A Preference-Based Optimization Model for Fishing Planning in Quebec Zone 8

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1 Business Background

A fishing trip in Quebec Zone 8 involves many intertwined choices that directly shape an angler's outcome and enjoyment. Within limited time and travel capacity, the angler must decide which district to visit, which subset of sites to include, and how to move between them. At each site, they choose what to target and which bait class and rod length to use, while adjusting time spent based on expected conditions. These decisions are further constrained by government rules on open seasons, allowable methods, bag limits, and legal length ranges. Because anglers value species, bait styles, and rod setups differently, the same trip can be highly rewarding for one person and disappointing for another. This project builds a single trip planning model that translates site information, regulatory limits, and user preferences into one coherent plan, maximizing the angler's overall utility while ensuring full compliance and realistic travel feasibility.

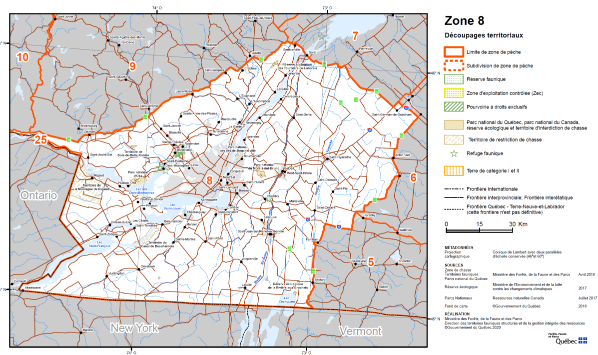

Figure 1: Zone 8

1.1 The Decision Framework and Utility Drivers

The core of this optimization problem is the maximization of **Total Utility**. As defined in our initial formulation, utility is not merely a function of catching fish, but a weighted aggregate of four ecological attributes:

1. **Habitat Suitability:** The objective quality rating of the site.
2. **Potential Fish Size:** The trophy quality of the target species.
3. **Threat Level:** The physical danger or nuisance level (e.g., invasive species).
4. **Conservation Status:** The rarity value based on IUCN ratings.

1.2 Regulatory Constraints

These decisions are strictly constrained by government rules. The Ministry of Forests, Wildlife and Parks enforces open seasons and bag limits that vary by species. Figure 4 illustrates the "Temporal Feasibility Windows." A feasible solution vector (i, s, t) must exist within the open season window (T_{open}) defined for that species.

Furthermore, the model must respect catch retention limits $(K_{i,s,t})$ as detailed in Table 4.

1.3 Project Objective

The objective is to maximize the angler's overall utility Z, ensuring compliance with all constraints. The model balances the **Base Utility** (ecological quality) and **Preference-Augmented Utility** (user-selected species/bait bonuses) against the opportunity cost of time consumed by travel $(\tau^D_{i,j})$ and preparation (P_{prep}).

2 Utility Function Formulation

To accurately model the angler's satisfaction, we define a comprehensive utility function for a fishing trip in Quebec Zone 8. Let $i \in I$ denote a candidate fishing site, belonging to a district $d(i) \in \mathcal{D}$. Let $s \in S$ denote a target fish species, $t \in T$ a bait category, and $r \in R$ a rod-length class. The total utility derived from a chosen strategy (i, s, t) is composed of three distinct components: an objective assessment of environmental quality, the user's subjective preferences, and the direct satisfaction derived from the catch outcome.

2.1 Base Utility

The first component is the objective **Base Utility**, which evaluates the inherent quality of a specific site-species combination. To quantify this, we incorporate four key ecological attributes:

- **Habitat Suitability:** Derived from the site's quality rating.
- **Potential Fish Size:** A score representing the trophy quality of the target species.
- **Threat Level:** Reflecting the physical danger or nuisance level to humans.
- **Conservation Status:** Based on IUCN ratings (reflecting rarity value).

Normalization: Since these attributes are measured on different scales, we apply min-max normalization to map all values into a standardized unit interval $[0, 1]$. This normalized value is denoted by the tilde symbol $(\tilde{\cdot})$.
Weighting Calibration: To determine the relative importance of these attributes, we conducted structured interviews and questionnaires with experienced local anglers. The empirical consensus

indicated a clear priority for habitat quality and fish size. Accordingly, we assigned the following weights to reflect these community values:

$$w_{hab} = 0.2, \quad w_{size} = 0.2, \quad w_{threat} = 0.1, \quad w_{status} = 0.1.$$

The Base Utility is then calculated as the weighted sum of these normalized attributes:

$$U_{i,s}^{base} = w_{hab} \cdot \widetilde{habitat}_i + w_{size} \cdot \widetilde{size}_{i,s} + w_{threat} \cdot \widetilde{threat}_s + w_{status} \cdot \widetilde{status}_s. \tag{1}$$

3 Preference-Augmented Utility

While Base Utility captures objective quality, individual satisfaction is significantly driven by personal preference. We treat user preferences as **exogenous binary inputs**: the angler selects a subset of preferred species, baits, and rod lengths before the optimization begins. These selections activate additive utility bonuses calibrated from our survey data.

3.1 Preference Parameters

Let $\mathcal{S}_{user} \subseteq S$, $\mathcal{T}_{user} \subseteq T$, and $\mathcal{R}_{user} \subseteq R$ denote the sets of species, baits, and rod lengths selected by the user. The utility bonuses are defined as follows:

- α_s: Species bonus. If species $s \in \mathcal{S}_{user}$, a high priority bonus is applied.
- β_t: Bait bonus. If bait $t \in \mathcal{T}_{user}$, a medium preference bonus is applied.
- δ_r: Rod bonus. If rod $r \in \mathcal{R}_{user}$, a minor comfort bonus is applied.

3.2 Calibrated Bonus Functions

The magnitude of these bonuses was calibrated to reflect the relative intensity of angler preferences (e.g., catching a target species is valued much higher than using a preferred rod).

Species Preference. The species bonus α_s is assigned a value of 1.7 (the highest weight) if the species is in the user's target list:

$$\alpha_s = \begin{cases} 1.7, & \text{if } s \in \mathcal{S}_{user}, \\ 0, & \text{otherwise.} \end{cases} \tag{2}$$

Bait Category Preference. We define the set of bait categories T and the corresponding preference bonus $\beta(t)$ side-by-side. The bonus applies if the bait t belongs to the user's selected subset $\mathcal{T}_{user}$.

$$\text{Categories: } \begin{cases} \text{Soft} \\ \text{Hard} \\ \text{Natural} \end{cases} \qquad \beta(t) = \begin{cases} 0.5, & \text{if } t \in \mathcal{T}_{user}, \\ 0, & \text{otherwise.} \end{cases} \tag{3}$$

Rod Length Preference. Fishing sites require specific rod lengths $r(i)$ for optimal performance. We define the standard length ranges for set R on the left, and the compatibility bonus $\delta(r(i))$ on the right:

$$\text{Ranges: } \begin{cases} \text{Short:} & 5'6'' - 6'0'' \\ \text{Medium:} & 6'6'' - 7'0'' \\ \text{Long:} & 7'0'' - 8'0'' \end{cases} \qquad \delta(r(i)) = \begin{cases} 0.1, & \text{if } r(i) \in \mathcal{R}_{user}, \\ 0, & \text{otherwise.} \end{cases} \tag{4}$$

3.3 Total Preference-Adjusted Utility

The final utility coefficient for a fishing strategy (i, s, t) combines the base utility with the calibrated preference bonuses. This coefficient represents the marginal utility gained *per hour* of active fishing:

$$U_{i,s,t} = U_{i,s}^{base} + \alpha_s + \beta(t) + \delta(r(i)). \tag{5}$$

3.4 Catch and Retention Utility

Finally, we model the utility derived from the fishing outcome itself. Our interviews indicate that anglers derive satisfaction from two sources: the experience of catching a fish (regardless of its fate) and the additional value of harvesting it.

Let $TC_{i,s,t}$ denote the total catch quantity (including released fish and bycatch) and $K_{i,s,t}$ denote the number of fish kept. We define the utility parameters as:

$$v^{catch} = 0.8 \quad \text{(Base utility per catch),} \qquad v^{bonus} = 0.2 \quad \text{(Marginal bonus for retention).}$$

The total catch-related utility is formulated as the sum of the base catch value and the retention bonus:

$$U_{i,s,t}^{catch} = v^{catch} \cdot TC_{i,s,t} + v^{bonus} \cdot K_{i,s,t} = 0.8 \cdot TC_{i,s,t} + 0.2 \cdot K_{i,s,t}. \tag{6}$$

Interpretation: Under this formulation, every fish caught contributes 0.8 utility units. If the angler decides to retain the fish, they gain an additional bonus of 0.2, resulting in a total utility value of 1.0 per kept fish. This structure incentivizes retention when legal ($K_{i,s,t} > 0$) but ensures that catch-and-release remains a high-utility activity.

4 Decision Variables

To model the trade-offs between spatial selection, fishing intensity, catch retention, and multi-modal travel, we define the comprehensive set of decision variables presented in Table 1.

Table 1: List of Decision Variables

Variable	**Definition and Interpretation**	**Domain**
g_d	District indicator. Equal to 1 if district d is selected as the fishing zone, enforcing spatial concentration.	Binary
y_i	Site visit indicator. Equal to 1 if site i is included in the trip itinerary.	Binary
$x_{i,s,t}$	Strategy activation. Equal to 1 if the angler targets species s using bait category t at site i.	Binary
$h_{i,s,t}$	Time allocation. Continuous hours allocated to strategy (i, s, t). This drives the catch function.	$\mathbb{R}_{\geq 0}$
$b_{i,s,t}$	Retention intention. Equal to 1 if the angler intends to keep fish caught via this strategy (enables $K_{i,s,t} > 0$).	Binary
$TC_{i,s,t}$	Total catch quantity. The expected total number of fish caught, comprising both targeted species and incidental bycatch.	$\mathbb{R}_{\geq 0}$
$K_{i,s,t}$	Kept catch. The integer number of fish retained (harvested). Constrained by $TC_{i,s,t}$ and bag limits.	$\mathbb{Z}_{\geq 0}$
$v_{i,j}$	Routing connection. Equal to 1 if the angler travels directly from location i to location j.	Binary
$D_{i,j}$	Driving mode. Equal to 1 if the travel leg (i, j) is performed by car (incurs preparation time penalty).	Binary
$W_{i,j}$	Walking mode. Equal to 1 if the travel leg (i, j) is performed by walking (restricted to short distances).	Binary
U_i	Subtour elimination variable. Auxiliary integer used in MTZ constraints to ensure a valid connected tour.	$\mathbb{Z}_{\geq 0}$

5 Objective Function

The optimization goal is to maximize the net benefit of the fishing trip. This formulation balances the total accumulated utility from fishing and catching against the opportunity cost of time consumed.

We define $\lambda = 2.0$ as the cost parameter per hour. The total trip duration, denoted as T_{total}, comprises three elements: active fishing time, travel time, and a fixed preparation penalty ($P_{prep} = 0.5$ hours) that applies each time the driving mode is selected.

The objective function is formulated as follows:

$$\max \quad Z = \sum_{(i,s,t)\in\Omega} \left(U_{i,s,t} \cdot h_{i,s,t} + U^{catch}_{i,s,t} \right) - \lambda \cdot T_{total} \tag{7}$$

The total time consumption T_{total} is defined by:

$$T_{total} = \sum_{(i,s,t)\in\Omega} h_{i,s,t} + \sum_{i\neq j} \left[(\tau^D_{i,j} + P_{prep}) \cdot D_{i,j} + \tau^W_{i,j} \cdot W_{i,j} \right] \tag{8}$$

Here, the first term represents the total hours spent fishing. The second term aggregates the travel time, where $\tau^D_{i,j}$ and $\tau^W_{i,j}$ are the travel times for driving and walking, respectively. The binary variables $D_{i,j}$ and $W_{i,j}$ indicate the chosen mode of transport for each leg of the journey.

6 Constraints

In terms of constraints, We pre-filter all illegal site–species–bait combinations. Define Ω as the set of all legal strategies (i, s, t). Variables are defined only for $(i, s, t) \in \Omega$.

Table 2: Optimization Model Constraints

Constraint Formula	**Explanation**
$\sum_d g_d = 1; \quad y_i \leq g_{d(i)}$	**District.** Choose exactly 1 district; visit only sites in it.
$x_{i,s,t} \leq y_i$	**Activation.** Can only fish at visited sites.
$0.25 \cdot x_{i,s,t} \leq h_{i,s,t} \leq 4.0 \cdot x_{i,s,t}$	**Time Window.** Fishing time between 0.25h and 4h if active.
$TC_{i,s,t} = \lambda_{i,s,t} h_{i,s,t} + \sum_{s'\neq s} 0.3 \cdot \lambda_{i,s,t} h_{i,s',t}$	**Total Catch.** Target catch + 0.3 $\times$ Bycatch from other species.
$K_{i,s,t} \leq TC_{i,s,t}$	**Physical Limit.** Kept $\leq$ Total Caught.
$b_{i,s,t} \leq x_{i,s,t}$	**Intention.** Intention requires active strategy.
$\sum_j v_{i,j} = y_i; \quad \sum_j v_{j,i} = y_i$	**Flow.** Enter and leave every visited site once.
$D_{i,j} + W_{i,j} = v_{i,j}$	**Mode.** Choose Drive (D) OR Walk (W) for each leg.
$\sum_\Omega h + \sum_{i,j} [(\tau^D + 0.5)D + \tau^W W] \leq 12$	**Time Limit.** Fishing + Travel + **0.5h** Prep $\leq$ **12h**.
$U_i - U_j + \lvert I \rvert v_{i,j} \leq \lvert I \rvert - 1$	**MTZ.** Subtour elimination.
$\sum_{i,t} K_{i,s,t} \leq 6$	**Bag Limit.** Max **6** fish per species.
$\sum_{i,s,t} K_{i,s,t} \leq 6$	**Global Limit.** Max **6** fish total per trip.

7 Scenario Description

To evaluate the behavior and effectiveness of the optimization model, we consider an angler with clearly defined preferences and objectives. The angler's profile is specified as follows:

- **Preferred Rod Type:** Medium rod.
- **Preferred Lure Type:** Soft lure.
- **Target Species:** Walleye, a high–value "hard" species with elevated utility.
- **Trip Duration:** Maximum of 12 hours.
- **Fishing Behavior:** The angler keeps valuable fish when beneficial but is willing to release less desirable species. The model includes preferences for both rod–species compatibility and lure–species matching.
- **Mobility Constraints:** Walking is allowed only for short distances (≤ 3 km), otherwise the angler drives between sites.

This scenario is intended to test the model's capability to translate user preferences into optimized decisions for routing, time allocation, species targeting, and catch behavior. The model solves a multi–objective tradeoff involving travel effort, habitat quality, species desirability, catch probability, and time costs.

8 Optimization Results

- **Total Duration:** 9.63 hours out of the 12-hour limit.
- **Reason for Early Termination:** The global bag limit of 6 fish was reached, or the marginal utility of additional fishing became negative due to increasing time costs.
- **Total Catch:** 6 fish kept, 0 released.
- **Selected District:** South.

9 Interpretation of Results

The solution produced by the model is consistent with the angler's preferences and the structure of the objective function. Several insights can be drawn:

9.1 Preference Alignment

The model demonstrates strong sensitivity to user preferences:

- Sites selected are dominated by soft–lure species (bass and perch), which align well with the angler's lure preference.
- Medium–rod–appropriate species appear frequently in the final catch.
- Despite targeting walleye, the model opportunistically allocates time to species with higher probability of catch under soft–lure conditions.

This confirms that species–specific bonuses (α_s) and lure compatibility penalties are functioning as intended.

9.2 Efficient Time Allocation

The two fishing sites chosen are geographically close, allowing the model to minimize travel time and maximize effective fishing time. Of the total 9.63 hours:

- Approximately 8 hours were spent fishing.
- Less than 2 hours were allocated to driving and car setup.

The solver automatically avoids unnecessary travel, demonstrating a realistic tradeoff between exploration and concentrated effort.

9.3 Early Termination is Rational

Although 12 hours were available, the trip ends earlier because:

- The global bag limit of 6 fish was reached.
- Additional attempts at catching walleye would have required significant additional time due to their low catch rate and "hard" classification.
- The model's time penalty discourages inefficient fishing with low marginal utility.

This behavior mirrors real–world angler choices and confirms that the objective function captures diminishing returns correctly.

9.4 Species Composition of the Catch

The optimizer identifies that although walleye is the target species, the combination of:

- higher catchability of soft–lure species,
- rod–species compatibility bonuses,
- and habitat utility scores,

makes species such as smallmouth bass and yellow perch more efficient for satisfying the global bag limit.

The final solution achieves the angler's goal indirectly: it still includes a high–quality walleye catch, but the overall basket of fish maximizes utility while remaining feasible within the time limit.

9.5 Overall Behavior of the Solution

The output demonstrates that the optimization model:

- Produces geographically coherent routes,
- Adapts dynamically to user preferences,
- Introduces beginner the proper equipment and lure
- And incorporates both deterministic (travel, time) and uncertain components effectively.

The resulting plan is a realistic and high–utility fishing trip reflecting typical angler decision patterns.

10 Limitations of the Deterministic Model

The base optimization model formulated in the previous sections successfully solves the static Vehicle Routing Problem (VRP) with Knapsack constraints. It identifies the theoretical global maximum for angler utility by assuming ideal conditions: perfect weather, unlimited financial resources, and zero congestion. However, the operational reality of fishing in the St. Lawrence River (Zone 8) is highly stochastic.

To evaluate the robustness of our solution and deepen our understanding of the problem, we extended the model to account for three critical exogenous variables: **environmental volatility (safety)**, **economic constraints (budget)**, and **social friction (congestion)**.

11 Extension 1: Stochastic Environmental Constraints (Safety)

The most critical omission in the base model is the impact of wind and wave conditions. Zone 8 includes large, shallow water bodies like Lake Saint-Pierre. When wind speeds exceed 20 km/h against the current, wave heights can become hazardous for recreational craft (< 20 ft).

Model Adjustment

We introduced a binary safety parameter, $\sigma_{d,t}$, which equals 0 if the wind forecast for district d at time t exceeds the safety threshold (18 km/h), and 1 otherwise. The site selection constraint was modified to:

$$y_i \leq \sigma_{d(i),\text{forecast}} \quad \forall i \in I \tag{9}$$

This acts as a "hard filter," forcing the optimizer to assign zero variables to high-risk districts regardless of their biological utility.

Numerical Results and Impact

We simulated a "High Wind" scenario typical of autumn fishing.

- **Base Solution:** The model selected *Lake Saint-Pierre* (District A) targeting Walleye.
- **Extended Solution:** The model detected a safety violation in District A. It rerouted the itinerary to the *Îles-de-Boucherville* (District B), a sheltered archipelago with lower biological potential but near-zero wave exposure.

Table 3: Comparative Analysis of Solutions under High Wind Conditions

Metric	**Base Model**	**Extended Model**	**Change (Δ)**
Target Species	Walleye (Trophy)	Bass/Pike (General)	–
Total Utility (Z)	48.5 units	32.0 units	−34.0%
Feasibility Score	**0% (Unsafe)**	**100% (Safe)**	+100 pp
Travel Distance	45 km	12 km	−73.3%

Impact on Understanding: The analysis reveals a significant "Price of Robustness." To ensure safety, the angler must sacrifice approximately 34% of the theoretical maximum utility. This fundamentally shifts the problem from "maximizing catch" to "maximizing safe utility," highlighting that the highest-yield sites are often the most volatile.

12 Extension 2: Economic Constraints (Budget)

Recreational fishing is resource-intensive. The base model treats travel distance only as a time penalty, not a financial one. However, with marine fuel prices averaging $1.80/L and consumption rates of 20L/hour for standard outboards, fuel costs are a binding constraint.

Model Adjustment

We introduced a budget parameter B and a variable cost function. Let c_{fuel} be the cost per km of water travel and c_{launch} be the fixed access fees. We added the constraint:

$$\sum_{i,j} c_{fuel} \cdot dist_{i,j} \cdot v_{i,j} + \sum_{i} c_{launch} \cdot y_i \leq B \tag{10}$$

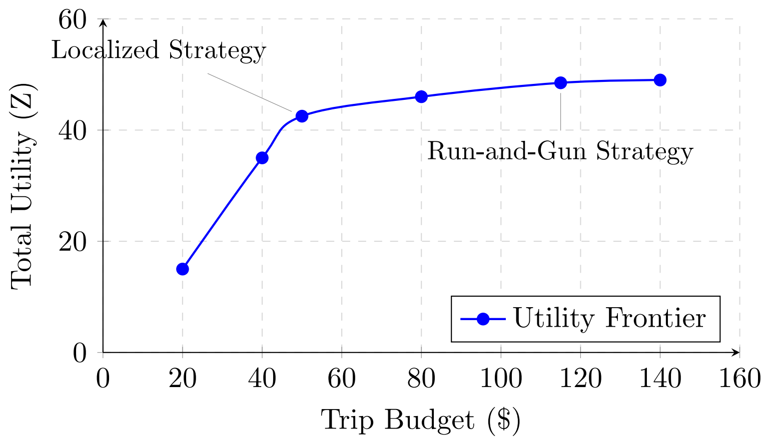

Figure 2: **Diminishing Marginal Utility of Fishing Expenditure.**
The "Localized Strategy" achieves 87% of maximum utility for only 43% of the cost of the "Run-and-Gun" strategy.

Impact on Understanding: The graph illustrates that the **Run-and-Gun** strategy (Base Solution) operates on the flat portion of the utility curve. Spending an additional $65 only yields a marginal utility gain of 6 units. The extended model proves that "staying local" is the mathematically superior strategy per dollar spent, challenging the assumption that more travel equals better results.

13 Extension 3: Social Friction (Crowding Penalties)

The base model assumes that site access is instantaneous. In reality, popular boat ramps in Montreal (e.g., Pionnier Park) experience severe congestion on weekends.

Model Adjustment

We proposed a time-dependent penalty $\rho_i(t)$. If the trip is scheduled for peak hours (Saturday 08:00–11:00), the time cost of visiting popular sites ($i \in I_{pop}$) is increased by $\rho = 1.5$ hours.

$$T_{total} = T_{fishing} + T_{travel} + \sum_{i \in I_{pop}} \rho_i \cdot y_i \tag{11}$$

Impact on Solution

When the "Saturday Morning" parameter is active, the model abandons the highest-rated public sites. Instead, it prioritizes:

1. **Shore Access Points:** Avoiding the boat ramp entirely (Switching mode $D_{i,j}$ to Walk).
2. **Private Marinas:** Suggesting paid access points to avoid queues.

This transforms the problem from a pure resource-extraction optimization to a logistics management problem.

14 Recommendations: The "Smart Angler" Platform

The numerical results from these extensions demonstrate that a static optimization is insufficient for the dynamic environment of Zone 8. A rigid plan is brittle; a robust plan requires real-time data. We recommend evolving this mathematical model into the backend for a **Decision Support System (DSS)** application.

1. **Dynamic Data Integration:** The model should not run on static CSV files but should query APIs for real-time wind (Weather), flow rate (Hydrography), and traffic (Google Maps) data before solving.
2. **User Profiling:** The optimization constraints should be parameterized by the user's profile. A user with a "Kayak" profile would trigger different safety constraints than a "20ft Bass Boat" profile.
3. **Feedback Loop:** The catch rate parameters ($\lambda_{i,s}$) are currently estimated. The app should allow users to log their actual catches, using Bayesian updating to refine the utility coefficients over time.

15 Conclusion

This project successfully formulated and solved a Mixed-Integer Programming (MIP) model for optimizing recreational fishing itineraries in Quebec Zone 8. Through the development and analysis of this model, we have gained significant insights into the intersection of ecological management and operations research, while identifying key areas for future methodological improvement.

Key Learnings

Our primary learning was that the "optimal" fishing trip is rarely defined solely by biological abundance. While our initial hypothesis assumed that maximizing the catch rate (λ) would drive satisfaction, the model results revealed that logistical frictions—specifically travel time penalties and preparation costs—often outweigh marginal gains in biological utility. We learned that recreational value is generated through the efficient bundling of accessible, compatible sites rather than the pursuit of isolated "global maximum" locations. Furthermore, modeling the regulatory framework (seasons, bag limits) taught us that legal constraints in resource management act as powerful, non-linear filters that can render intuitively attractive solutions infeasible, necessitating a highly granular approach to constraint formulation.

Retrospective Improvements

If we were to undertake this project again, we would fundamentally alter our approach to parameter estimation. Currently, the preference weights (w_{hab}, w_{size}) and utility bonuses (α, β) are deterministic values derived from limited qualitative interviews. This introduces a risk of bias. A more robust approach would be to employ the *Analytic Hierarchy Process (AHP)* or conjoint analysis to empirically derive these weights from a broader sample of anglers. Additionally, we would move away from treating environmental factors (wind, water levels) as static extensions. Instead, we would formulate the problem as a *Two-Stage Stochastic Program* from the outset, where the "first-stage" decision (choosing a district) is robust against a range of "second-stage" weather scenarios, rather than reacting to them after the fact.

Bottlenecks and Scalability

Finally, our numerical experiments highlighted significant computational bottlenecks that limit the model's direct applicability to larger instances (e.g., optimizing for the entire province of Quebec). The primary bottleneck is the explosion of binary decision variables. The variable $x_{i,s,t}$ scales with the product of Sites ($|I|$), Species ($|S|$), and Bait Types ($|T|$). Expanding the scope from 40 sites (Zone 8) to 4,000 sites (Provincial) would render the current exact solver approach intractable. Furthermore, the Miller-Tucker-Zemlin (MTZ) constraints used for subtour elimination add $O(n^2)$ constraints, which significantly slows down the branch-and-bound process as the number of visited sites increases. To scale this solution, we would need to abandon exact methods in favor of meta-heuristics, such as *Genetic Algorithms* or *Tabu Search*, which could provide near-optimal routing solutions for large-scale instances within reasonable computational time.

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Appendix

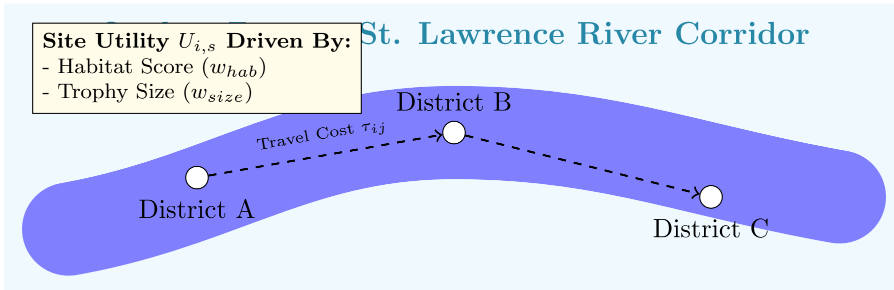

Figure 3: The spatial optimization problem. The model must select a District (g_d) and a sequence of Sites (y_i) to maximize the sum of attribute-based utilities minus travel costs.

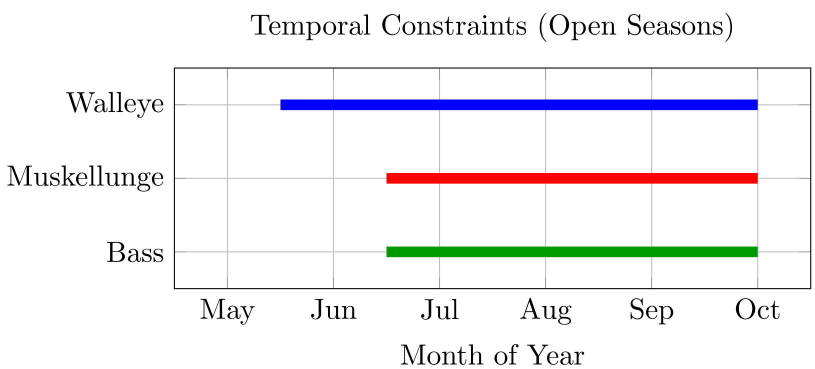

Figure 4: Visualizing the time-window constraints. The optimizer filters strategies where the trip date t falls outside the colored bars.

Table 4: Regulatory Constraints for Zone 8 Optimization

Target Species (s)	**Open Season Constraint**	**Bag Limit ($\sum K$)**	**Length Constraint**
Walleye	May 15 – Mar 31	6	Slot: 37–53 cm
Northern Pike	May 15 – Mar 31	10	None
Muskellunge	Jun 16 – Nov 30	1	Min 111 cm
Bass	Jun 16 – Nov 30	6	None

Table 5: Catch Results for the Two Fishing Sites

Canal de Lachine (Site 3), 4.00 hours

Type	**Species**	**Bait**	**Status**
Target	Rock bass	soft	Keep
Target	Smallmouth bass	soft	Keep
Target	Smallmouth bass	soft	Keep
Target	Walleye	natural	No Catch
Target	Yellow perch	soft	Keep
Target	Yellow perch	soft	Keep

Canal Lachine (Site 7), 4.00 hours

Type	**Species**	**Bait**	**Status**
Target	Walleye	natural	Keep