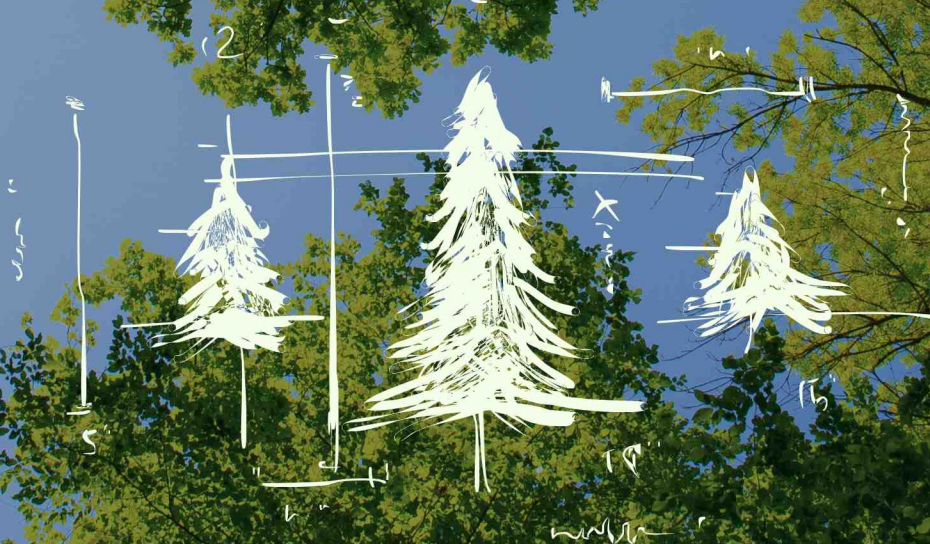


THE CITY OF CAMROSE

TREE DICTIONARY

**Changing with the Climate:
Mitigating Urban Heat Zones**

APRIL 2024



IN COLLABORATION WITH THE
UNIVERSITY OF ALBERTA

WHO WE ARE

WE ARE FIVE UNDERGRADUATE STUDENTS FROM THE UNIVERSITY OF ALBERTA IN OUR THIRD OR FOURTH YEARS, EACH WITH OUR OWN ACADEMIC BACKGROUNDS. THE CONTEXTS OF OUR DEGREES, INCLUDING PLANT BIOLOGY, BIOCHEMISTRY, TECHNOLOGY AND THE ENVIRONMENT, RESOURCE MANAGEMENT, AND ENVIRONMENTAL SCIENCE, ENABLE US TO LOOK AT WHAT GREENING CAMROSE ENTAILS AND HOW TO DO SO IN PARTNERSHIP WITH INTERESTED PARTIES. BELOW, YOU WILL FIND THE IMPLEMENTATION OF THESE COMPONENTS NOT ONLY FOR THE ADVANCEMENT OF THIS PROJECT, BUT ALSO AS A MEANS TO CONTINUE OUR EDUCATION WHILE TAKING THE STEPS TOWARD A HEALTHIER CAMROSE.

EXECUTIVE SUMMARY

THE PURPOSE OF THIS PROJECT IS TO PROVIDE A RESOURCE FOR THE CITY OF CAMROSE TO ADVISE WHERE, HOW, AND WHICH TREES OUGHT TO BE PLANTED IN PUBLIC SPACES. THE RECOMMENDATIONS MADE TAKE INTO ACCOUNT CURRENT AND PROJECTED INCREASES IN TEMPERATURE TO ENSURE CLIMATE RESILIENCE IN YEARS TO COME. IN THIS RESOURCE, WE IDENTIFY SPECIES WHOSE GROWTH REQUIREMENTS FALL IN THE OVERLAP BETWEEN CAMROSE'S CURRENT GROWING CONDITIONS AND THE CONDITIONS PROJECTED BY 2100 IN A HIGH-EMISSIONS SCENARIO, WITH AN EMPHASIS ON SPECIES THAT ARE DROUGHT TOLERANT AND DEER RESISTANT. FINALLY, WE HAVE NOTED EACH TREE'S WATER REQUIREMENTS AND TOXICITY TO HUMANS, PETS, AND WILDLIFE.

EXPECTED BENEFITS

FROM THE MIGHTY OAK TO THE SMALLEST MOSS, ALL PLANTS IMPACT OUR ECOSYSTEM AND, IN TURN, OUR WORLD. BY PLANTING TREE SPECIES THAT WILL THRIVE NOW AND IN THE DECADES FOLLOWING, WE CAN HELP TO MAINTAIN CAMROSE'S HEALTHY AND UNIQUE ENVIRONMENT. VEGETATION PROVIDE IMPORTANT PSYCHOLOGICAL BENEFITS FOR HUMANS. THE ABILITY OF TREES TO MITIGATE URBAN HEAT ISLANDS WILL REDUCE STRAIN ON INFRASTRUCTURE AND HEALTHCARE. IT IS ALSO IMPORTANT TO UNDERSTAND THE SECONDARY BENEFITS EACH SPECIES COULD PROVIDE, SUCH AS MEDICINE, FOOD SUPPLY, FRAGRANCE, INTERACTIONS WITH WILDLIFE, AND AESTHETIC ASPECTS, IN ORDER TO FULLY APPRECIATE THE VALUE OF URBAN FORESTS.



PROJECT TIMELINES

SEASONAL

SPRING AND SUMMER:

- PLANT TREES AND WATER (AS NEEDED)
- TREES SHOULD BE MONITORED BY CITY STAFF FOR SIGNS OF DESICCATION AND DISEASE.

AUTUMN:

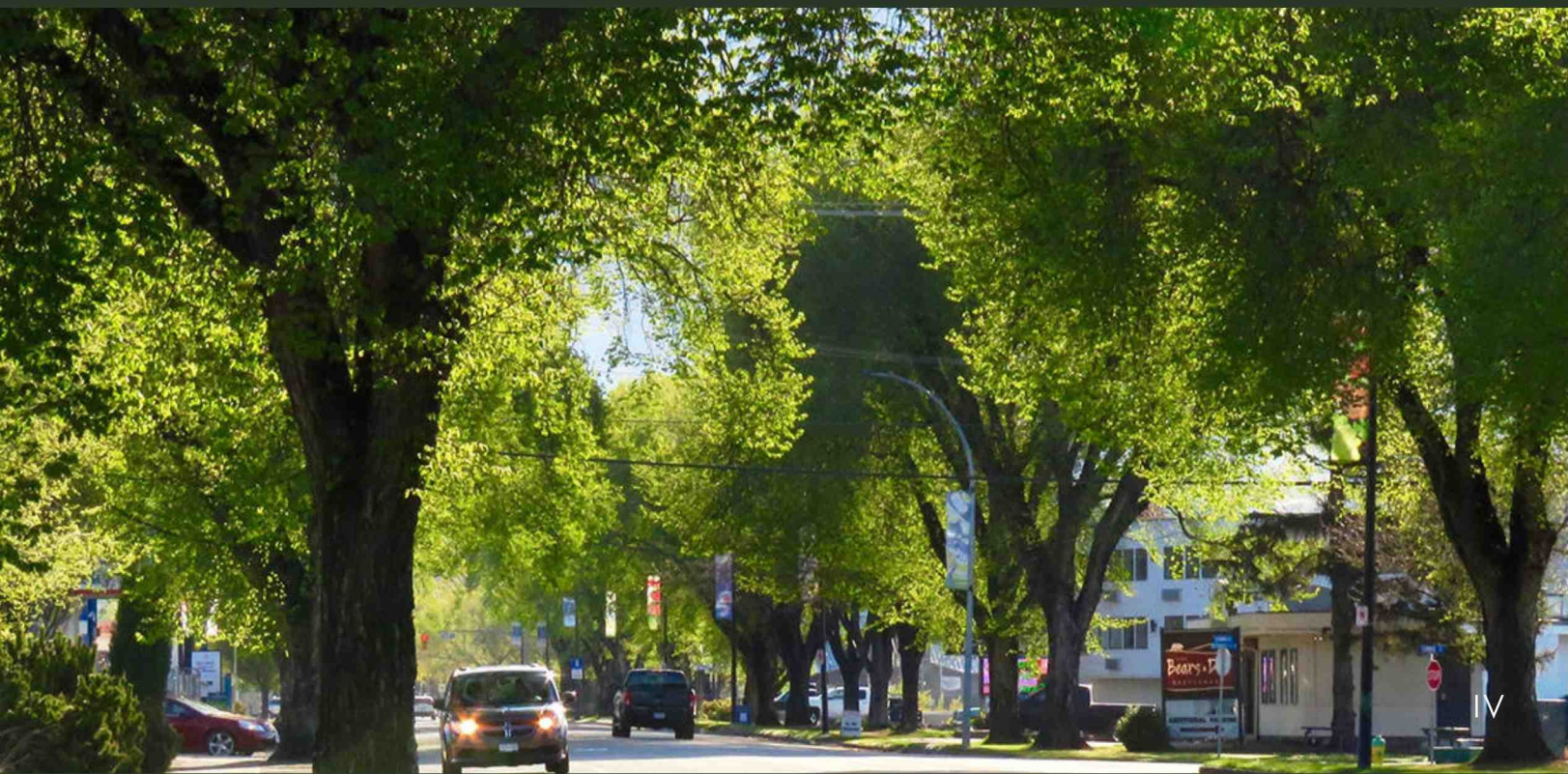
- MODERATE TEMPERATURES ALLOW NEW TREES TO ACCLIMATIZE IN A LESS-STRESSFUL ENVIRONMENT (8 BILLION TREES, 2023).
- TREES SHOULD BE PRUNED IN LATE AUTUMN TO EARLY WINTER, BEFORE ENTERING DORMANCY.

LONG-TERM

- ACCORDING TO PROJECTIONS FROM THE PACIFIC CLIMATE IMPACTS CONSORTIUM, THE NUMBER OF VERY HOT DAYS IN CAMROSE WILL HAVE INCREASED BY 7.4 BY THE YEAR 2050 (CLIMATE ATLAS OF CANADA, 2019).
- GIVEN THE DECADES-TO-CENTURIES LONG LIFESPAN OF TREES, IT MAY TAKE DECADES TO SEE THE FULL CULTURAL, ENVIRONMENTAL AND ECONOMIC IMPACTS OF TREES.
- A TREE PLANTED TODAY WILL NEED TO CONTEND WITH VASTLY DIFFERENT ENVIRONMENTS THROUGHOUT ITS LIFE.
- BY IMPLEMENTING OUR PLANTING RECOMMENDATIONS WITHIN THIS DOCUMENT, WE WILL BE ABLE TO PLANT TREES IN LOCATIONS WHERE THEY WILL BE HEALTHIEST AND LEAST LIKELY TO BE REMOVED TO ACCOMMODATE INFRASTRUCTURE. BY ALLOWING TREES TO GROW TO MATURITY, WE CAN HELP TO MITIGATE THE EFFECTS OF CLIMATE CHANGE AND OVERALL CREATE A MORE SUSTAINABLE CITY.

URBAN FORESTRY: BEST PRACTICES

- INCREASE DIVERSITY OF TREES PLANTED
- CREATE AND USE A GIS INVENTORY OF TREES IN CAMROSE TO ENSURE EQUITABLE AND DIVERSE URBAN FOREST COMPOSITION
- USE A LONG-TERM BUDGET MODEL IN ALLOCATING RESOURCES TO TREE CARE
- SOURCE TREES FROM REPUTABLE PROVIDERS TO MINIMIZE THE RISK OF INTRODUCING DISEASES OR PESTS
- MINIMIZE THE USE OF FERTILIZER AND USE MULCH AROUND THE BASE OF YOUNG TREES TO LIMIT WEEDS
- CONSIDER PLANTING SHRUBS OR GRASSES ON INCLINES, INSTEAD OF TREES
- CONSIDER ALL ASPECTS OF POTENTIAL PLANTING SITES, INCLUDING:
 - SOIL TYPE
 - AMOUNT OF WIND
 - SUN EXPOSURE



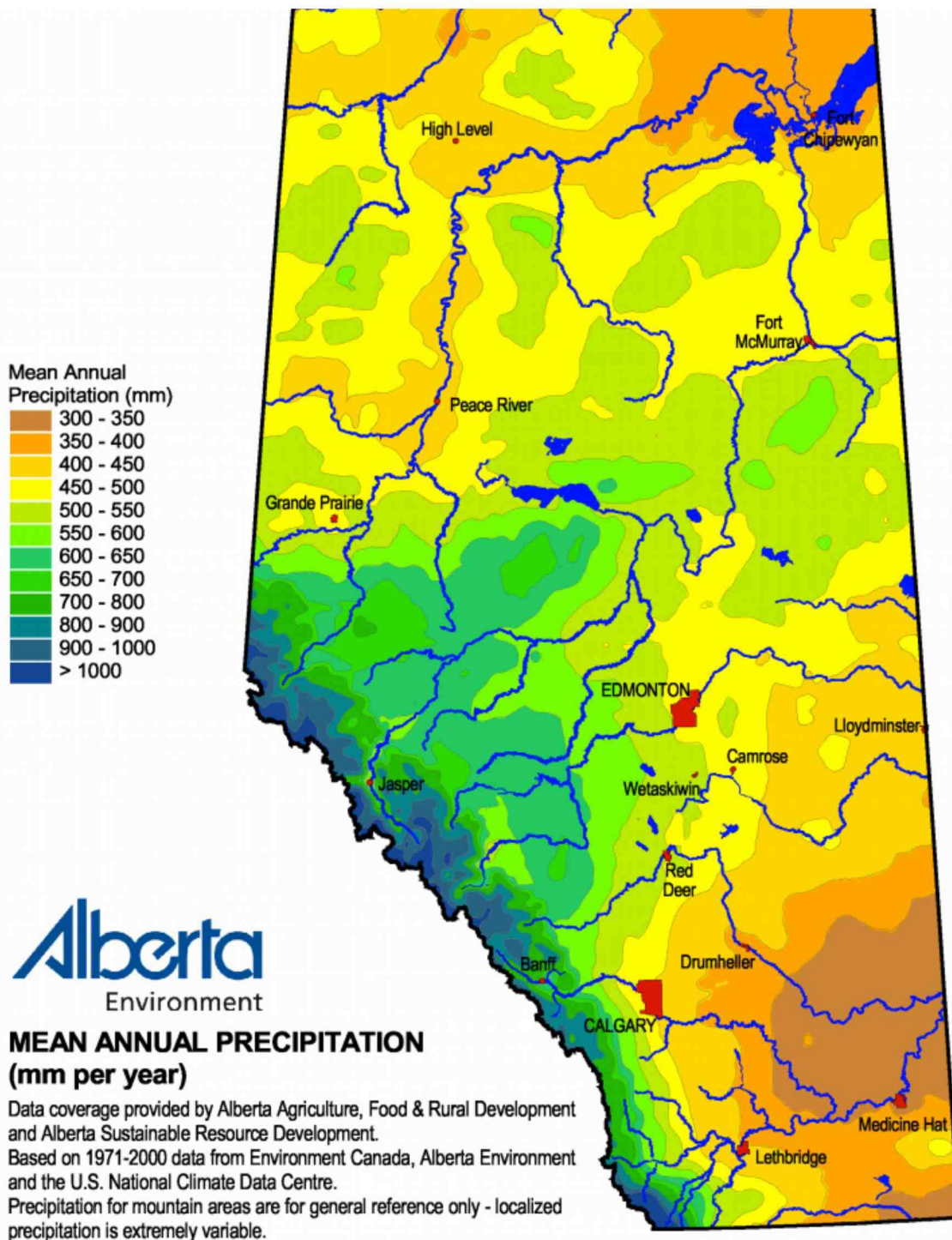
PROJECT RESOURCES: PRIMARY REFERENCE



CURRENT ALBERTA
USDA HARDINESS
ZONES:

Zone	Coldest Temp. Range
0a	> -54°C
0b	-54°C to -51°C
1a	-51°C to -48°C
1b	-48°C to -46°C
2a	-46°C to -43°C
2b	-43°C to -40°C
3a	-40°C to -37°C
3b	-37°C to -34°C
4a	-34°C to -32°C
4b	-32°C to -29°C
5a	-29°C to -26°C
5b	-26°C to -23°C
6a	-23°C to -21°C
6b	-21°C to -18°C
7a	-18°C to -15°C
7b	-15°C to -12°C
8a	-12°C to -9°C
8b	-9°C to -5°C
9a	-5°C to -3°C

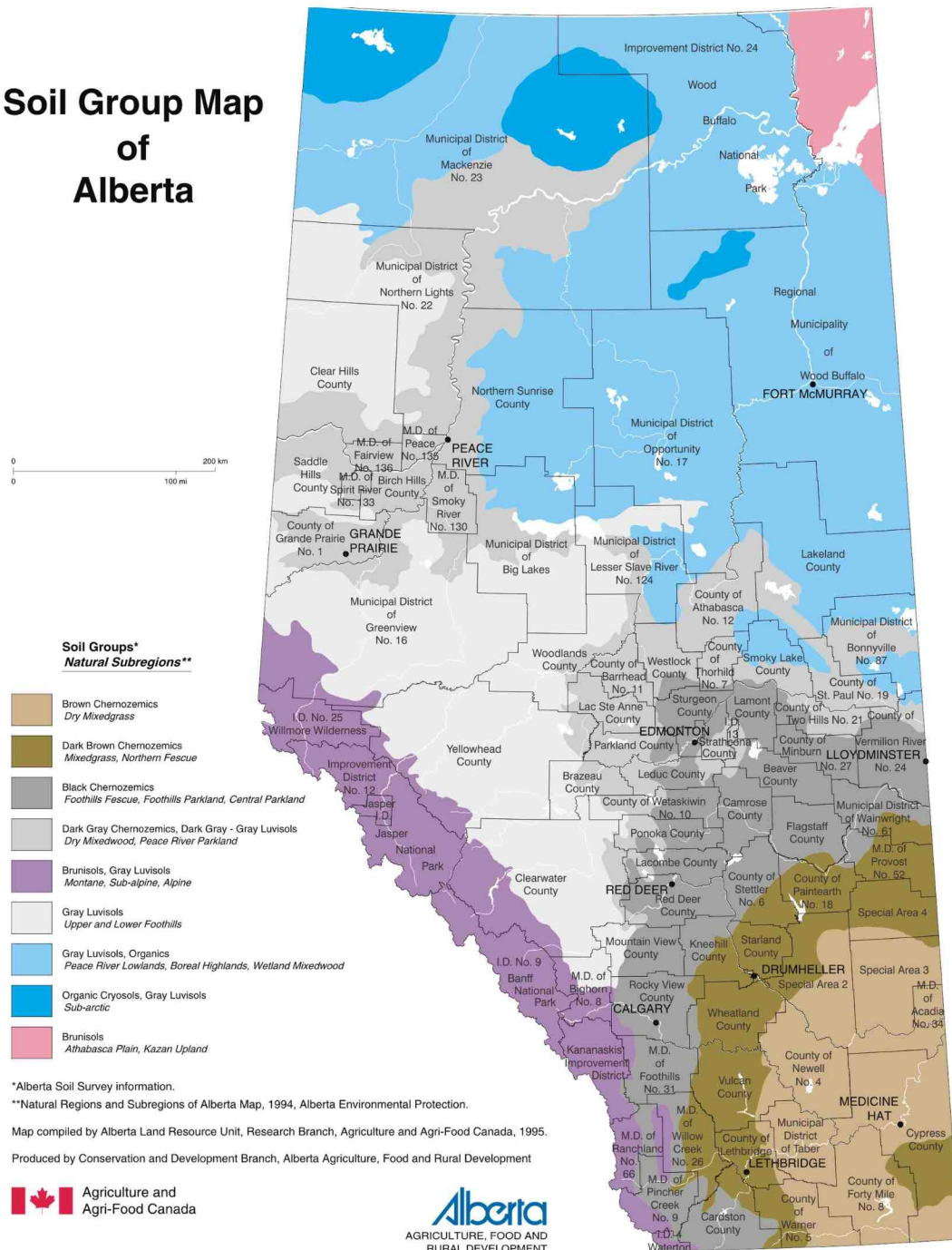
THE MAP ABOVE DETAILS THE VARIETY OF TEMPERATURES ALBERTA IS SUBJECT TO AND THE GENERAL COLD TEMPERATURE EACH LOCAL MAY EXPERIENCE. TYING INTO TREE SELECTION, FACTORING IN HARDINESS ZONES ENSURES NOT JUST THE SURVIVABILITY OF THE TREE, BUT ALSO ITS ABILITY TO THRIVE WITHIN THE CITY OF CAMROSE HARDINESS ZONE. THIS WILL BE DONE BY FOCUSING ON PLANTS THAT AT MINIMUM CAN SURVIVE A HARDINESS ZONE OF 2B BASED ON THE DATA PROVIDED IN THE MAP.



ALBERTA ANNUAL PRECIPITATION

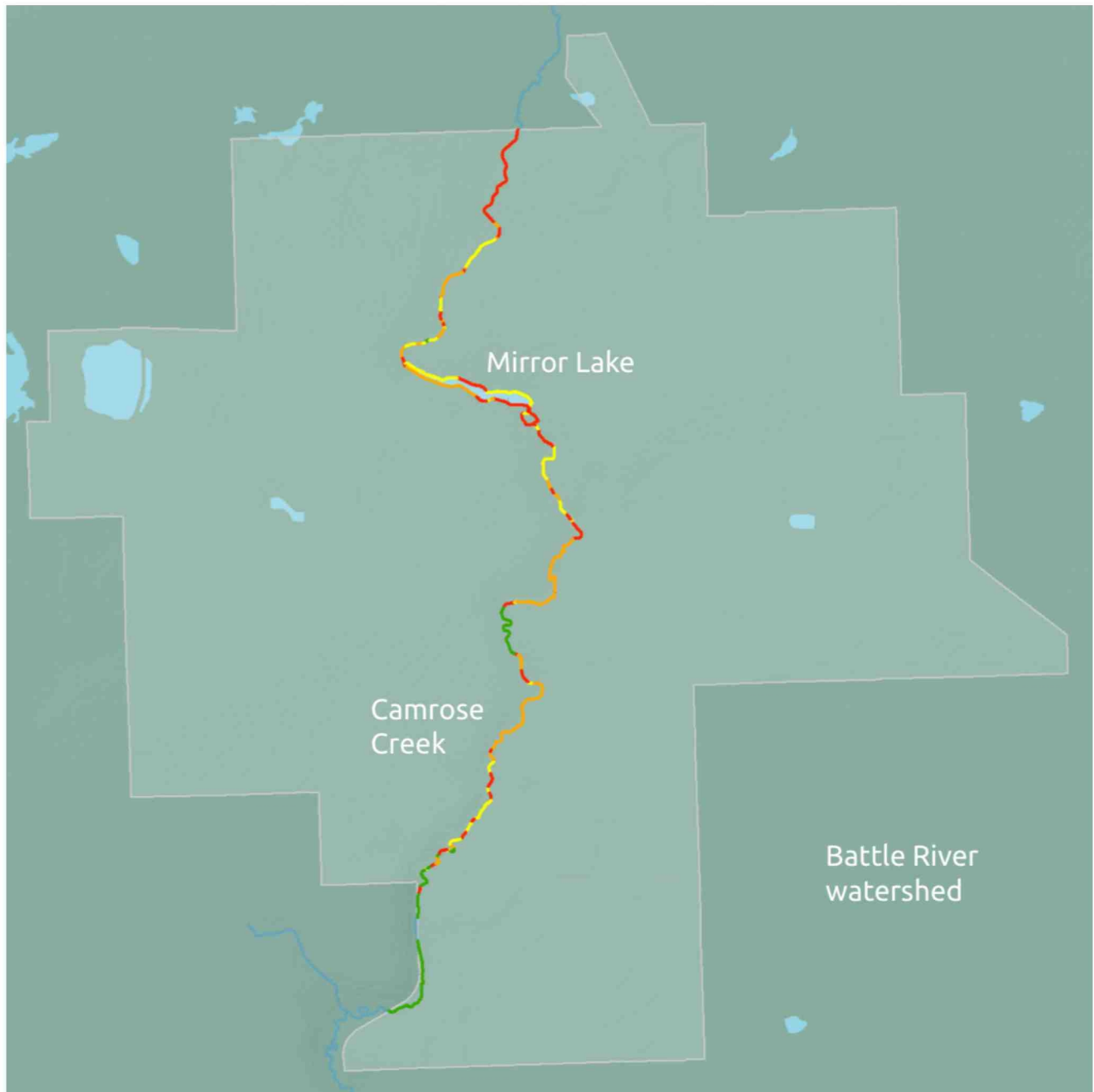
PRECIPITATION IS ANOTHER FACTOR INFLUENCING PLANT GROWTH AND PRODUCTION; CAMROSE'S LOCATION IN CENTRAL ALBERTA IS SUBJECT TO 450-500MM ANNUAL PRECIPITATION. FURTHERMORE, GIVEN THE LINK BETWEEN PRECIPITATION AND CLIMATE CHANGE, TREE SPECIES NEED TO BE IDENTIFIED WITHIN THESE ZONES SO THAT BOTH CAN SURVIVE IN THE CURRENT AND POSSIBLY LOWER RANGES OF WATER AVAILABILITY. IDENTIFYING CURRENT PRECIPITATION RANGES, POTENTIAL CHANGES TO THAT RANGE, AND THE IMPACT OF THAT CHANGE ON VEGETATION TYPES WILL HELP US DETERMINE WHAT SPECIES MAY SURVIVE IN THE EVOLVING ALBERTAN ENVIRONMENT.

Soil Group Map of Alberta



SOIL TYPES OF ALBERTA:

ALBERTA IS COMPOSED OF NUMEROUS GEOGRAPHIC REGIONS THAT ARE HOME TO UNIQUE ECOSYSTEMS. EACH GEOGRAPHIC REGION HAS A VARIETY OF FACTORS THAT CAN INFLUENCE SPECIES CONTINUANCE WITHIN THAT REGION. ONE SUCH OF THOSE FACTORS IS SOIL. DIFFERENT SOIL TYPES HOST UNIQUE NUTRIENT LEVELS, WATER RETENTION CAPACITY, AND BACTERIAL PROCESSES USED TO DETERMINE SPECIFIC PLANT SPECIES' SURVIVAL. FOR THE CAMROSE COMMUNITY, WE WOULD FOCUS ON PLANTS THAT THRIVE IN BLACK CHERMOZEMICS, WHICH CONTAIN PROPERTIES SUCH AS A WATER DEFICIT OF 6.5 TO 13 CM AND 5-8.5% ORGANIC MATERIAL COMPOSITION.



SHORELINE AND RIPARIAN CONDITION ASSESSMENT

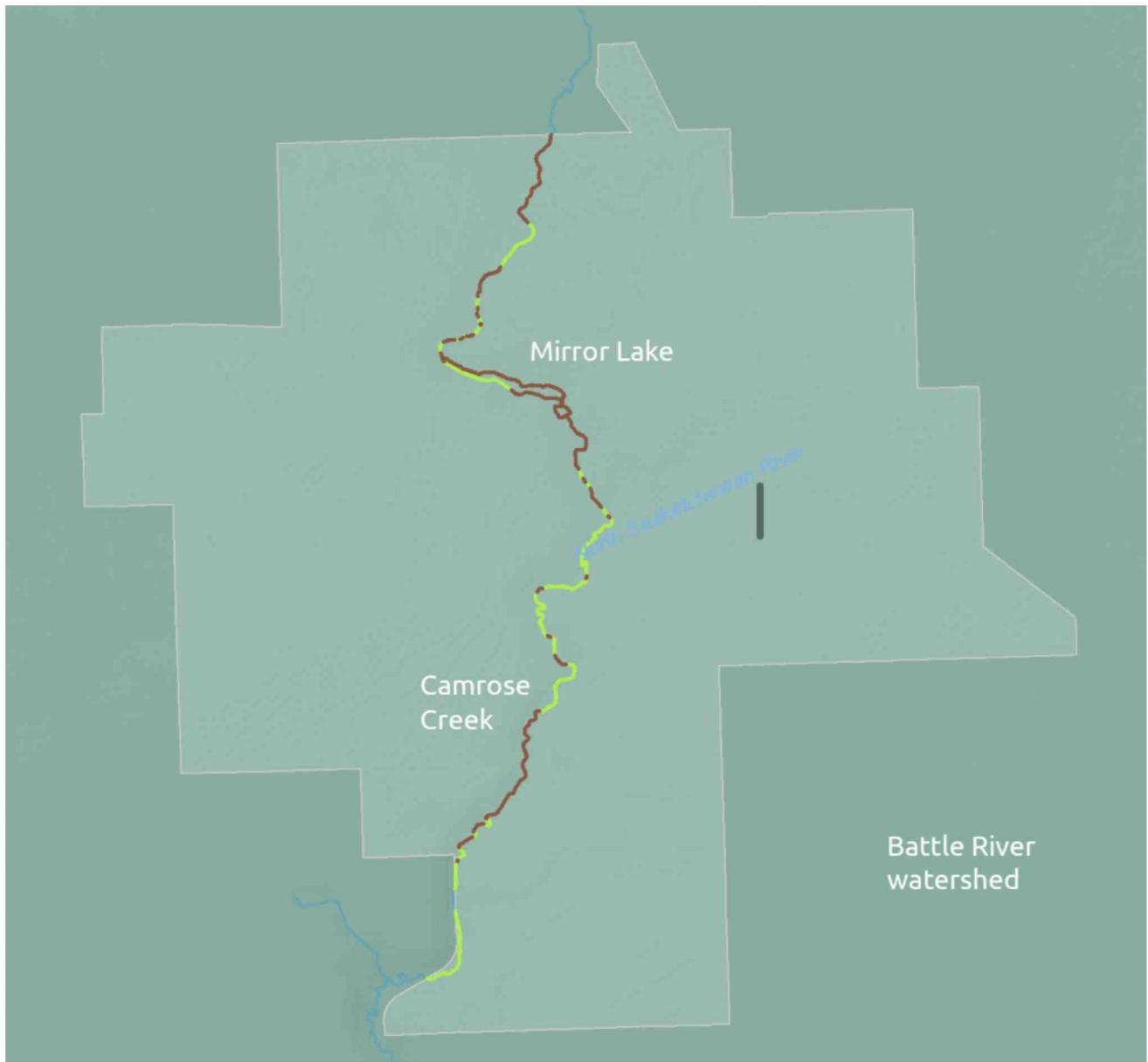
MAP ONE IS AN ASSESSMENT OF THE RIPARIAN INTACTNESS WITHIN THE MUNICIPALITY, A RESOURCE COMMISSIONED DIRECTLY FROM THE CITY OF CAMROSE. RELYING MAJORLY ON SATELLITE DATA, THE MAP DETAILS WHETHER THE NATURAL HABITAT HAS BEEN ALTERED OR IMPAIRED BY HUMAN ACTIVITY, THE PRESENCE, AND QUANTITY OF NATURAL AND WOODY VEGETATION, AS WELL AS THE SEVERITY OF THE HUMAN FOOTPRINT.

RED: Vegetation mostly cleared. Dominant human footprint.

ORANGE: Vegetation limited. Prevalent human footprint.

YELLOW: Vegetation present. Some human footprint.

GREEN: Vegetation present. Little human footprint.



SHORELINE AND RIPARIAN CONDITION ASSESSMENT

MAP TWO RATES RESTORATION AND CONSERVATION PRIORITIES. IT COMBINES BOTH INTACTNESS SCORES AND PRESSURE SCORES TO DETERMINE THE RIPARIAN ZONES UNDER THE GREATEST LANDSCAPE PRESSURES. CONSERVATION IS PRIORITIZED WHERE RIPARIAN INTACTNESS IS HIGH AND LANDSCAPE PRESSURE IS LOW, SO THAT THOSE AREAS MAY BE PRESERVED AS THEY ARE BEFORE RESTORATION MEASURES ARE NEEDED. CONVERSELY, RESTORATION IS PRIORITIZED WHERE RIPARIAN INTACTNESS IS LOW AND LANDSCAPE PRESSURE IS HIGH.

*BROWN: High
restoration priority*

*BEIGE: Moderate
restoration priority*

*GREEN: Moderate
conservation priority*

*DARK GREEN: High
conservation priority*



SHORELINE AND RIPARIAN CONDITION ASSESSMENT

MAP THREE PULLS FROM THE RESULTS OF MAPS ONE AND TWO AND ARE RECOMMENDATION-BASED FOR MEASURES OF BOTH CONSERVATION AND RESTORATION. WE HAVE TAKEN THESE AREAS INTO ACCOUNT ON THE FOLLOWING PAGE: SPECIFIC PLANTING LOCATIONS.

*YELLOW: Areas to
focus on conservation*

*PINK: Areas to focus on
restoration*

URBAN PLANTING ZONES: GENERAL

URBAN PARKLANDS: PUBLIC AREAS SURROUNDING PLAYGROUNDS AND CONCRETE WALKING PATHS, WHERE GRASS IS MOWED IN SUMMER AND VEGETATION IS TENDED REGULARLY.

NATURALIZED PARKLANDS: PUBLIC AREAS WITH MINIMAL INTERFERENCE FROM CITY REGARDING PLANT CHOICE OR MAINTENANCE. INCLUDES FORESTED AREAS AROUND SKI TRAILS IN ROTARY PARK AND STONY VALLEY, AND RIPARIAN AREAS INDICATED 'HIGH INTACTNESS' BY CAMROSE'S RIPARIAN CONDITION ASSESSMENT (2021).

RIPARIAN RESTORATION ZONES: RIPARIAN AREAS THAT HAVE BEEN DESIGNATED 'VERY LOW', 'LOW', OR 'MODERATE INTACTNESS' (CRCA, 2021).

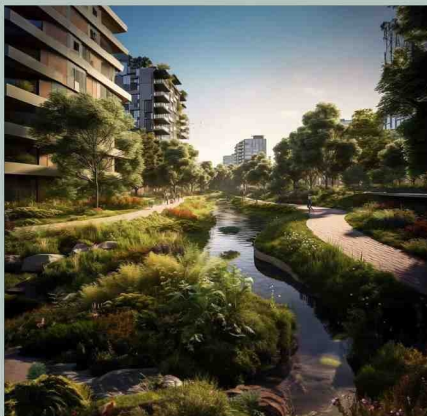
GOLF COURSE: ALL PROPERTY ENCOMPASSED BY THE CAMROSE GOLF COURSE.

SCHOOLYARDS: AREAS ON PUBLIC SCHOOL PROPERTIES.

STREET STRIPS: INCLUDES BOULEVARDS, PARKING LOT ISLANDS, AND STREET ISLANDS.

STOREFRONTS: AREAS BETWEEN THE CURB/SIDEWALK AND THE FRONT OF COMMERCIAL BUILDINGS, OFTEN GRAVELLED.

UTILITIES/AIRPORT: AREAS SURROUNDING THE CAMROSE WATER TREATMENT PLANT, SEWAGE TREATMENT, LANDFILL, ETC.



URBAN PLANTING ZONES: PARTICULAR

SOME OF THE MANY EXAMPLES FOR TREE PLACEMENT WITHIN THE CITY, BASED ON BOTH OBSERVATION AND AERIAL MAPPING.

NOTE ASTERISK (*),
SIGNALLING AN IDEAL
OPPORTUNITY FOR REAL,
DENSE URBAN FORESTRY AND
CANOPY SHADING, BOTH FOR
RESIDENTS/CITY EVENTS AND
REDUCING BUILDING
COOLING COSTS.

PARKS AND OPEN AREAS

FOUR SEASONS ROTARY PARK

- *HIGH RESTORATION ZONES WITH LOW RIPARIAN INTACTNESS*

MIRROR LAKE

- *HIGH RESTORATION ZONE*

DUGGAN PARK

- *ROADWAYS AND WALKING PATHS*

CAMROSE REGIONAL EXHIBITION EVENT GROUNDS

- *OPEN FIELD AREA*

ROTARY CENTRE/COMMUNITY CENTRE/RUDY SWANSON PARK*

- *BUILDING PERIMETERS*

CITY ASSETS

RING ROAD*

- *ROADWAY FROM CREEKVIEW HOMES TO THE CASINO*
- *ACROSS FROM THE NATURALIZATION PROJECT*
- *BOULEVARD SIDE OF THE BRIDGE GOING OVER THE VALLEY*

CAMROSE LIBRARY

- *FRONT ENTRY/BUILDING PERIMETER*

CITY HALL

- *BUILDING PERIMETER*

SCHOOLS

FIRE/POLICE DEPARTMENT

- *ROADWAY AND PARKING LOTS*

ECOLE COMPOSITE HIGH SCHOOL*

- *BUILDING PERIMETER*
- *PATHWAY THROUGH OPEN AREA*

AUGUSTANA

- *HOYME ROADWAY LEADING UPTO THE ART STUDIO*
- *RAVINE SIDE DOWN BY THE ROAD*

RESIDENTIAL

VALLEYVIEW

- *CENTRAL LAKE TRAIL*
- *AROUND BEND*

PARK PALACE SOUTH

- *BUILDING PERIMETER*
- *ROAD MEDIANS*

CITY SUPERCENTRE

- *FATBURGER ROADWAY MEDIAN*
- *SUPERSTORE PARKING LOT*
- *SAFEWAY PARKING LOT*
- *MEDIANS FROM OVERTIME TAP HOUSE TO SAVE ON FOODS*
- *MEDIANS FROM PEAVEY MART TO R&R*
- *MEDIANS IN FRONT OF HAPPY CHOPSTICK, SKYWAY, AND PIZZA 73*

NEW DOWNTOWN

THE BRICK

- *BUILDING PERIMETER*
- *ROADWAY*

CASINO

- *ROADWAY*
- *PARKING LOT*

UTILITIES AND INDUSTRY

INDUSTRIAL CAMROSE

- *ROADWAY*
- *MEDIANS FROM ROADWAY FROM UFA TO GMC*
- *MEDIANS ALONG NAPA*
- *FENCE LINE EVRAZ*

PERMA PIPE SIGN FOR NORTH GATE

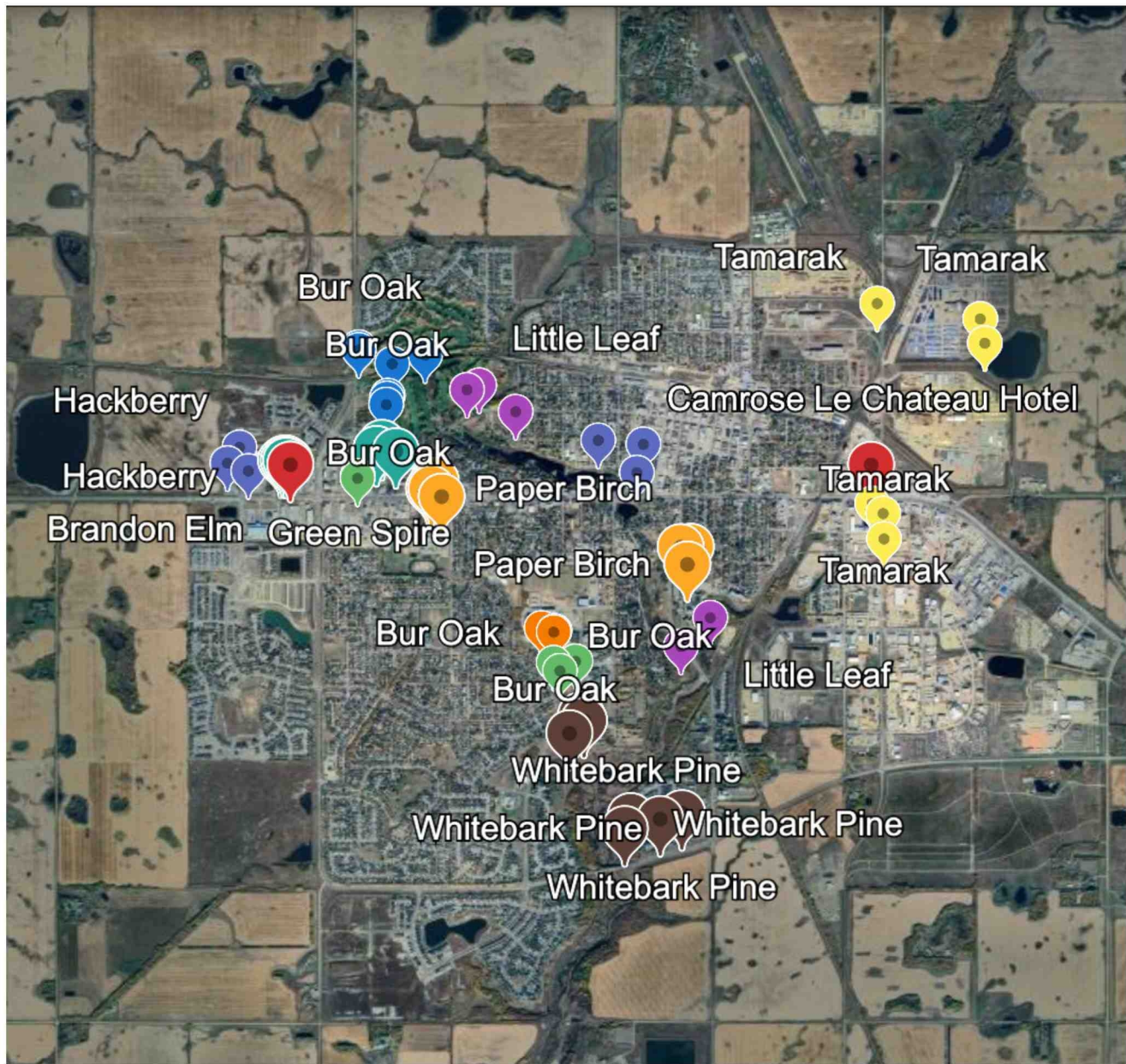
- *SURROUNDING SIGNAGE*
- *ROADWAY*

AIRPORT*

- *ROADWAY*
- *PARKING LOT*
- *TERMINAL ENTRY/BUILDING PERIMETER*

PROJECT RESOURCES: SECONDARY REFERENCE

CITY MAPPING



LINK TO GOOGLE EARTH MAP:

[HTTPS://EARTH.GOOGLE.COM/EARTH/D/1KMVD9KVHCRZTHXMOVLEDZ03OM0LTBDK3?USP=SHARING](https://earth.google.com/earth/d/1KMVD9KVHCRZTHXMOVLEDZ03OM0LTBDK3?USP=SHARING)



1

General:

- Hardiness zone: 3-8
- Hydrology: grows best through dry summers and damp winters
- Exposure: partial sun (young trees), full sun (mature trees)
- Height at maturity: 21-24 meters
- Width at maturity: 9-10 meters
- Soil requirements:
 - Clay, sandy or loamy
 - Alkaline, neutral, or acidic (pH 6.0-8.0)

2

Benefits:

- Drought tolerant
- Removes nearly 9 kg of nitrogen, sulfur, ozone and particulate matter from the atmosphere every year
- Acts as storm water control
- Provides shade and windbreak
- Has deep roots that penetrate the water table

Challenges:

- Intolerant of road salt and repeated flooding

3

Planting/Care Instructions:

- Requires regular watering until established
- Best maintained with regular pruning

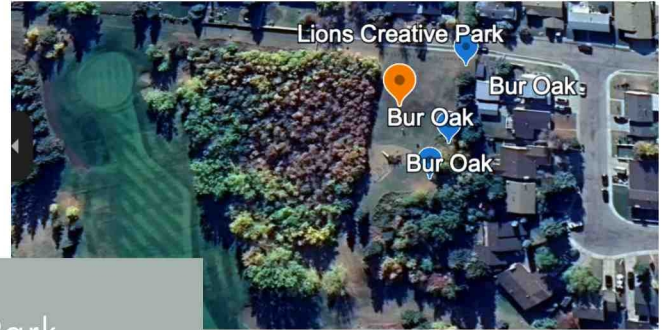
Information sources:

- <https://www.thespruce.com/growing-bur-oak-5091583>
- https://pressbooks.bccampus.ca/geoglabmanualv2/wp-content/uploads/sites/1340/2021/03/Quercus_macrocarpa.pdf

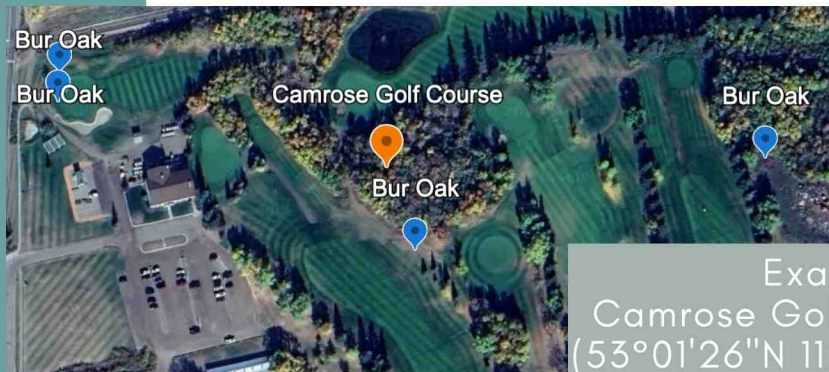
4

Urban Planting:

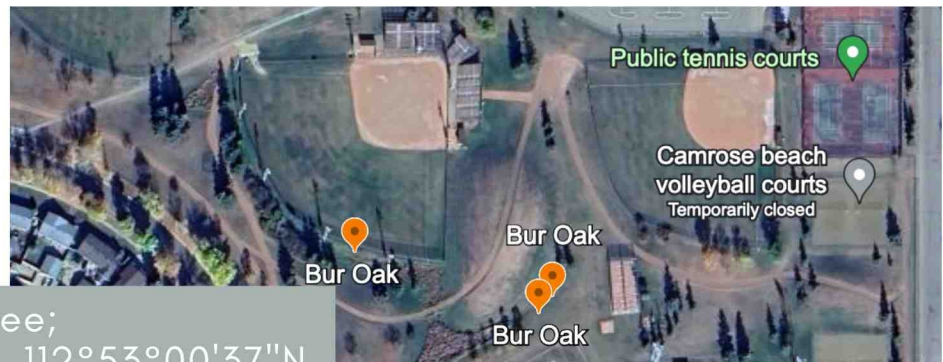
- Golf courses
- Parks
- Open fields



Example One:
Lions Creative Park
(53°01'20"N 112°51'04"W)



Example Two:
Camrose Gold Course:
(53°01'26"N 112°51'10"W)

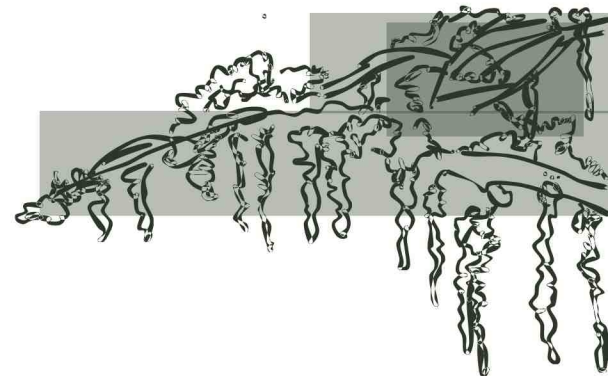


Example Three;
53°00'37"N 112°53°00'37"N
112°50'09"W"W

5

Interactions:

- Acorns can be consumed (roasted)
- Flowers late April to mid-June
- Supports pollinators





LITTLE LEAF LINDEN

TILIA CORDATA

1

General:

- Hardiness zone: 3-7
- Hydrology: prefers moisture and moderate drainage
- Exposure: full sun to partial shade
- Height at maturity: 18-21 meters
- Width at maturity: 6-15 meters
- Soil requirements:
 - Loamy, clay, sandy
 - Neutral to alkaline (pH 7.0-8.0)

2

Benefits:

- Is a reclamation plant
- Provides shade
- Non-invasive
- Resilient to poor growing conditions (heavy pollution, drought, compacted soil, poor drainage)
- Naturally deer-resistant

Challenges:

- Prone to attack from Japanese beetles (mostly an eastern province pest)
- Sensitive to road salt

3

Planting/Care Instructions:

- Best performance when planted in early Autumn
- No pruning required during the year
- May benefit from extra watering during summer if leaves are browning

Information sources:

- <https://mortonarb.org/plant-and-protect/trees-and-plants/little-leaved-linden/>

4

Urban Planting:

- Urbanized parks, school grounds
- Private properties



Example Two
Augustana Ravine:
53.010554, -112.822735



Example One:
Grand Drive, Mirror Lake
53.022837, -112.842123

5

Interactions:

- Supports pollinators
- Attracts moths
- Yellow/green flowers in spring



PRAIRIE SPIRE GREEN ASH

FRAXINUS
PENNSYLVANICA

1

General:

- Hardiness zone: 3-9
- Hydrology: non-particular with moderate drainage
- Exposure: full sun
- Height at maturity: 14-15 meters
- Width at maturity: 6-8 meters
- Soil requirements:
 - Clay, loam, sand
 - Acidic, neutral, alkaline (pH 5.0-8.0)

2

Benefits:

- Is a reclamation plant
- Provides shade
- Native to Alberta
- Resilient to poor growing conditions (heavy pollution, drought, compacted soil, poor drainage)
- Naturally deer-resistant

Challenges:

- Susceptible to Emerald Ash Borer

3

Planting/Care Instructions:

- Should be alternated with different tree species to prevent spread of disease

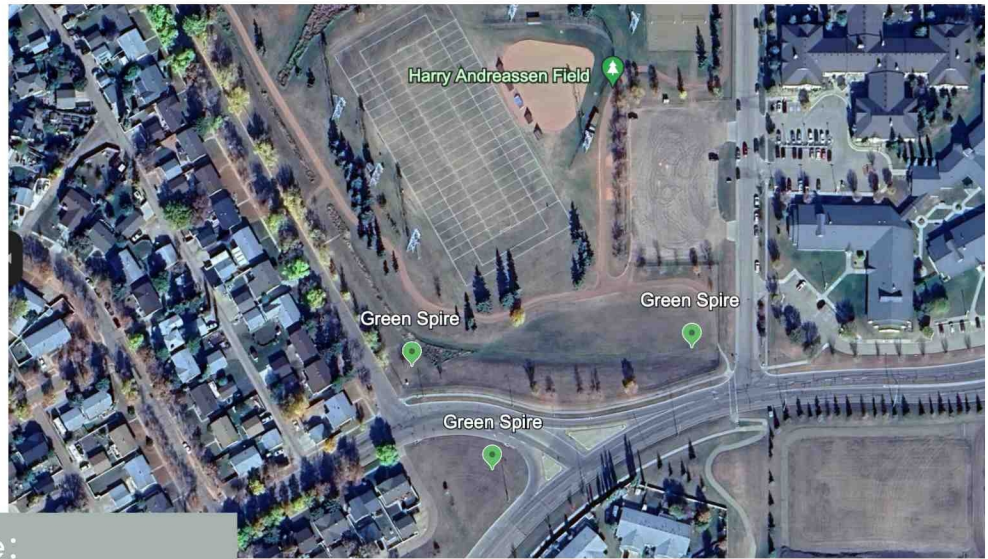
Information sources:

- <https://hort.ifas.ufl.edu/trees/frapena.pdf>

4

Urban Planting:

- Large parking lot islands
- Wide tree lawns
- Buffer strips around parking lots or for median strip plantings in the highway
- Sidewalk cutout (tree pit)
- Residential street tree
- Public parks



Example One:
Marler Drive
53°00'28"N 112°50'10"W

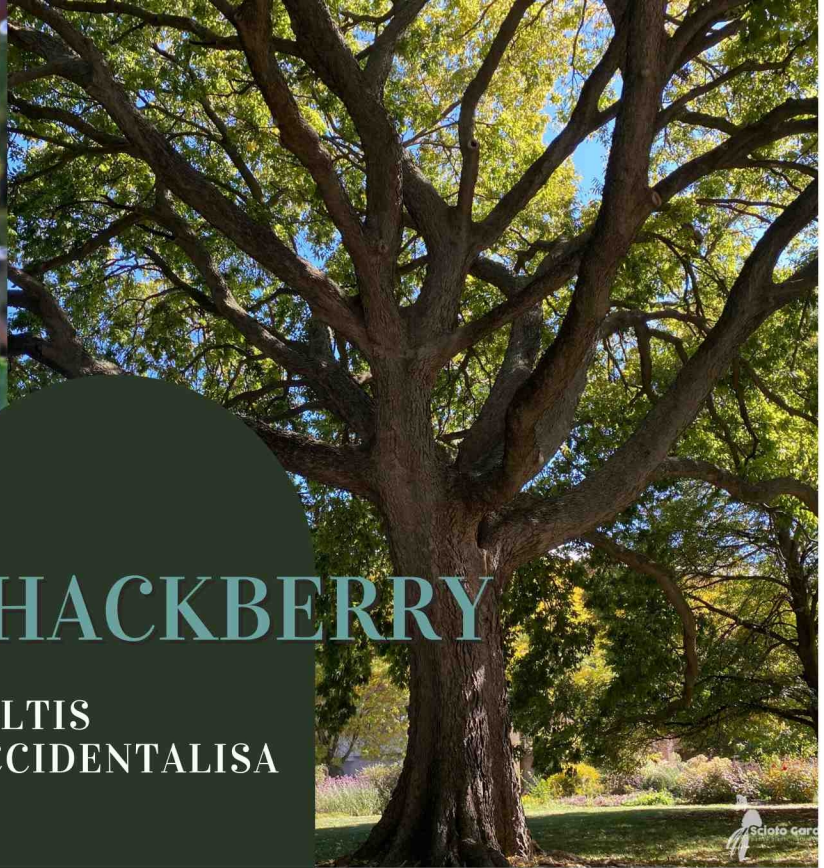


Example Two:
48th Ave Camrose:
(53.0172639N, -112.8547430)

5

Interactions:

- Attracts leaf rollers and caterpillars
- Can improve soil quality by increasing nutrient availability



HACKBERRY

CELTIS
OCCIDENTALISA

1

General:

- Hardiness zone: 2b-9
- Hydrology: requires low to moderate precipitation and moderate drainage
- Exposure: full or partial sun
- Height at maturity: 15-18 meters
- Width at maturity: 5-8 meters
- Soil requirements:
 - Moist fertile soil
 - Alkaline, neutral, acidic (pH 6.0-8.0)

2

Benefits:

- Provides shade and acts as a windbreak
- Drought tolerant
- Known to persist in disturbance, was the most damage resistant of the species evaluated following Hurricane Fran (USDA)
- Resiliency to power-line pruning
- Soil stabilizing, prevents erosion
- Road salt tolerant
- Roots grow downward in a narrow column, not disturbing pavement

Challenges:

- Preferred browsing species for white-tailed deer (USDA)

3

Planting/Care Instructions:

- Should be pruned in fall after the leaves have dropped or in early spring

Information Sources:

- <https://treecanada.ca/resources/trees-of-canada/northern-hackberry-celtis-occidentalis/>
- https://hort.ifas.ufl.edu/database/documents/pdf/tree_fact_sheets/celoccb.pdf

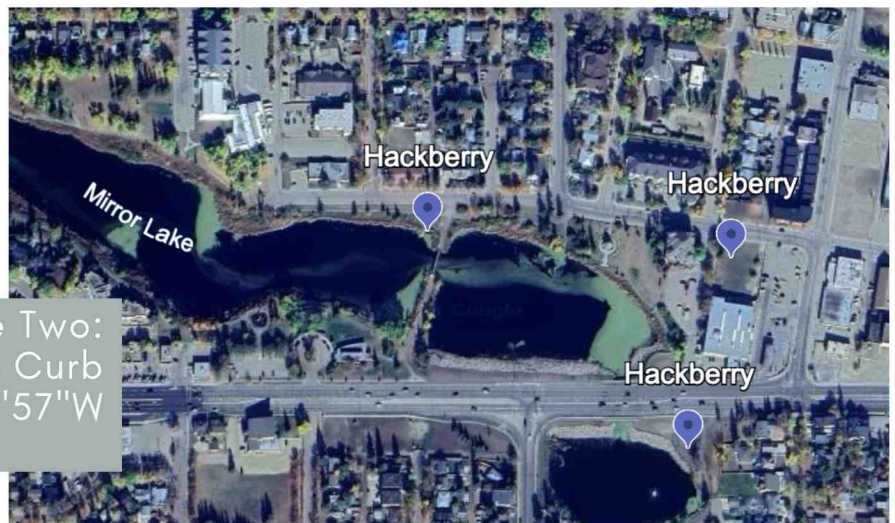
4

Urban Planting:

- Can be grown near roads
- Sidewalks
- Parking lot islands



Example One:
Walmart Parking Lot
53°01'08"N 112°51'56"W



Example Two:
Mirror Lake Curb
53°01'09"N 112°49'57"W

5

Interactions:

- Edible fruit with vitamins, provides food for deer, small mammals, birds, and sometimes, cattle
- Eaten by over 25 different species of song bird
- Supports pollinators
- Attracts birds and butterflies
- Can make meat seasoning from grinding Hackberry fruit and seeds (used by the Dakota)



TAMARACK

LARIX LARICINA

1

General:

- Hardiness zone: 2-5
- Hydrology: requires moderate to high precipitation
- Height at maturity: 12-24 meters
- Width at maturity: 4.5-9 meters
- Soil requirements:
 - Moist, fertile soil
 - Neutral or acidic (pH 6-7)

2

Benefits:

- Tolerant of unideal soil conditions
- Self-fertilize by seasonally dropping needles
- Naturally deer-resistant

Challenges:

- Intolerant of shady environments and competition
- May need supplemental water if un-established during a drought period

3

Planting/Care Instructions:

- Allow at least 5 meters between trees
- When tree is young (first 3 years after planting), water as needed during periods of drought and apply organic fertilizer

Information Sources:

- <https://www.thespruce.com/tamarack-tree-growing-guide-5196354>

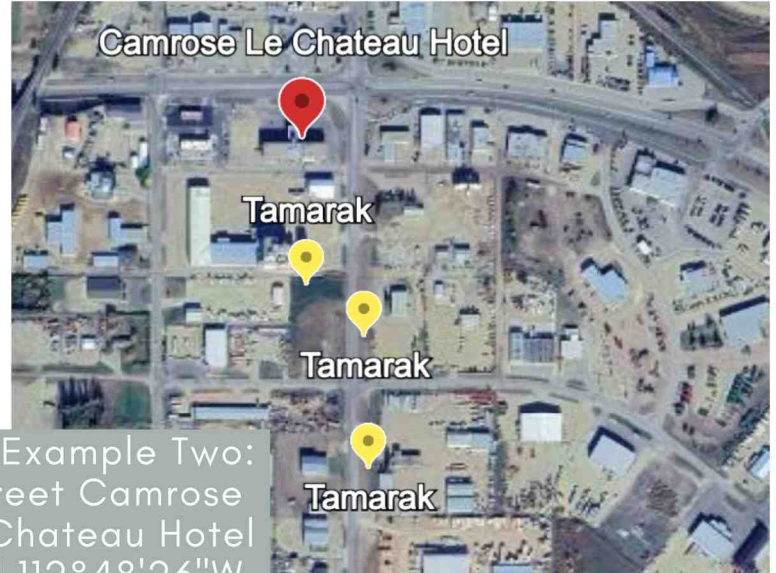
4

Urban Planting:

- Open areas, especially along creeks or near ponds
- Urban parks
- Private properties
- Golf course



Example One:
39th Street
Perma-Pipe Canada
53°01'29"N 112°47'48"W



Example Two:
39th Street Camrose
Le Chateau Hotel
53°00'57"N 112°48'26"W

5

Interactions:

- Edible fruit with vitamins, provides food for deer, small mammals, birds, and sometimes, cattle
- Eaten by over 25 different species of song bird
- Supports pollinators



BRANDON ELM

ULMUS AMERICANA

1

General:

- Hardiness zone: 2-6
- Hydrology: non-particular
- Exposure: full sun-partial shade
- Height at maturity: 12-15 meters
- Width at maturity: 8-10 meters
- Soil requirements:
 - Moist, well-drained soil
 - Non-particular to pH type

2

Benefits:

- High pollution resistant
- Road salt tolerant
- Quick growth rate
- Black Walnut tolerant
- Naturally deer-resistant

Challenges:

- Prone to elm scale
- At risk for Dutch Elm Disease

3

Planting/Care Instructions:

- Prune only in late winter, March or later, to avoid extreme cold

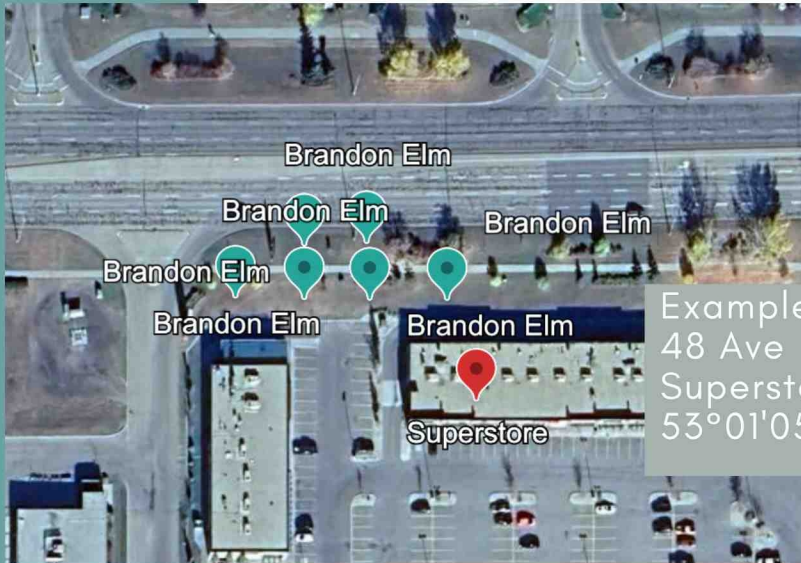
Information Sources:

- <https://www.sciencedirect.com/science/article/pii/S1618866722002187>
- <https://www.arborcare.com/blog/low-maintenance-trees-for-your-yard>
- <https://www.thespruce.com/tamarack-tree-growing-guide-5196354>

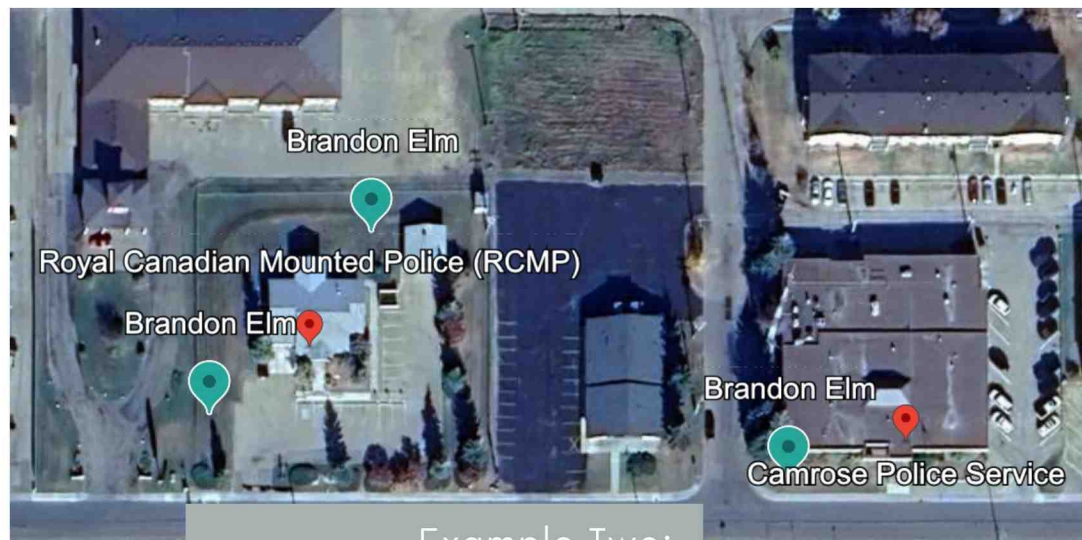
4

Urban Planting:

- Sidewalks and roads
- Residential yards



Example One:
48 Ave
Superstore
53°01'05"N 112°51'04"W



Example Two:
48 Ave
Camrose Police Station
53°01'07"N 112°51'08"W

5

Interactions:

- Naturally rabbit/rodent resistant
- Beautiful golden leaves during the fall season



PAPER BIRCH TREE

BETULA PAPYRIFERA

1

General:

- Hardiness zone: 2-6
- Hydrology: prefers moist soils with moderate drainage
- Exposure: full sun-partial shade
- Height at maturity: 10-15 meters
- Width at maturity: 5-8 meters
- Soil requirements:
 - Clay and loamy sands
 - Neutral or acidic (pH 5.0 - 6.5)

2

Benefits:

- Quick growth rate
- Blossoms in spring
- Naturally deer-resistant

Challenges:

- Root systems do not tolerate soil compaction
- Grown best away from road salts
- Susceptible to insects such as bronze birch borer, as well as some bacterias and fungi

3

Planting/Care Instructions:

- Best paired with evergreens such as balsam fir, white pine, or other deciduous trees
- Paper birch may form one or several trunks, so pruning must revolve around the central sprout. Paper birch does not require much pruning, however, as the tree tends to shed on its own

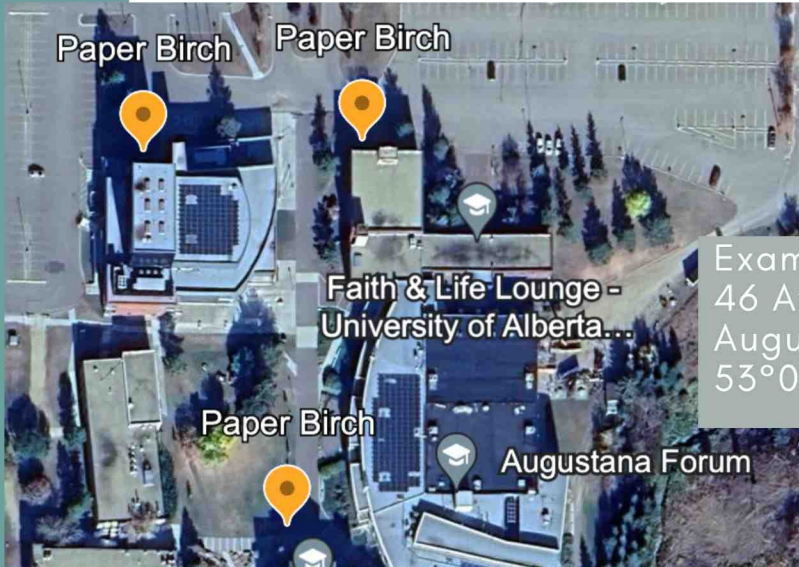
Information Sources:

- <https://www.thespruce.com/paper-bark-birch-growing-tips-3269342>
- <https://www.fs.usda.gov/nrs/pubs/na/NA-FR-02-97.pdf#page2>

4

Urban Planting:

- Low traffic areas
- Avoid overhead wiring
- The east and north sides of homes/buildings where the structure provides afternoon shade



Example One:
46 Ave
Augustana Campus
53°00'46"N 112°49'26"W



Example Two:
48 Ave
Ecole Composite Highschool
53°00'57"N 112°50'52"W

5

Interactions:

- Spring sapwells are invitational to hummingbirds
- Host butterfly caterpillars, such as the mourning cloak, and many moth caterpillars, provisioning protein for birds like nuthatches, blue jays, and brown creepers



WHITE BARK PINE

PINUS ALBICAULIS

1

General:

- Hardiness zone: 1- 7b
- Hydrology: semi-moist and moderate drainage
- Exposure: full sun
- Height at maturity: 12-18 meters
- Width at maturity: 1.5-2 meters
- Soil requirements:
 - Clay and loamy sands
 - Acidic or neutral (pH 5.5-6.5)

2

Benefits:

- Drought tolerant
- Provides food and shelter for wildlife
- Stabilize slopes, regulates runoff, and holds onto the snowpack
- Successfully inhabits rocky soils and cliff faces
- Considered an endangered tree species
- Naturally deer-resistant

Challenges:

- Susceptible to white pine blister rust and mountain pine beetle.

3

Planting/Care Instructions:

- Best to plant in early spring
- Do not require pruning

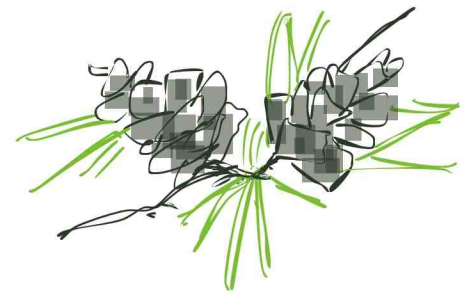
Information Sources:

- <https://parks.canada.ca/nature/science/conservation/feu-fire/feuveg-fireveg/veg-veg/pin-pine#>
- <https://www.gardenia.net/plant/pinus-albicaulis>

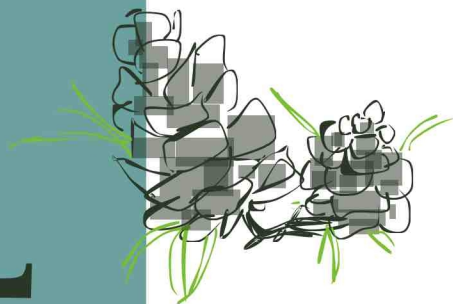
4

Urban Planting:

- Slopes along ring road
- Rocky grounds



Example One:
Ring Road
52°59'52"N 112°49'29"W



5

Interactions:

- Yields tasty, edible nuts
- Whitebark pine cones provide an excellent food source



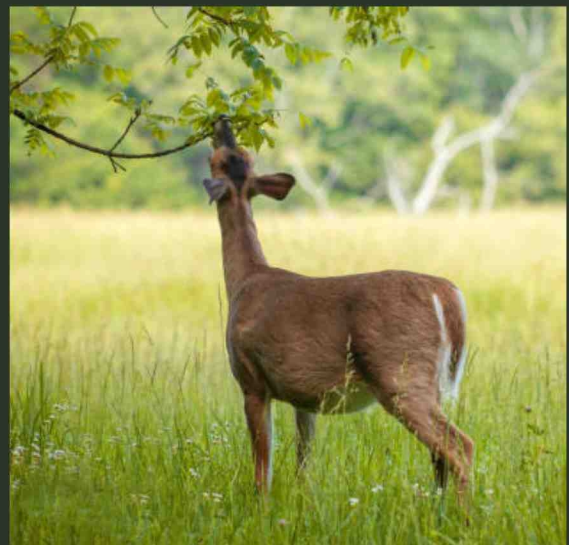
Example Two:
Stoney Creek Day-Use Park
Camrose Valley
53°00'11"N 112°50'01"W

DEER RESISTANCE

THE PRESENCE OF DEER WITHIN THE CITY OF CAMROSE IS AN INTEGRAL PART OF THE CITY'S ECOSYSTEM AND HAS A KEY ROLE IN THE FOOD CHAIN. DEER ACT AS PREY FOR APEX PREDATORS, GRAZE TO MAINTAIN PLANT EQUILIBRIUM, AND AID IN SEED DISPERSAL. HOWEVER, THE OVERABUNDANCE OF THE SPECIES HAS RESULTED IN EXCESSIVE PLANT MATTER CONSUMPTION AND CREATED DIFFICULTY FOR PLANT IMPLEMENTATION AT KEY FOCAL POINTS WITHIN THE CITY.

TO COMBAT THE HERBIVORY OF THE SPECIES, THIS DOCUMENT MAJORLY CONTAINS TREE SPECIES THAT ARE CONSIDERED RESISTANT TO DEER AND OTHER WILDLIFE CONSUMPTION PRIMARILY DUE TO THE PLANT'S UNAPPEALING NATURE TO THE ANIMAL. RATHER THAN USING COMMERCIAL REPELLENTS TO DETER THE DEER FROM AN AREA AND RELEASING ARTIFICIAL CHEMICALS INTO THE ATMOSPHERE, MANY TYPES OF TREES GIVE OFF A NATURAL SCENT, FLAVOR, OR TEXTURE THAT IS CONSIDERED UNDESIRABLE TO THE HERBIVORE FOR CONSUMPTION. AS SELECTIVE FORAGERS, DEER SEEK OUT SOME PLANTS AND AVOID OTHERS BASED ON NUTRIENT CONTENT AND POSSIBLY TASTE, ENABLING SELECT TREE SPECIES TO PROVIDE A NATURAL ECO-FRIENDLY BARRIER FOR NEIGHBORHOOD YARDS TO REPEL DEER. THE IMPLEMENTATION OF DEER-RESISTANT PLANTS CAN ACT AS A NATURAL BARRIER IN PLACE OF FENCES TO DETER DEER HERBIVORY. AFTER ALL, WHY WOULD A DEER CROSS THE STREET FOR ITS LEAST FAVORITE SNACK?

AN IMPORTANT NOTE IS THAT IN FOOD SCARCITY, THE DEER'S EATING PATTERNS WILL CHANGE TO IMPROVE SURVIVAL REGARDLESS OF PREFERENCE, SO WHILE THE SPECIES ARE CONSIDERED DEER RESISTANT, THEY CAN STILL BE AT RISK FOR DEER CONSUMPTION IN EXTREME CIRCUMSTANCES.



SEEDS/SOURCING

TREETIME (PROVIDES DELIVERY SERVICE)

WEBSITE: [HTTPS://TREETIME.CA/](https://treetime.ca/)

PHONE: (844) 873-3700

- BRANDON ELM
- PAPER BIRCH
- WHITEBARK PINE
- HACKBERRY
- TAMARACK
- LITTLE LEAF LINDEN
- BUR OAK

PRAIRIE GARDENS

WEBSITE: [HTTPS://PRAIRIEGARDENS.ORG/SHOP/TREE-NURSERY/ORNAMENTAL-TREES-TREE-NURSERY/BUR-OAK/](https://prairiegardens.org/shop/tree-nursery/ornamental-trees-tree-nursery/bur-oak/)

PHONE: (780) 921-2272

- BUR OAK
- LITTLE LEAF LINDEN
- PAPER BIRCH

GREENLAND GARDEN CENTER

WEBSITE: [HTTPS://GREENLANDGARDEN.COM](https://greenlandgarden.com)

PHONE: (780) 467-7557

- PAPER BIRCH
- BRANDON ELM
- GREEN SPIRE ASH
- BUR OAK

SUNSTAR NURSERIES

WEBSITE: [HTTPS://WWW.SUNSTARNURSERIES.COM](https://www.sunstarnurseries.com)

PHONE: (780) 472-6103

- PAPER BIRCH
- GREEN SPIRE ASH
- TAMARACK
- BURR OAK
- LITTLE LEAF LINDEN
- BRANDON ELM
-

SHERWOOD FORESTS

WEBSITE: [HTTPS://SHERWOODS-FORESTS.COM](https://sherwoods-forests.com)

PHONE: (780) 848-2548

- PAPER BIRCH
- GREEN SPIRE ASH
- TAMARACK
- BURR OAK
- LITTLE LEAF LINDEN
- BRANDON ELM
- HACKBERRY

ARROWHEAD NURSERIES

WEBSITE: [HTTPS://WWW.ARROWHEADNURSERIES.COM](https://www.arrowheadnurseries.com)

PHONE: (780) 472-6260

- PAPER BIRCH
- GREEN SPIRE ASH
- TAMARACK
- LITTLE LEAF LINDEN
- BRANDON ELM

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