Figure 86. Land-use map for Sackville watershed S_3. Insets: Watershed area and population density (lower right); location of watershed in relation to the Western sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

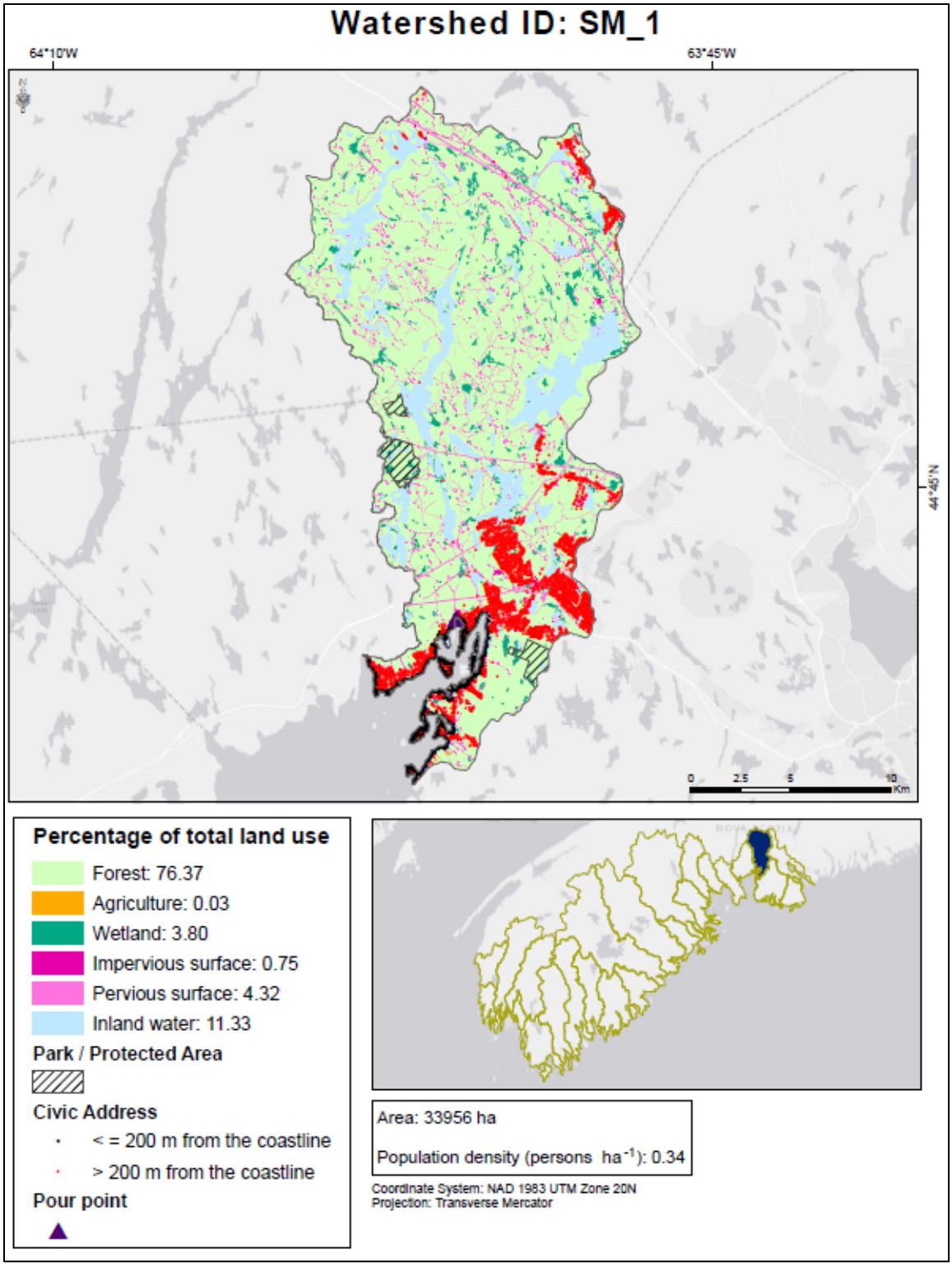


Figure 87. Land-use map for St. Margarets Bay watershed SM_1. Insets: Watershed area and population density (lower right); location of watershed in relation to the Western sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

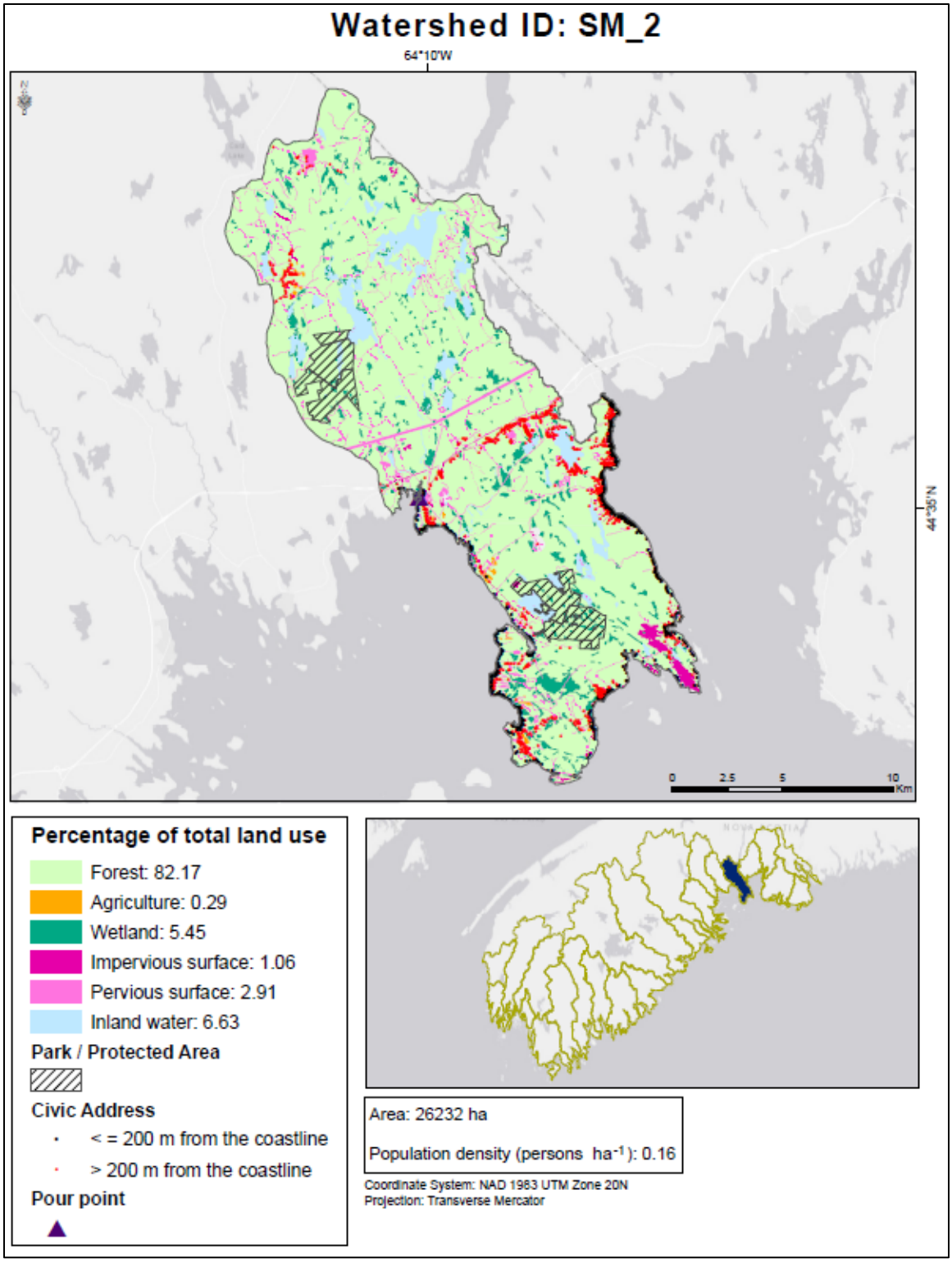


Figure 88. Land-use map for St. Margarets Bay watershed SM_2. Insets: Watershed area and population density (lower right); location of watershed in relation to the Western sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

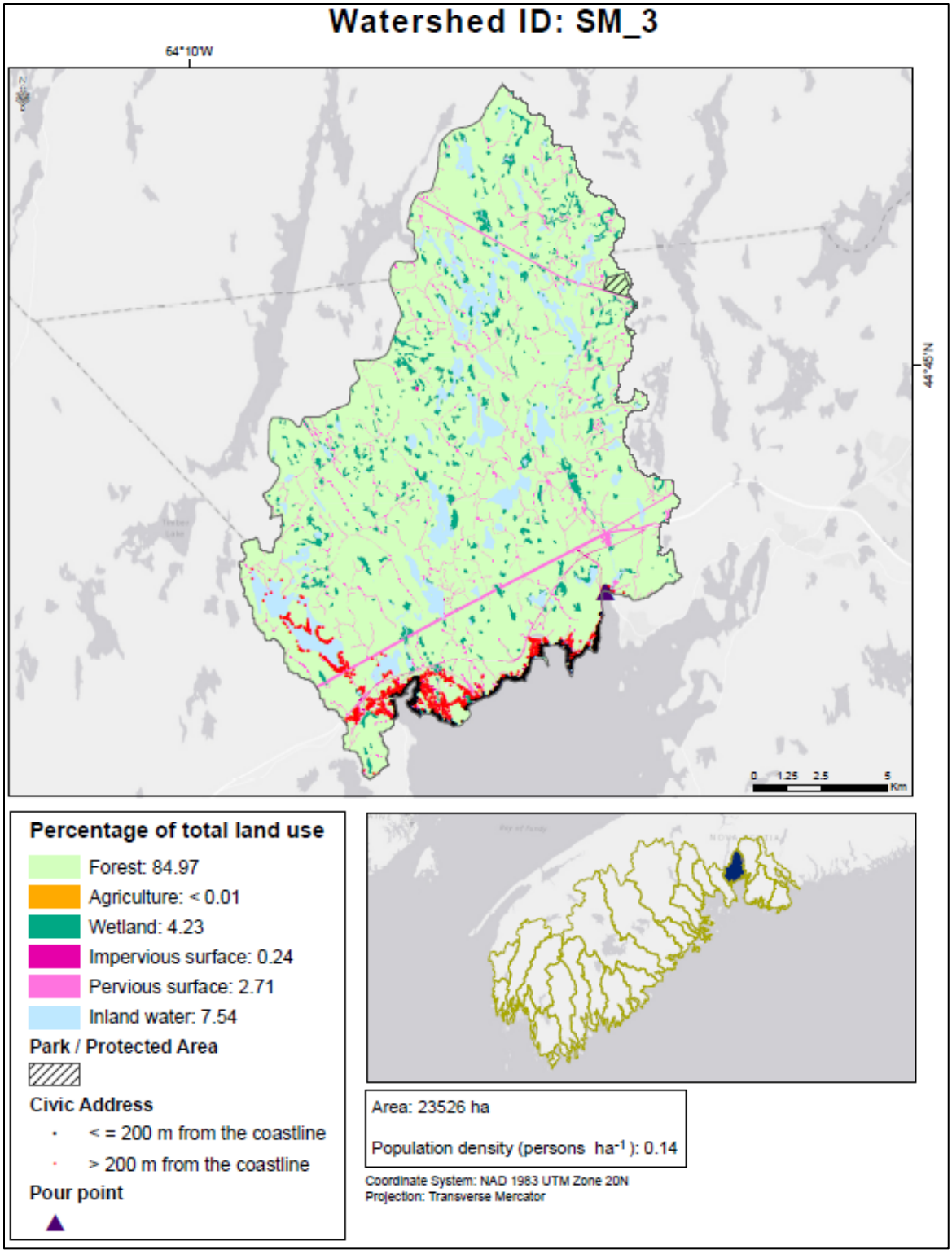


Figure 89. Land-use map for St. Margarets Bay watershed SM_3. Insets: Watershed area and population density (lower right); location of watershed in relation to the Western sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

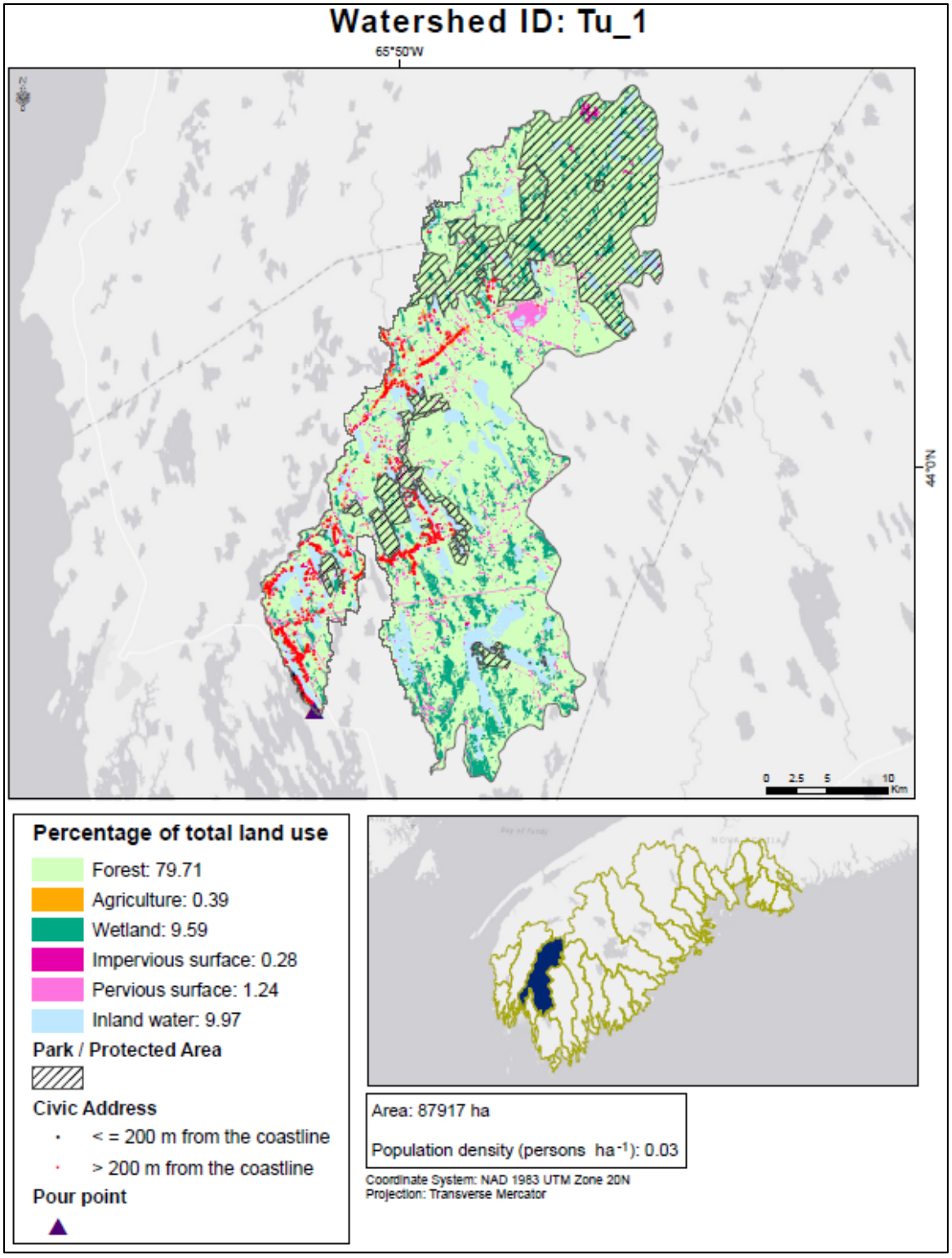


Figure 90. Land-use map for Tusket watershed Tu_1. Insets: Watershed area and population density (lower right); location of watershed in relation to the Western sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

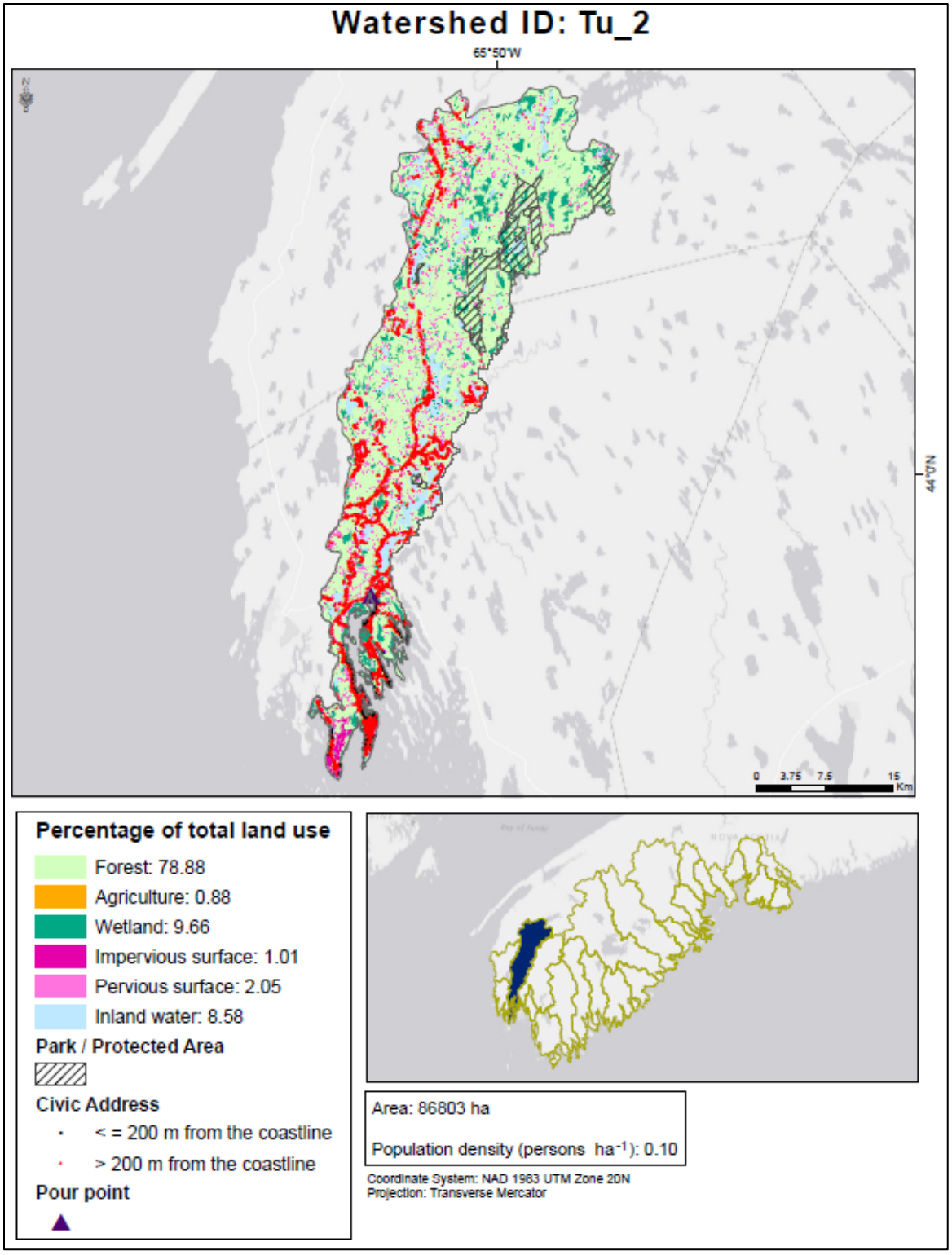


Figure 91. Land-use map for Tusket watershed Tu_2. Insets: Watershed area and population density (lower right); location of watershed in relation to the Western sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

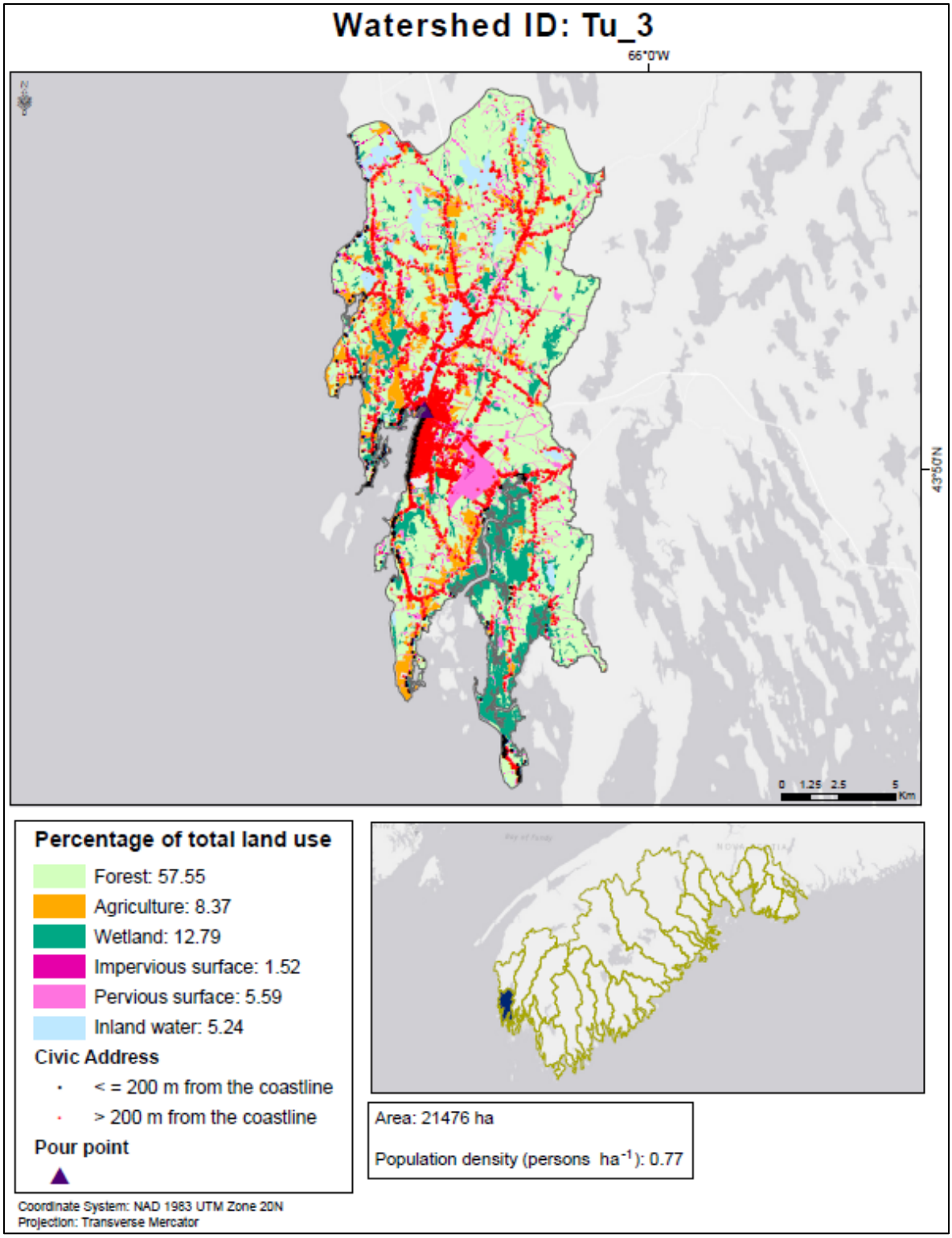


Figure 92. Land-use map for Tusket watershed Tu_3. Insets: Watershed area and population density (lower right); location of watershed in relation to the Western sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

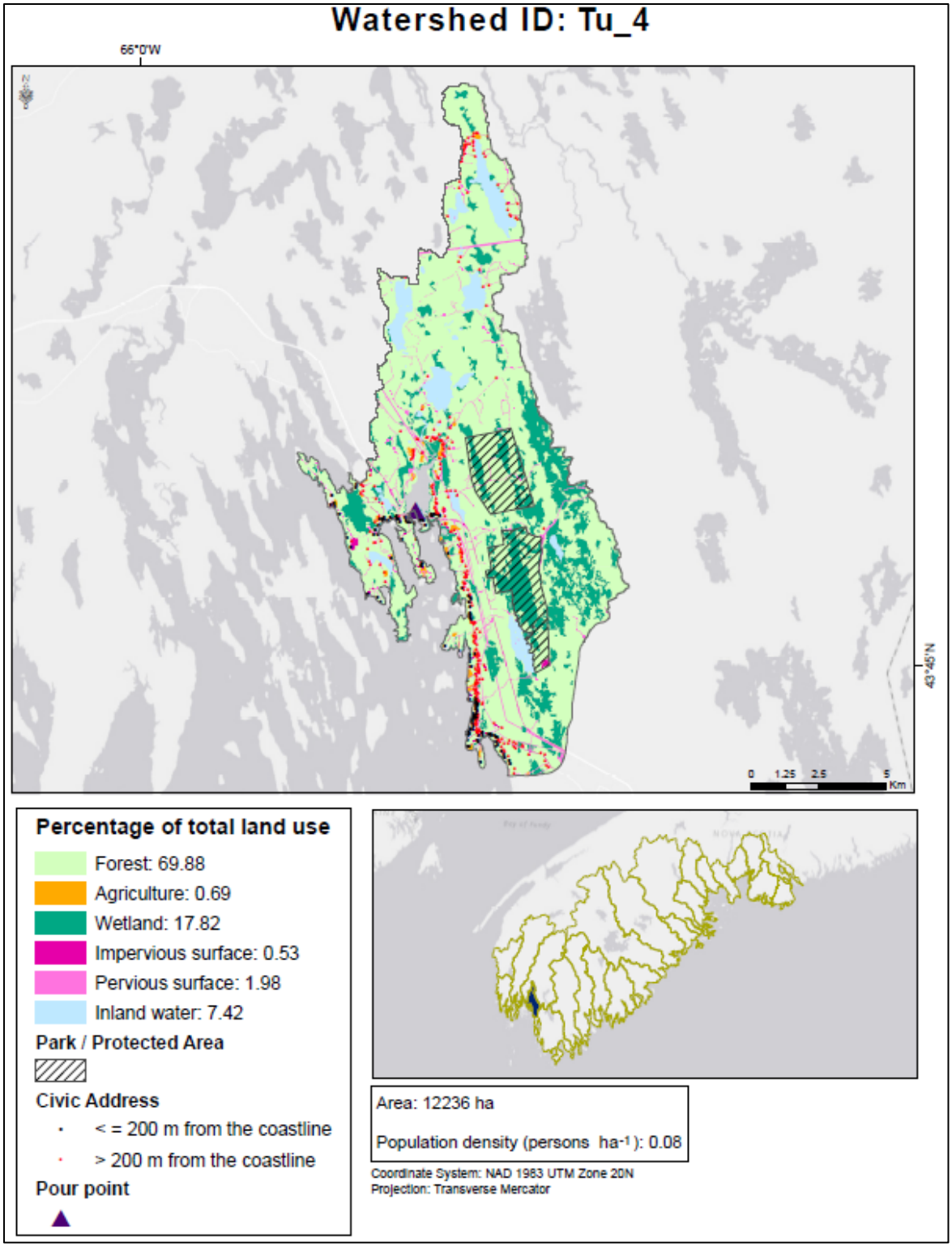


Figure 93. Land-use map for Tusket watershed Tu_4. Insets: Watershed area and population density (lower right); location of watershed in relation to the Western sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

Cape Breton Island Watershed Sub-region

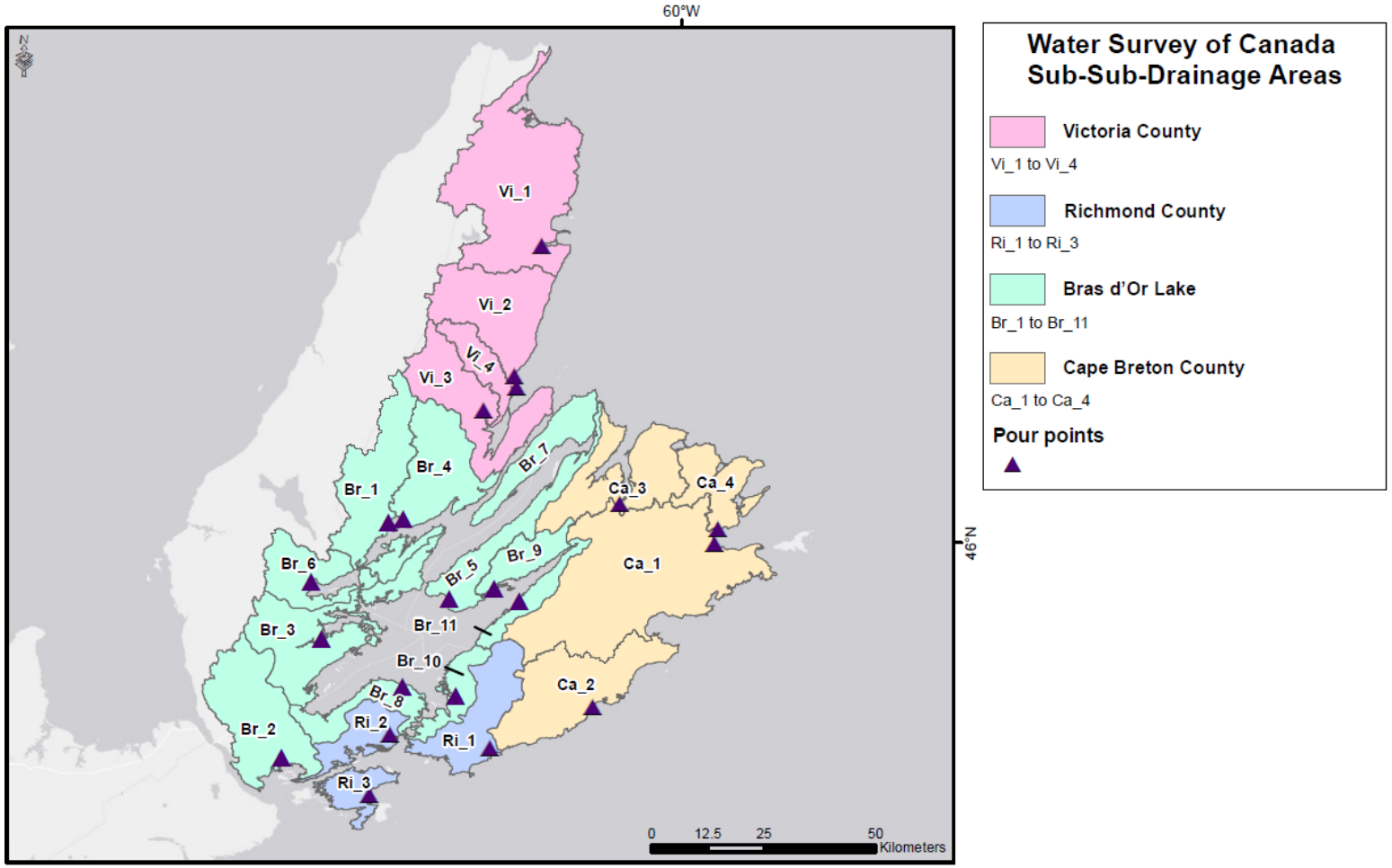


Figure 94. Cape Breton sub-region, displaying four Water Survey of Canada sub-sub-drainage areas (denoted by differing colours) and their associated watersheds. Black triangles represent the major pour points (largest outlets into the coastal zone).

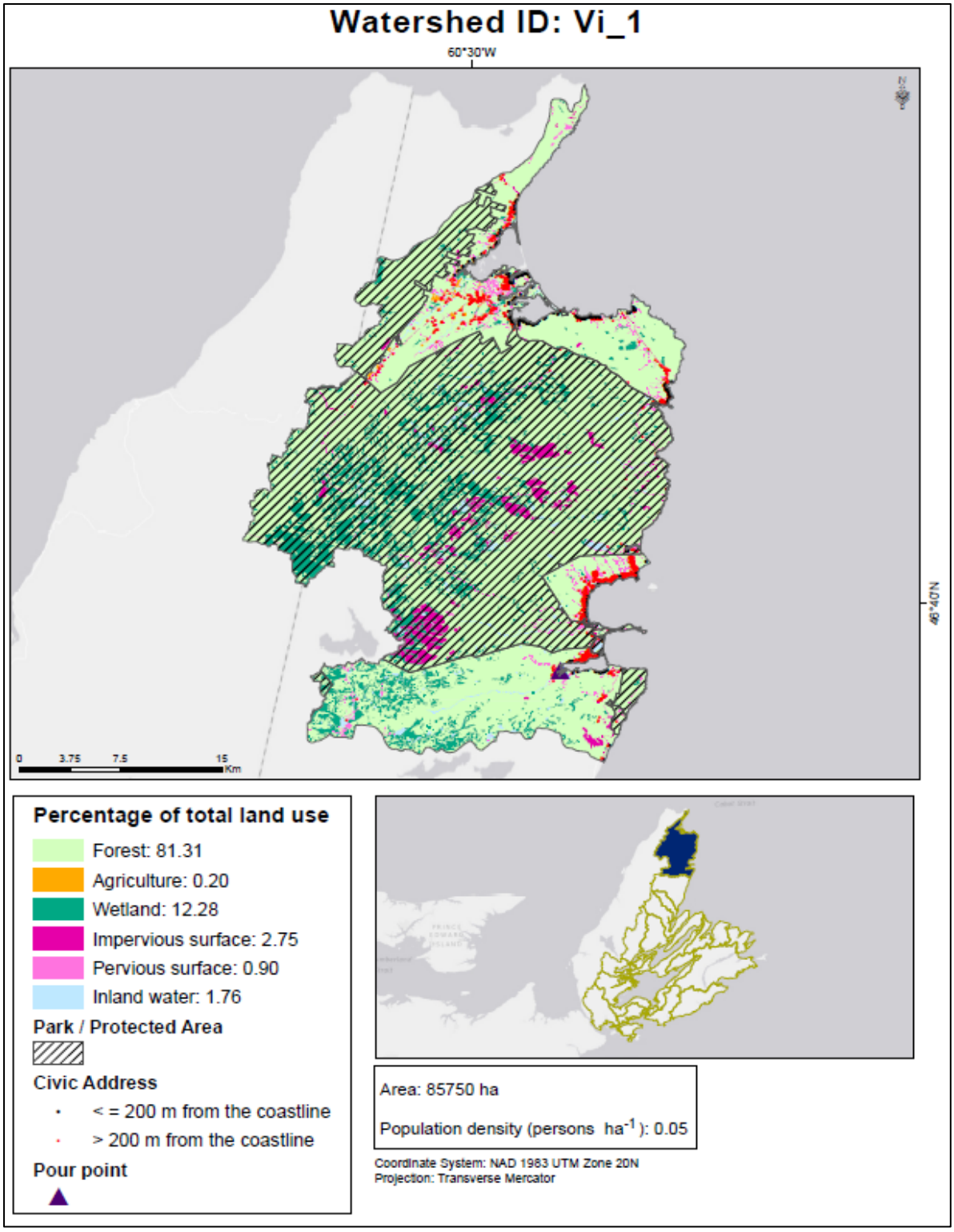


Figure 95. Land-use map for Victoria County watershed Vi_1. Insets: Watershed area and population density (lower right); location of watershed in relation to the Cape Breton Island sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

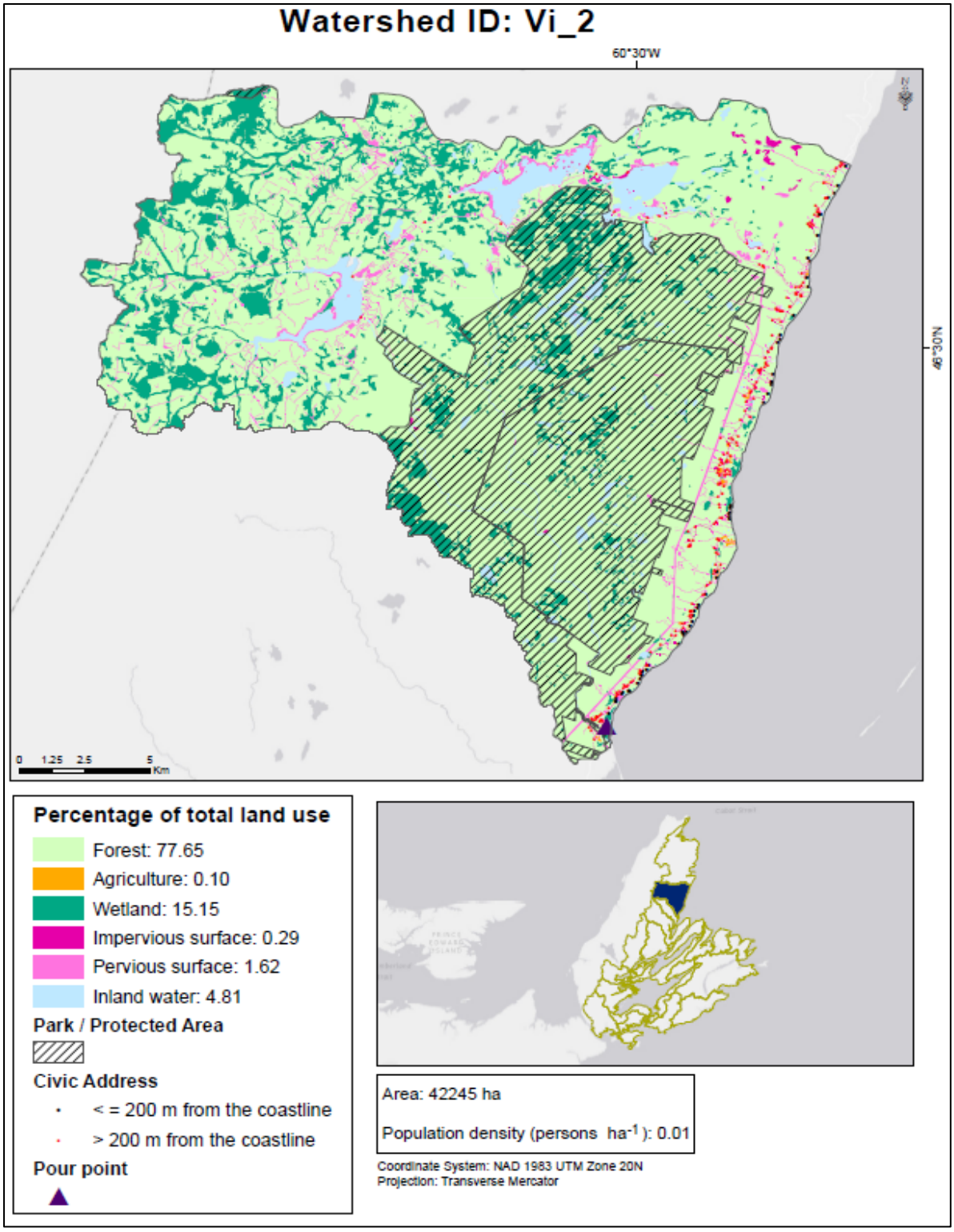


Figure 96. Land-use map for Victoria County watershed Vi_2. Insets: Watershed area and population density (lower right); location of watershed in relation to the Cape Breton Island sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

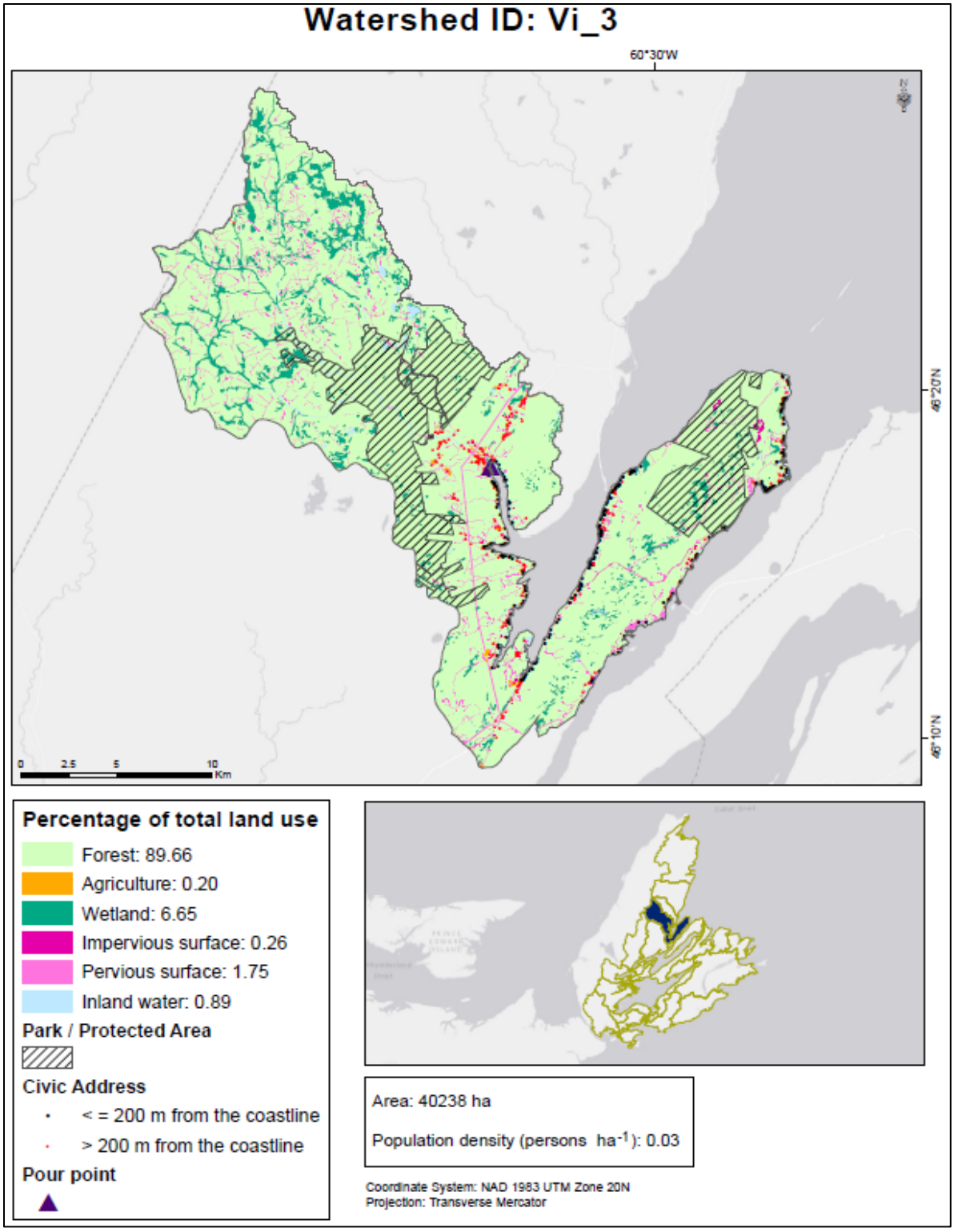


Figure 97. Land-use map for Victoria County watershed Vi_3. Insets: Watershed area and population density (lower right); location of watershed in relation to the Cape Breton Island sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

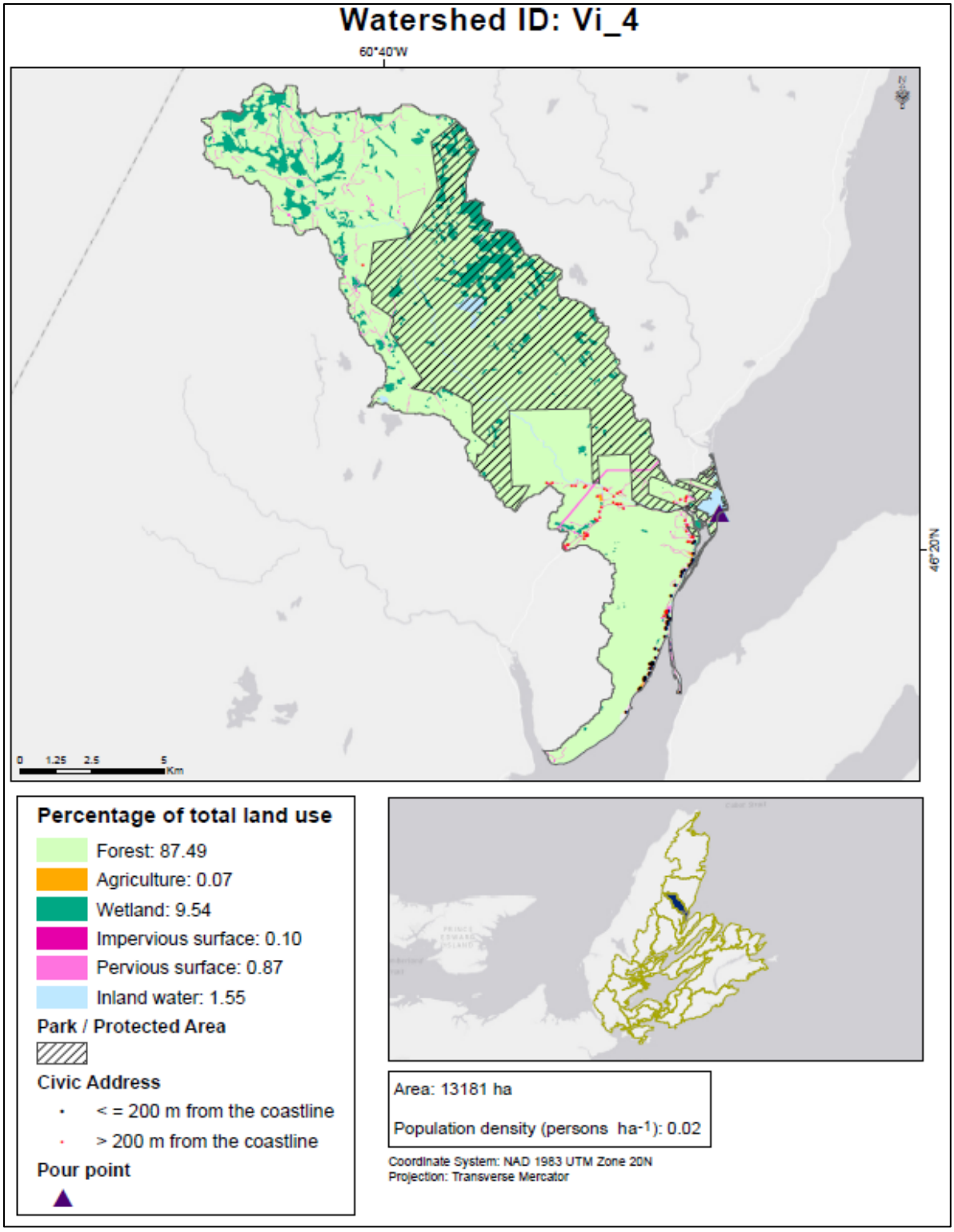


Figure 98. Land-use map for Victoria County watershed Vi_4. Insets: Watershed area and population density (lower right); location of watershed in relation to the Cape Breton Island sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

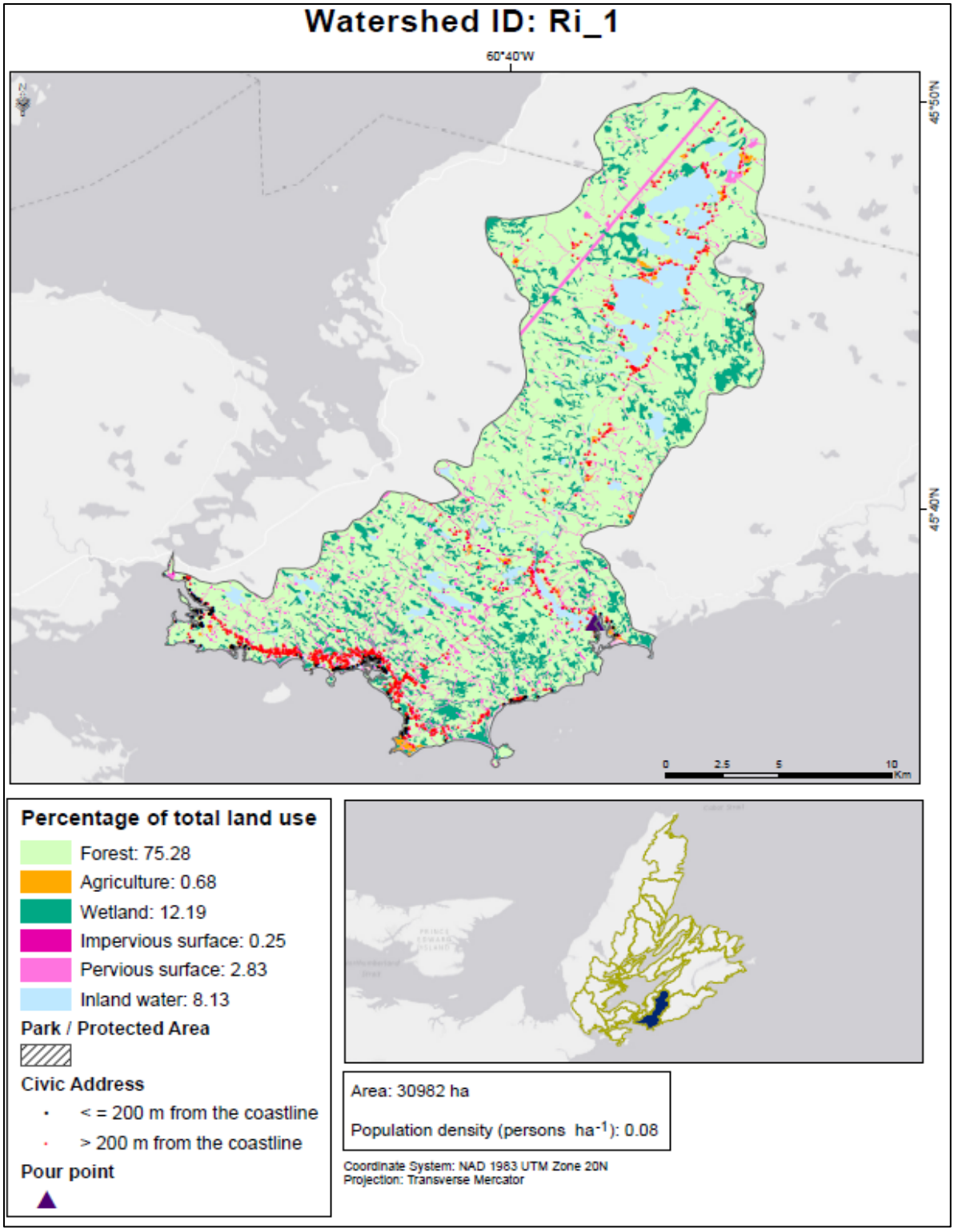


Figure 99. Land-use map for Richmond County watershed Ri_1. Insets: Watershed area and population density (lower right); location of watershed in relation to the Cape Breton Island sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

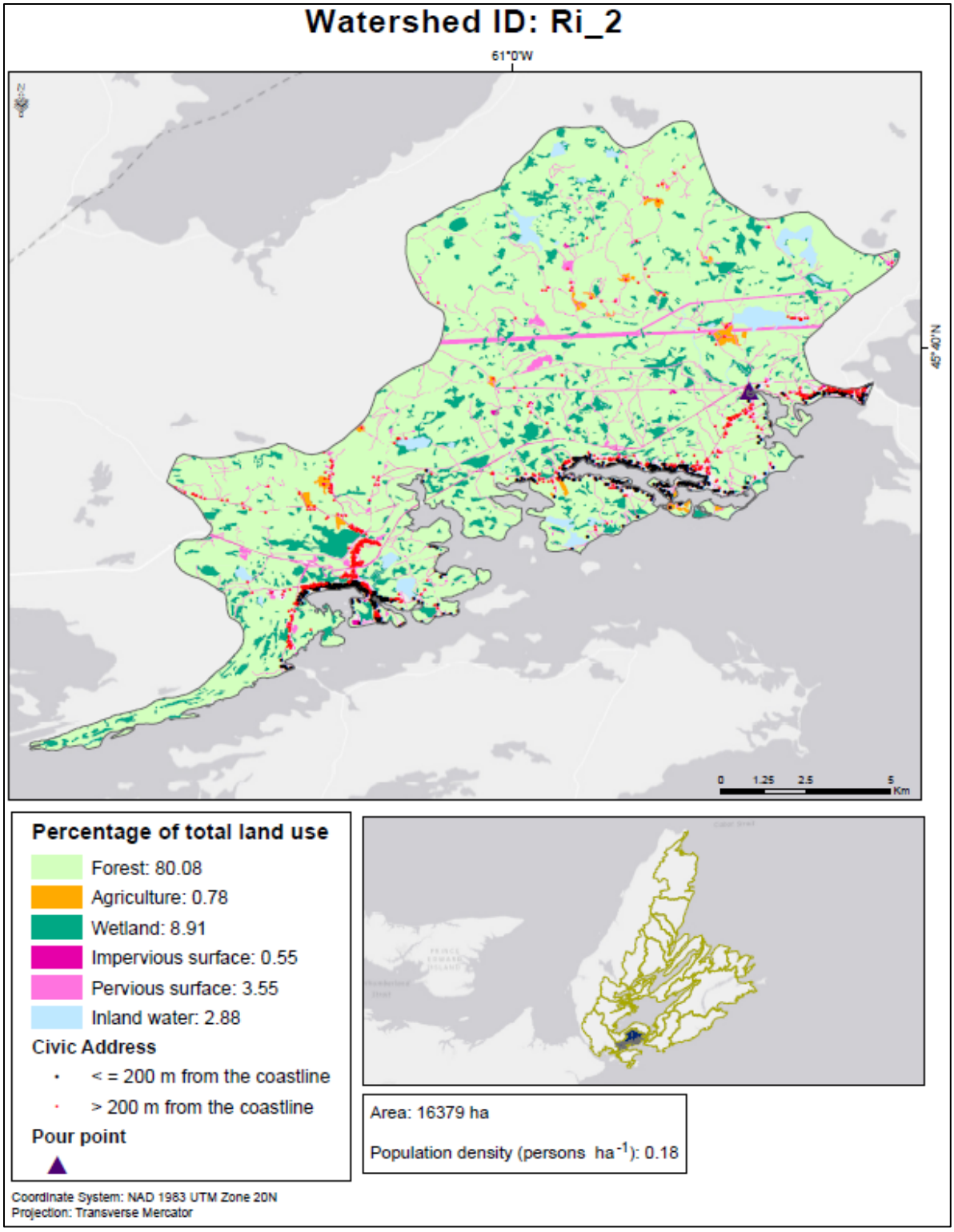


Figure 100. Land-use map for Richmond County watershed Ri_2. Insets: Watershed area and population density (lower right); location of watershed in relation to the Cape Breton Island sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

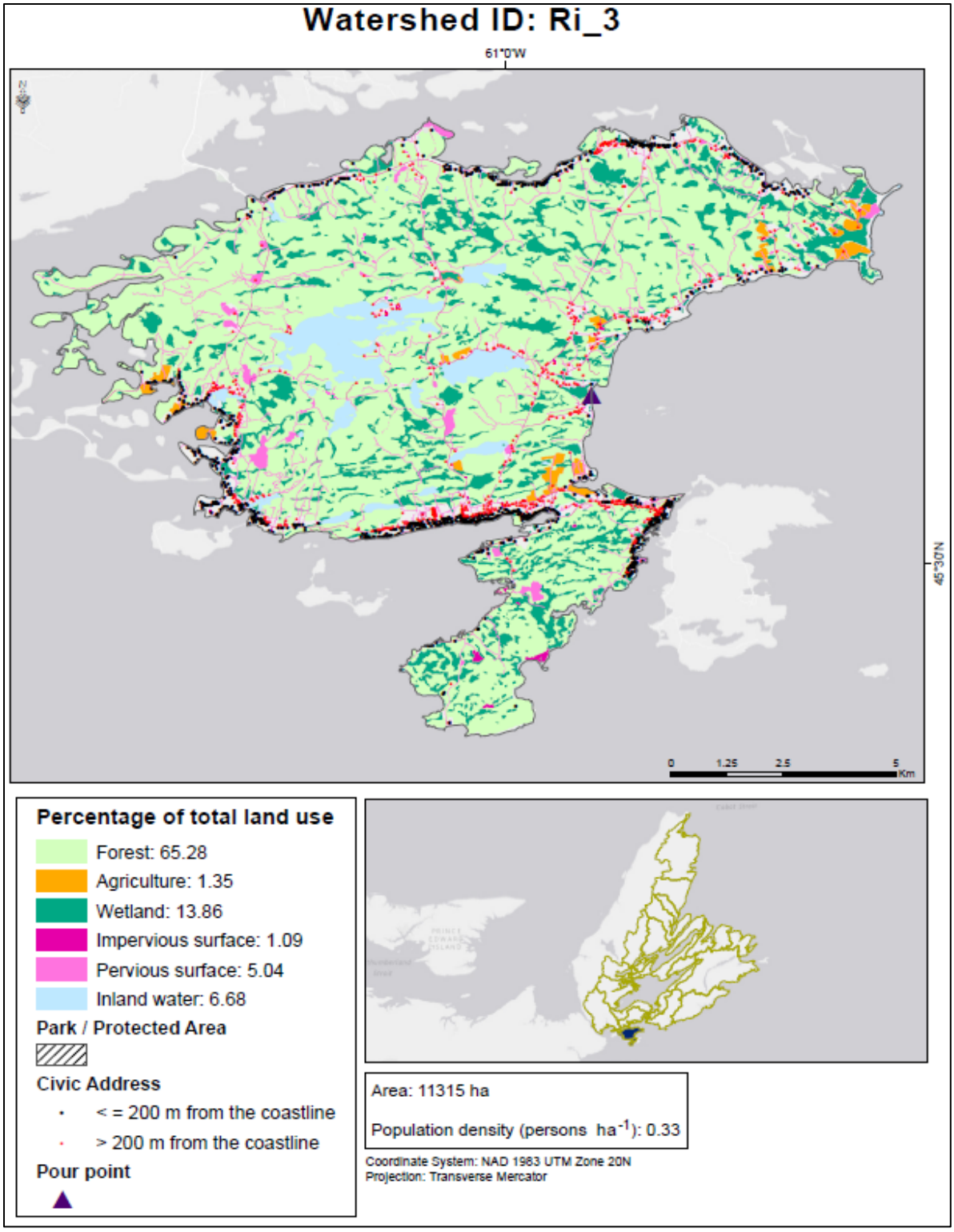


Figure 101. Land-use map for Richmond County watershed Ri_3. Insets: Watershed area and population density (lower right); location of watershed in relation to the Cape Breton Island sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

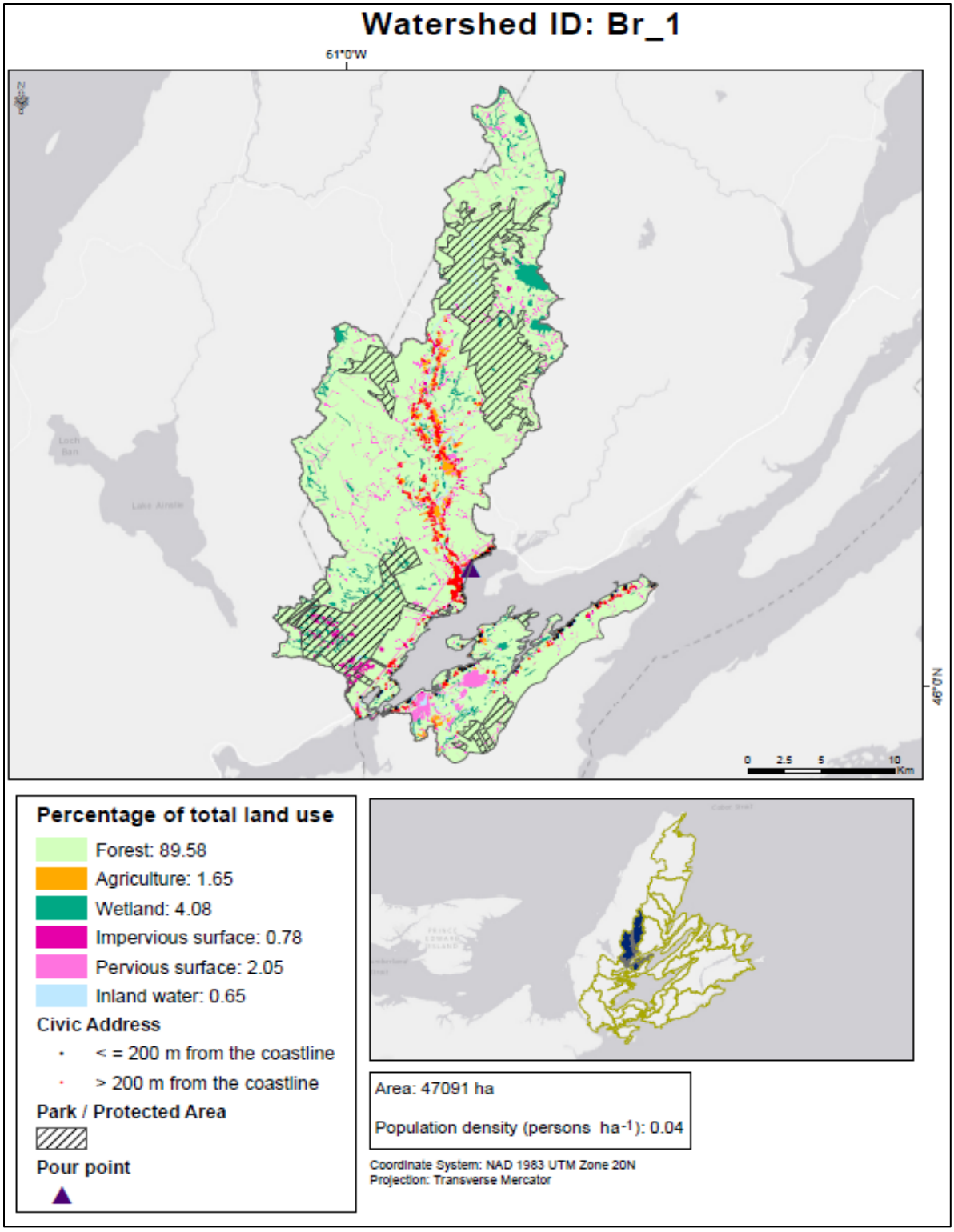


Figure 102. Land-use map for Bras d'Or Lake watershed Br_1. Insets: Watershed area and population density (lower right); location of watershed in relation to the Cape Breton Island sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

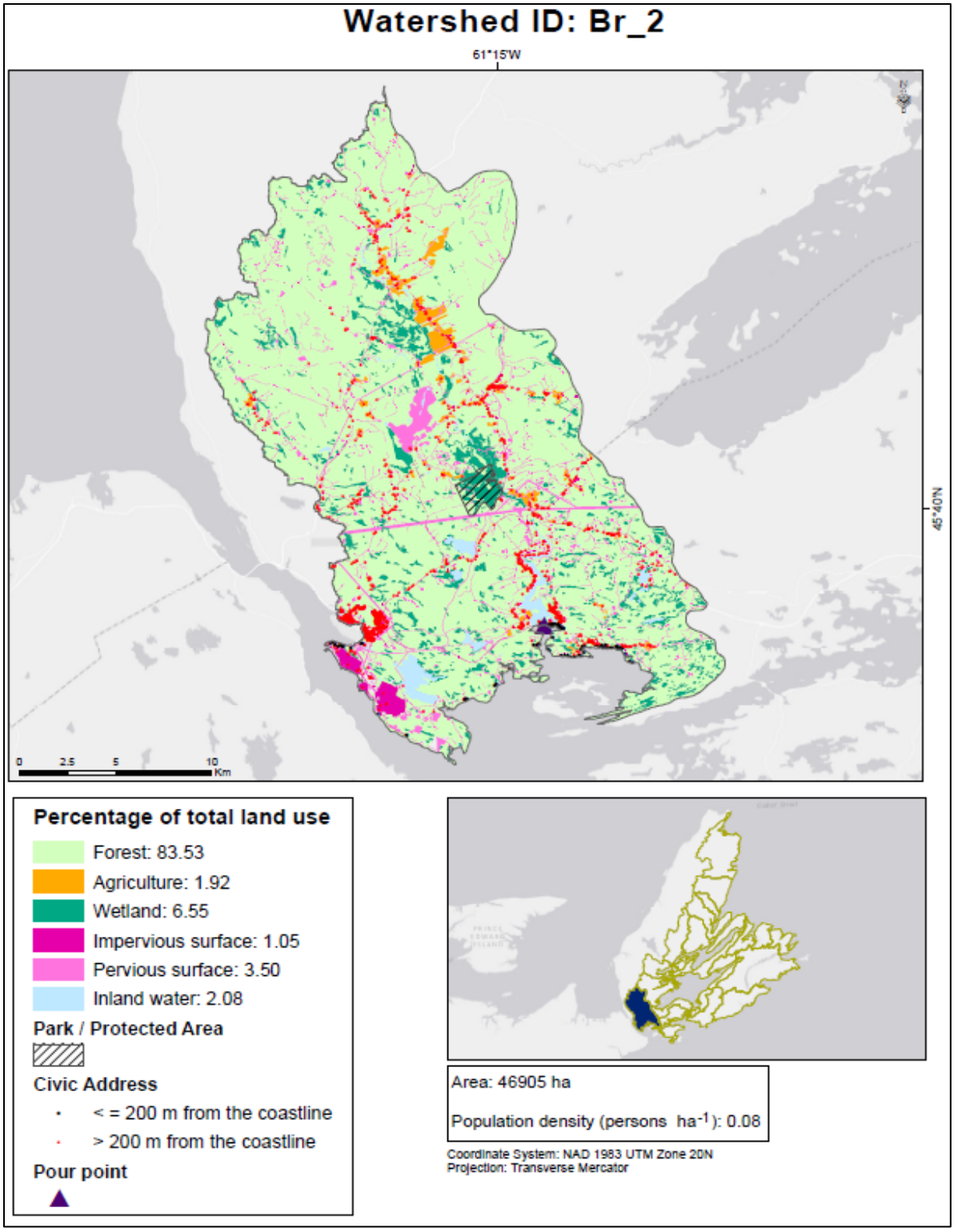


Figure 103. Land-use map for Bras d'Or Lake watershed Br_2. Insets: Watershed area and population density (lower right); location of watershed in relation to the Cape Breton Island sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

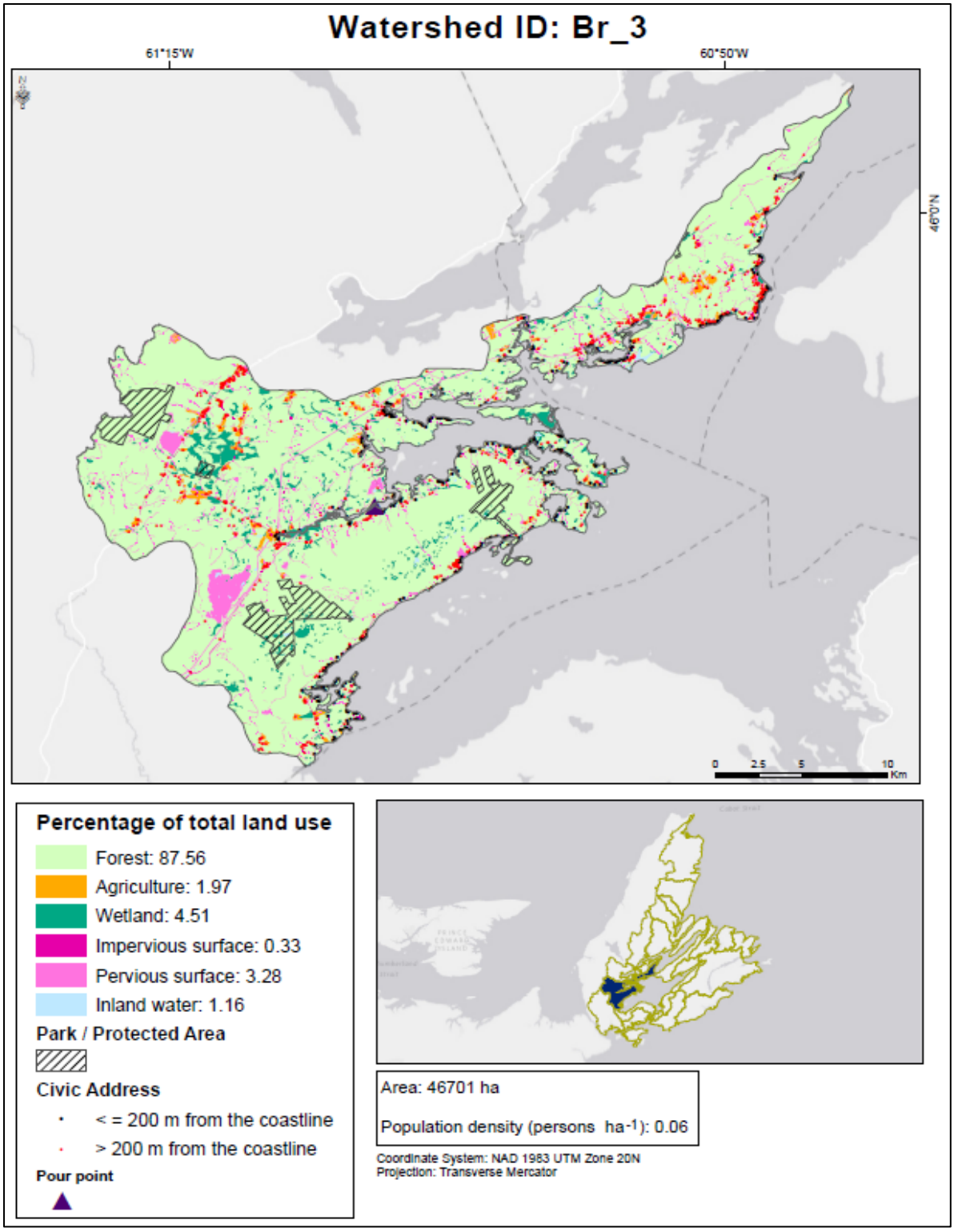


Figure 104. Land-use map for Bras d'Or Lake watershed Br_3. Insets: Watershed area and population density (lower right); location of watershed in relation to the Cape Breton Island sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

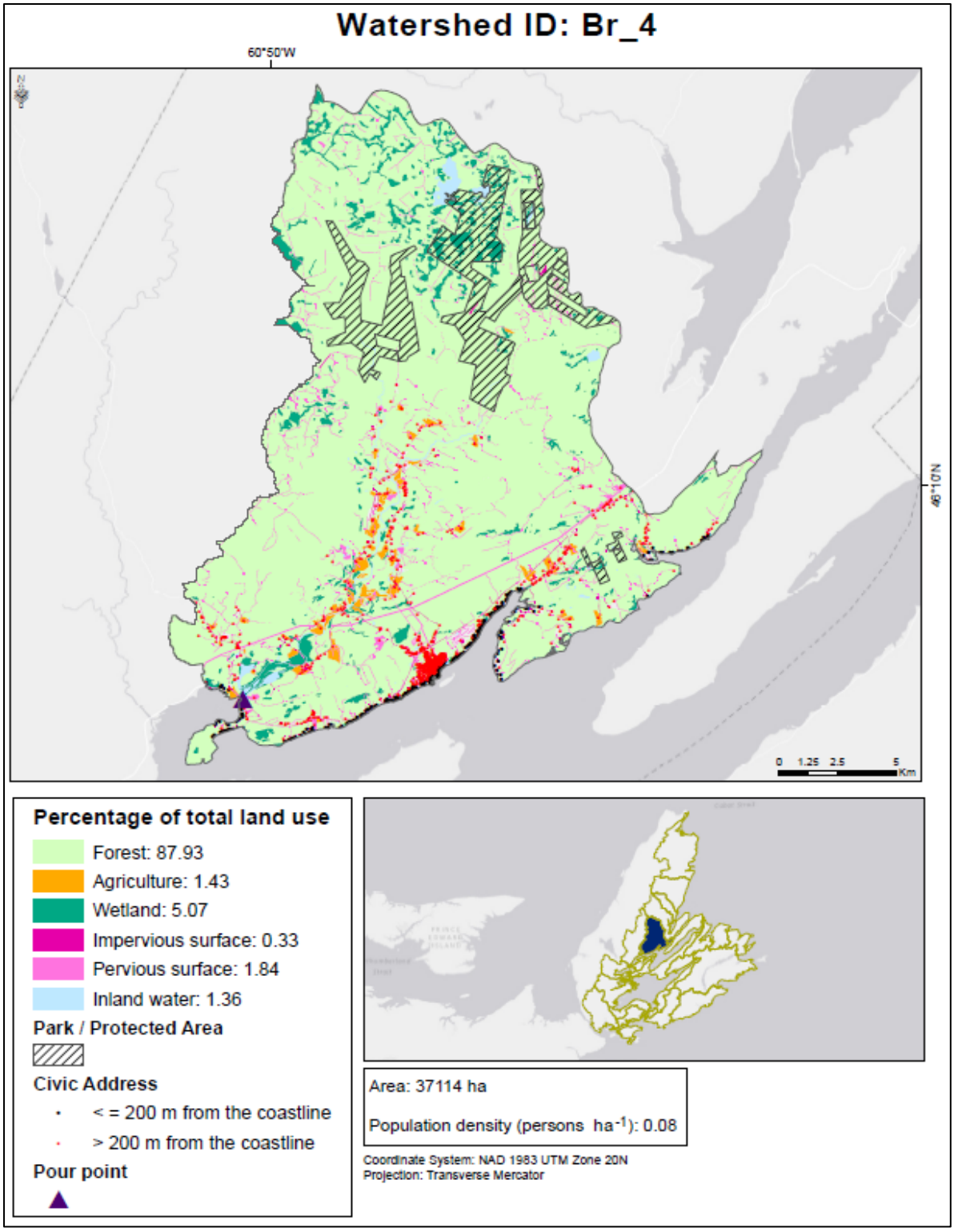


Figure 105. Land-use map for Bras d'Or Lake watershed Br_4. Insets: Watershed area and population density (lower right); location of watershed in relation to the Cape Breton Island sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

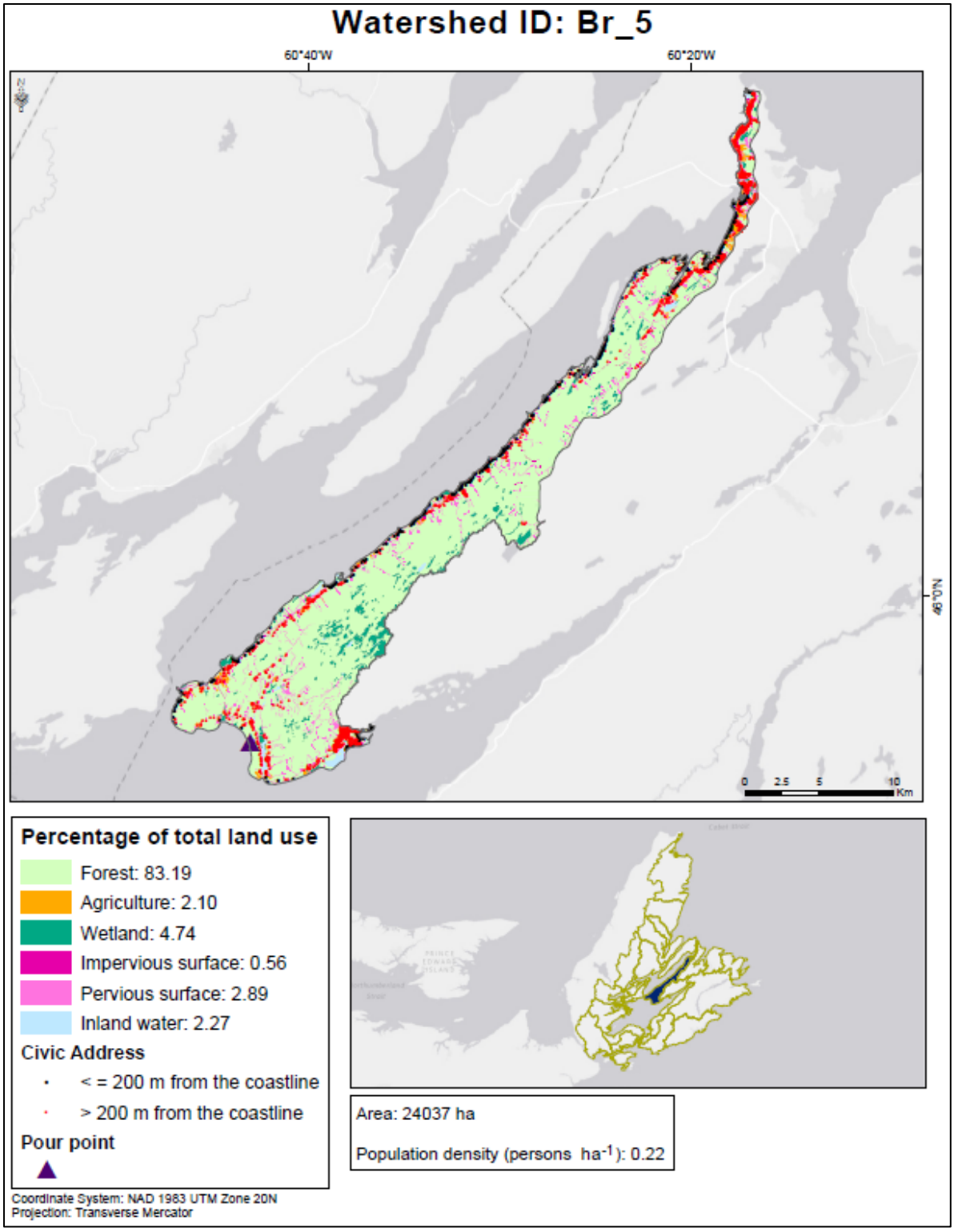


Figure 106. Land-use map for Bras d'Or Lake watershed Br_5. Insets: Watershed area and population density (lower right); location of watershed in relation to the Cape Breton Island sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

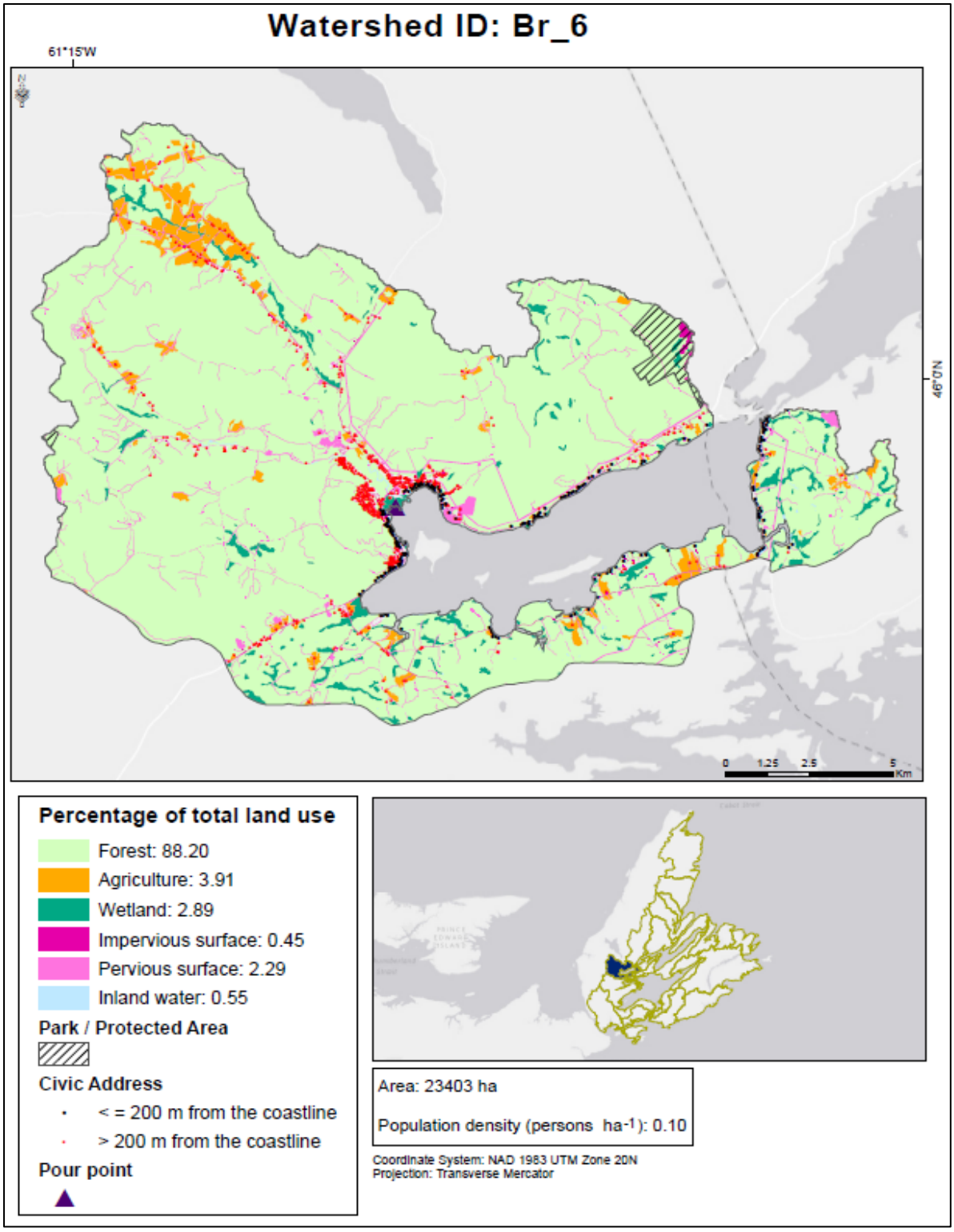


Figure 107. Land-use map for Bras d'Or Lake watershed Br_6. Insets: Watershed area and population density (lower right); location of watershed in relation to the Cape Breton Island sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

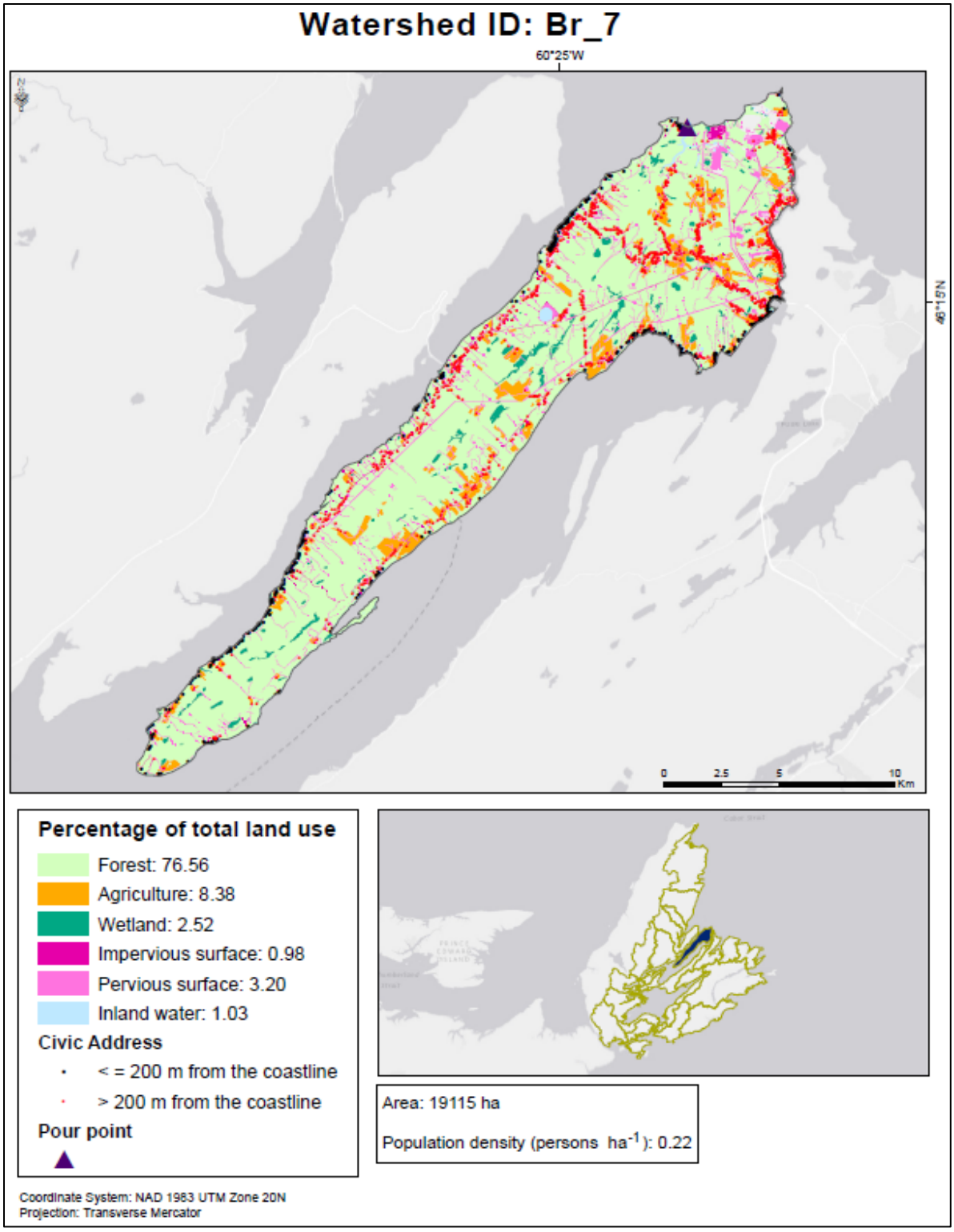


Figure 108. Land-use map for Bras d'Or Lake watershed Br_7. Insets: Watershed area and population density (lower right); location of watershed in relation to the Cape Breton Island sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

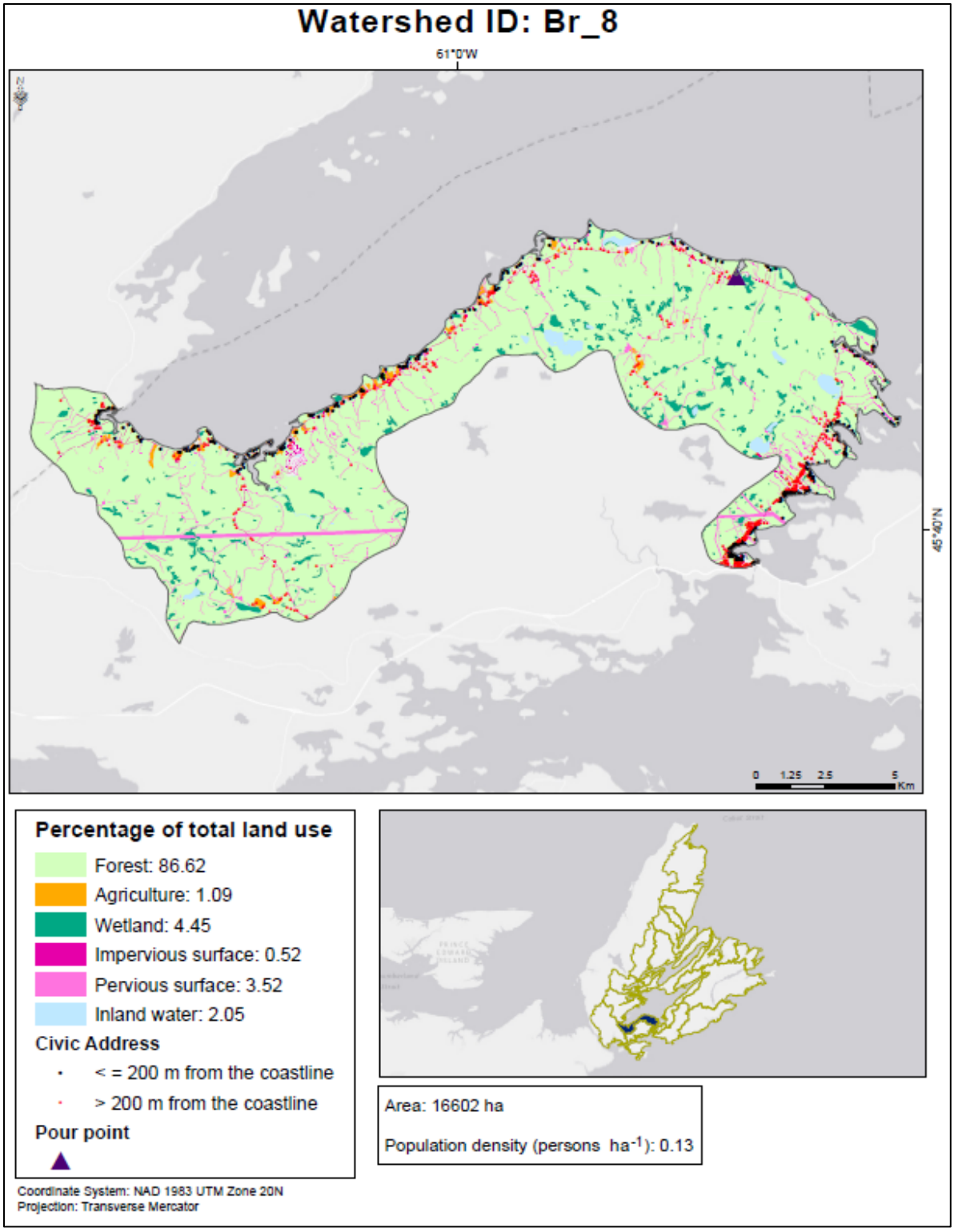


Figure 109. Land-use map for Bras d'Or Lake watershed Br_8. Insets: Watershed area and population density (lower right); location of watershed in relation to the Cape Breton Island sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

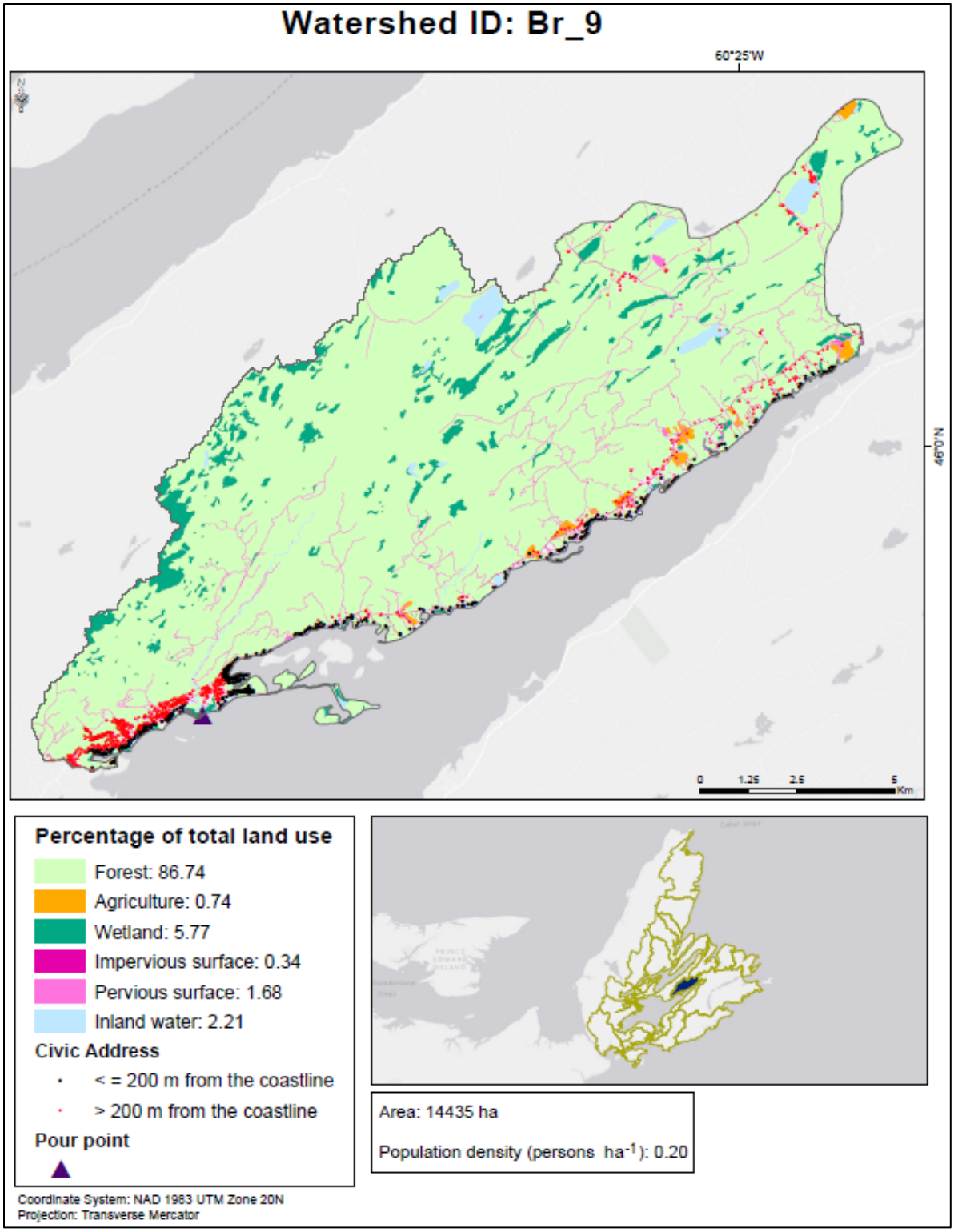


Figure 110. Land-use map for Bras d'Or Lake watershed Br_9. Insets: Watershed area and population density (lower right); location of watershed in relation to the Cape Breton Island sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

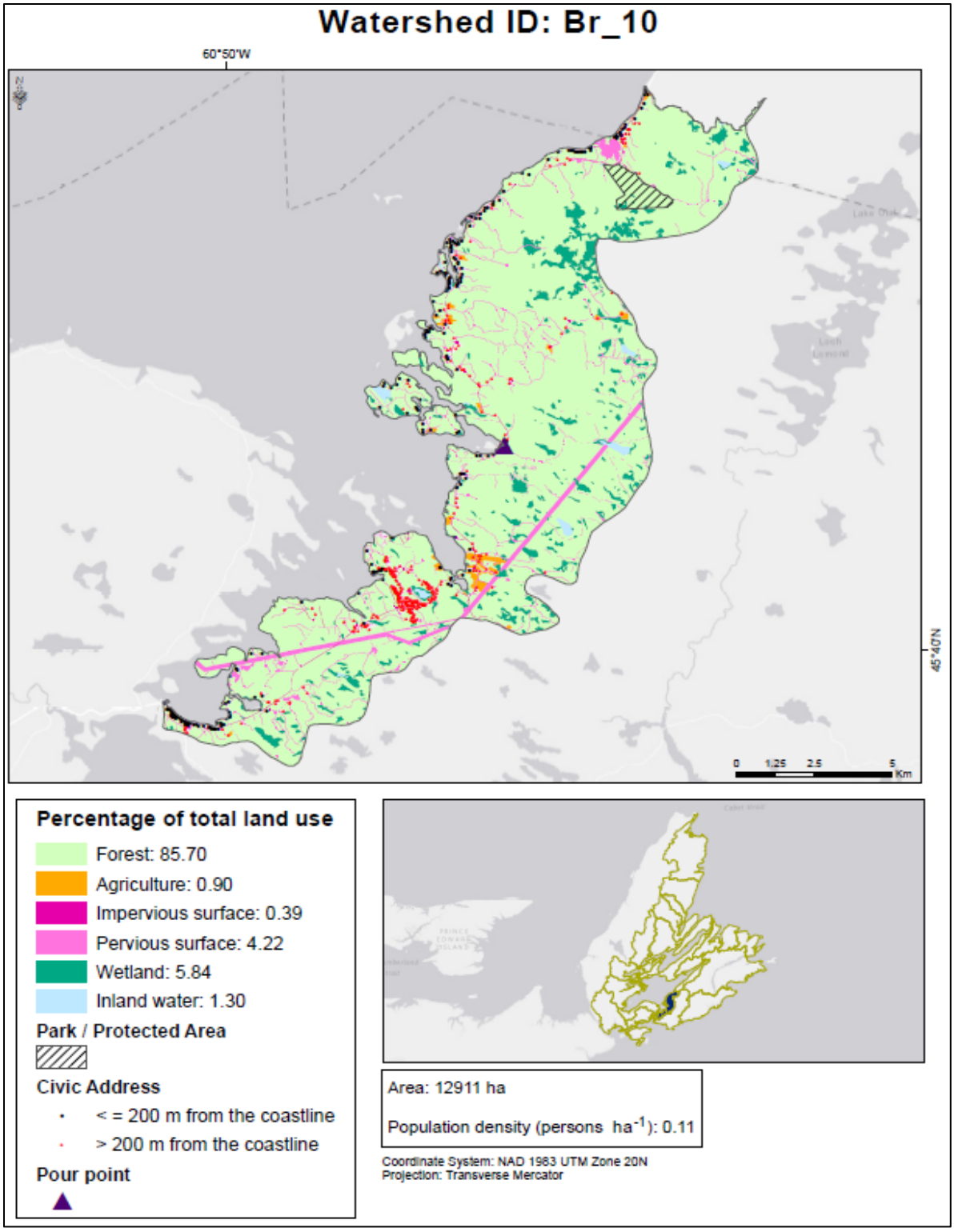


Figure 111. Land-use map for Bras d'Or Lake watershed Br_10. Insets: Watershed area and population density (lower right); location of watershed in relation to the Cape Breton Island sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

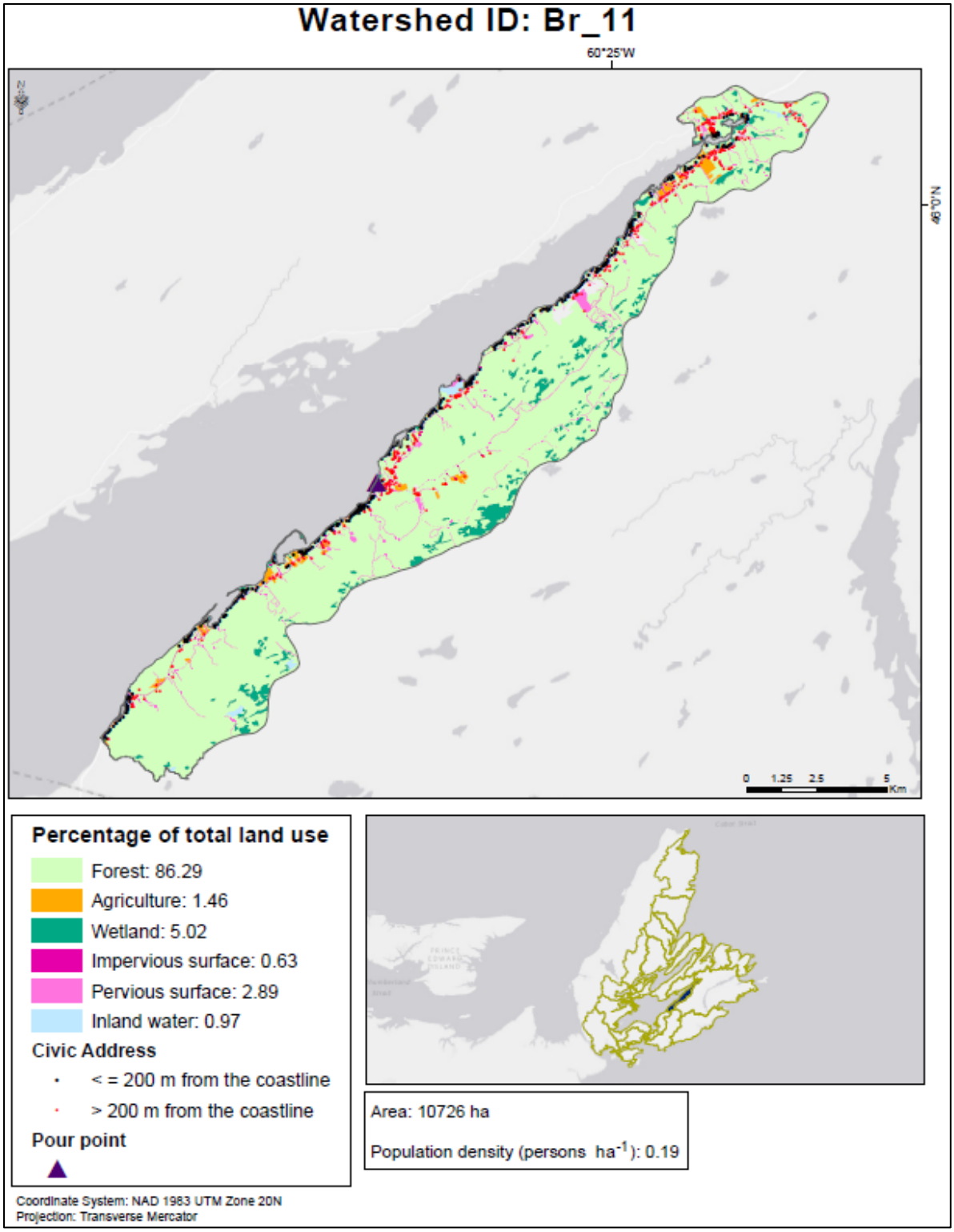


Figure 112. Land-use map for Bras d'Or Lake watershed Br_11. Insets: Watershed area and population density (lower right); location of watershed in relation to the Cape Breton Island sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

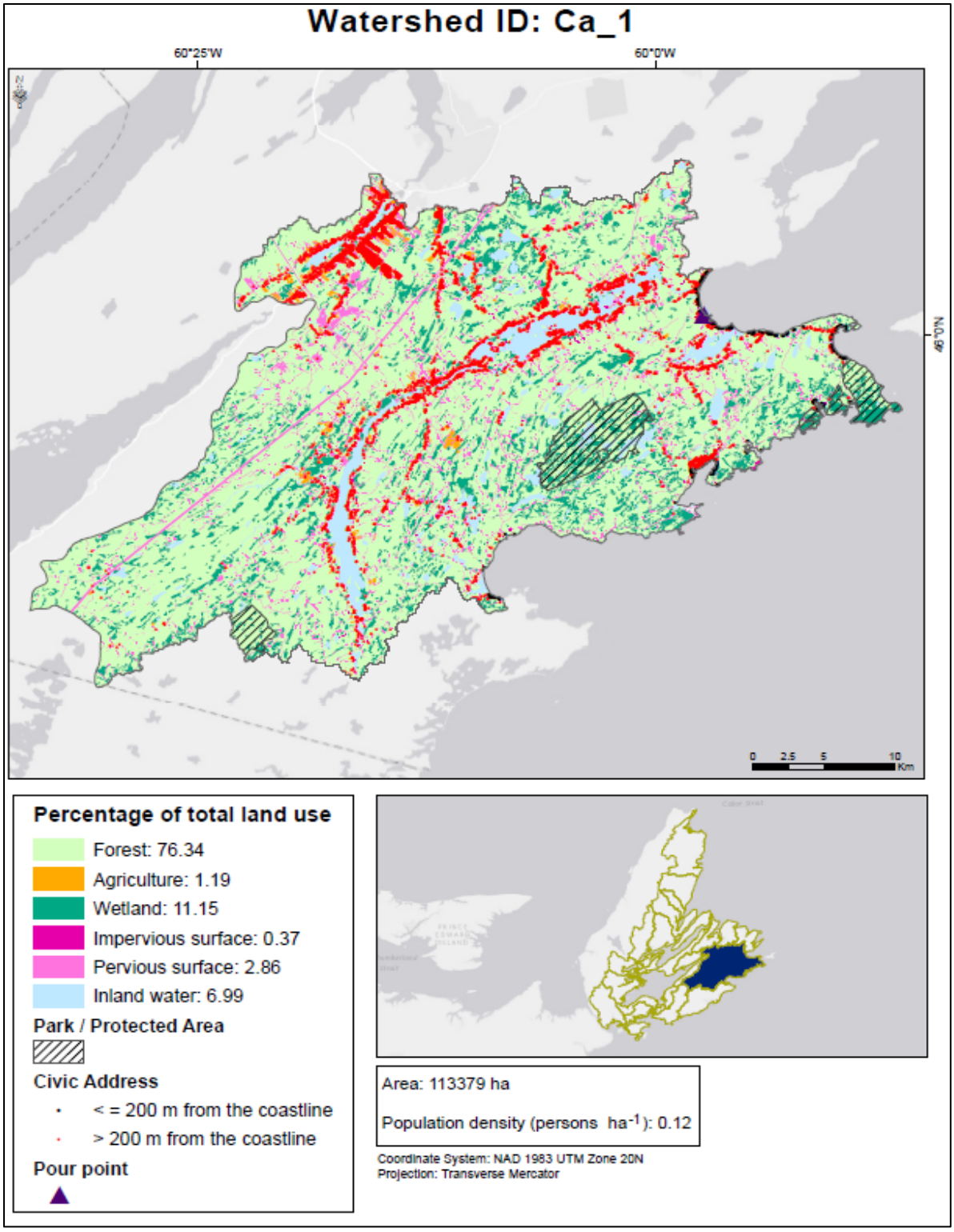


Figure 113. Land-use map for Cape Breton County watershed Ca_1. Insets: Watershed area and population density (lower right); location of watershed in relation to the Cape Breton Island sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

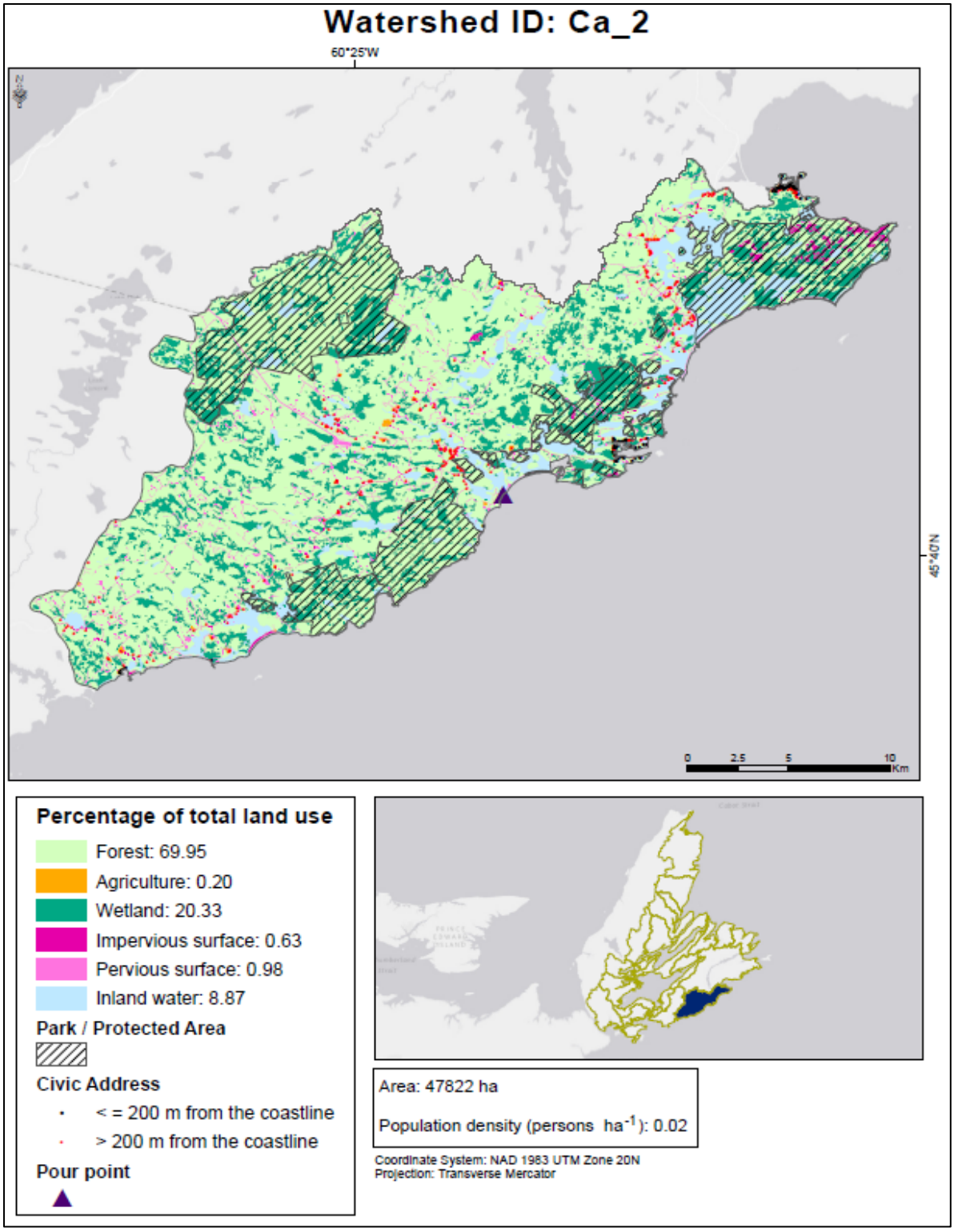


Figure 114. Land-use map for Cape Breton County watershed Ca_2. Insets: Watershed area and population density (lower right); location of watershed in relation to the Cape Breton Island sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

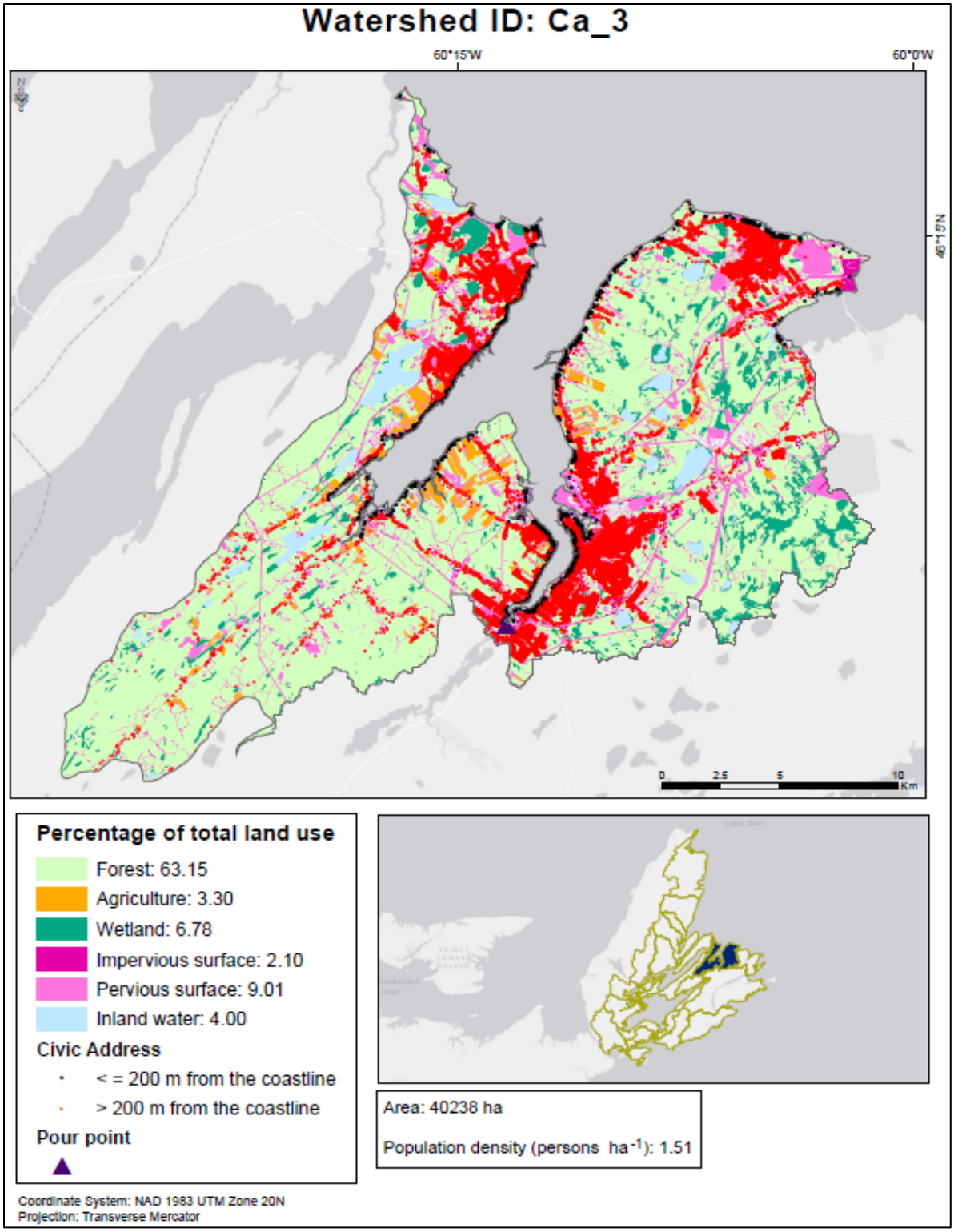


Figure 115. Land-use map for Cape Breton County watershed Ca_3. Insets: Watershed area and population density (lower right); location of watershed in relation to the Cape Breton Island sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

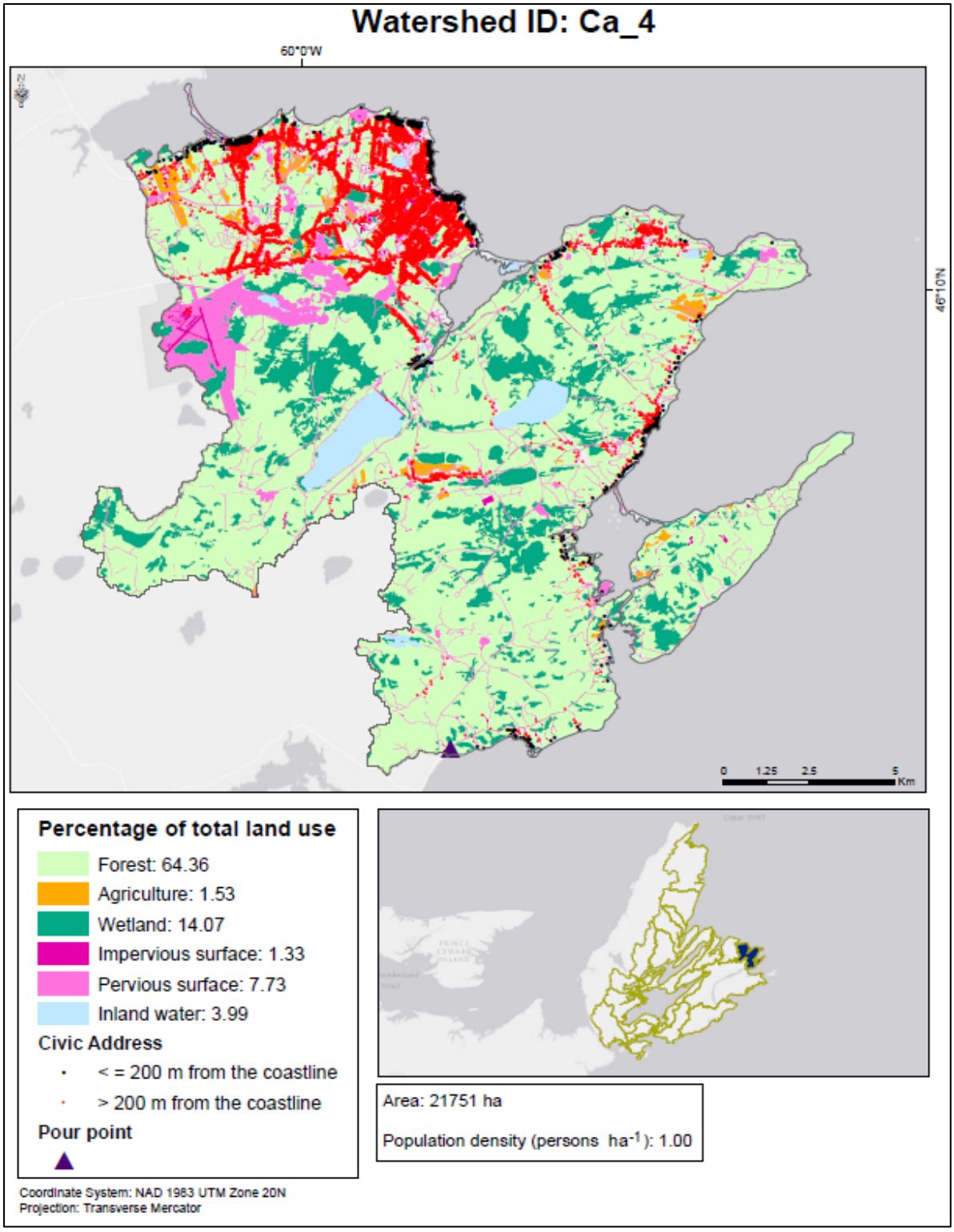


Figure 116. Land-use map for Cape Breton County watershed Ca_4. Insets: Watershed area and population density (lower right); location of watershed in relation to the Cape Breton Island sub-region (centre right); and percentage of total land-use (lower left). The black triangle represents the major pour point (largest outlet into the coastal zone).

APPENDIX

Table A.1. Adjusted Cape Breton Island sub-region watershed IDs as they appear in this technical report versus the original watershed IDs used in Kelly et al. (2021) . Watershed IDs were updated for this report in order to better reflect the geographical place names used in this area of the province.

Land Use Atlas watershed IDs	Kelly et al. (2021) watershed IDs
Vi_1	Ch_1
Vi_2	Ch_2
Vi_3	Ch_3
Vi_4	Ch_4
Ri_1	Gr_1
Ri_2	Gr_2
Ri_3	Gr_3
Ca_1	Mi_1
Ca_2	Mi_2
Ca_3	Mi_3
Ca_4	Mi_4
Br_7	Mi_5
Br_1	Hab_1
Br_2	Hab_2
Br_3	Hab_3
Br_4	Hab_4
Br_5	Hab_5
Br_6	Hab_6
Br_8	Hab_7
Br_9	Hab_8
Br_10	Hab_9
Br_11	Hab_10