



Bass Database
Conceptual Database Design

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A Introduction

A.1 Purpose of the Conceptual Database Design

The purpose of this document is to build a conceptual model of the data requirements of the enterprise. The Business requirements overview is included here.

B Business Requirements Overview

Tracking all species of salt and freshwater bass is a difficult task to memorize for anybody. Fish and wildlife services and anglers will be able to access important information about these fish.

B.1 Assumptions/Constraints

WNE Anglers have decided to focus on the most important information of all species of bass. This includes the names of the fish (common name, scientific name, abbreviated name), the description of the fish (length, weight, primary color, secondary color), and their breeding tendencies (where and when in different bodies of water.) They also want to be able to enter this data easily and get their native locations, world record weight/length, and regulations.

B.2 System Scope

The scope of this project is to develop a database for Fish and Wildlife services as well as common anglers to be able to access data about these fish whenever it's needed.

C Logical Data Model

For this project, a relational database will be developed to meet Fish and Wildlife services and Anglers needs for all freshwater and saltwater bass species.

1 Conceptual Design

1.1 Entities

Entities needed for this database are videos, actors and roles.

1.1.1 Table of Entities

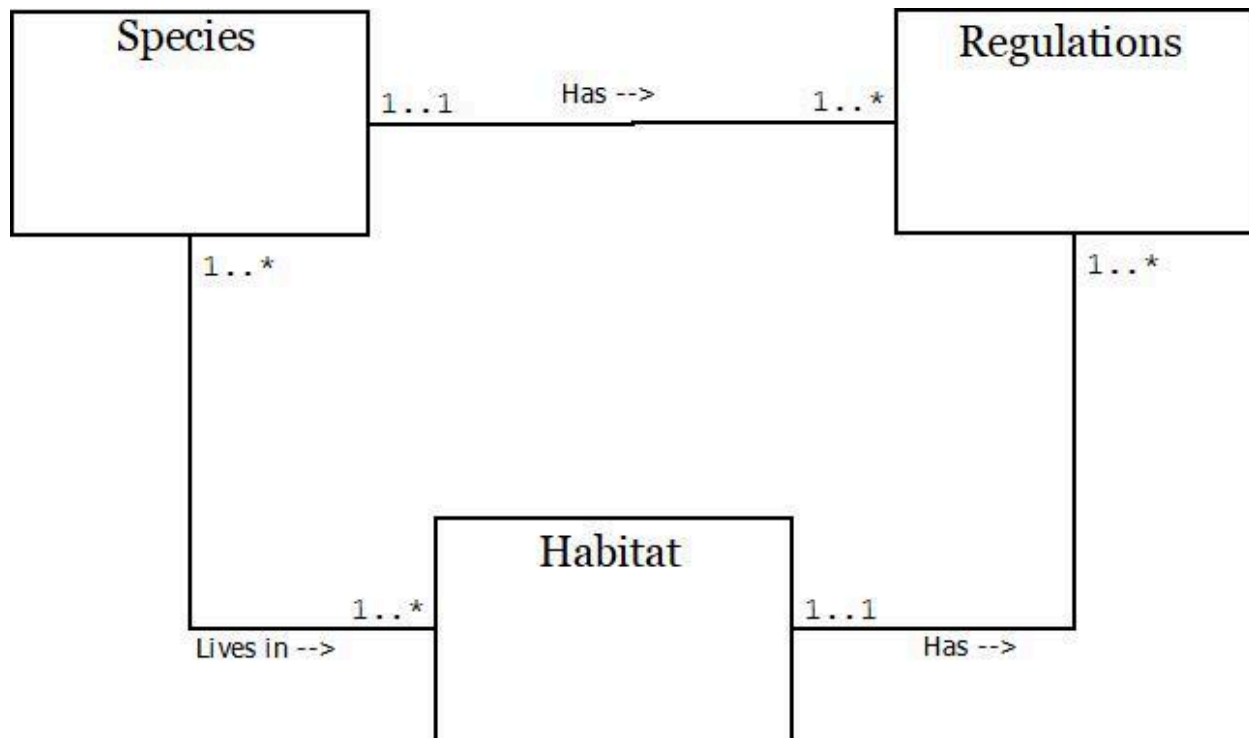
Entity Name	Description	Aliases	Occurrence
Species	Stores information about all species of bass		Each species represents a unique species of bass
Habitat	Information of habitats of each species		A specific habitat
Regulations	Information about fishing regulations for each habitat	Rules	Fishing regulations for a specific habitat in a particular region

1.2 Relationships

1.2.1 Table of Relationships

Entity Name	Multiplicity	Relationship	Multiplicity	Entity Name
Species	1..*	Lives in	1..*	Habitat
	1..1	Has	1..*	Regulations
Habitat	1..1	Has	1..*	Regulations

1.2.2 Preliminary ER Diagram



1.3 Attributes

1.3.1 Table of Attributes

Entity Name	Attributes	Description	Data Type & Length	Nulls	Multi-Valued
Species	SpeciesID	Unique Id for Species	5 variable char	No	No
	CommonName	Species common name	30 variable char	No	No
	ScientificName	Species scientific name	30 variable char	No	No
	AbbreviatedName	Species abbreviated name	30 variable char	Yes	Yes
	AveLength	Species average length	int	No	No
	AveWeight	Species average weight	int	No	No
	AveLife	Average length of life	Years	No	No
	PrimColor	Species primary color	15 variable char	No	Yes
	SecondColor	Species secondary color	15 variable char	Yes	No
	PrimaryForage	Main forage	30 variable char	No	No
	SpawnStartDate	Date species start spawning	Date	No	No
	SpawnEndDate	Date species end spawning	Date	No	No
	MigrationPattern	How/where they migrate	30 variable char	No	No
	TerritorialBehavior	Level Of Aggression	15 variable char	No	no
Habitat	HabitatID	Unique Id for habitat	5 variable char	No	No
	WaterType	Type of Water	15 variable char	no	no
	HabitatType	Type of habitat	30 variable char	No	No
	Temp	Water temp	int	No	Yes
	Depth	Water depth	int	No	Yes
	Vegetation	Vegetation	30 variable char	No	Yes
Regulations	ConservationID	Unique Id for Conservation	5 variable char	no	no
	State	State Name Abbreviation	5 variable char	no	no
	FishingSeason	Season of the year	6 variable char	no	yes
	CatchLimit	Number Of Fish Allowed to keep	int	yes	no
	MaxLength	Max length allowed to keep	int	yes	no
	MinLength	Min length allowed to keep	int	yes	no

1.4 Attribute Domains

The following attributes will have the indicated domains:

1.4.1 Table of Attribute Domains

Attribute	Domain	Format
SpeciesID	5-value character string	Two lowercase letters followed by three digits
HabitatID	5-value character string	Two lowercase letters followed by three digits
State	2-value character string	Two lowercase letters followed by three digits
ConservationID	5-value character string	Two lowercase letters followed by three digits
AveLife	2-value character string	YY
AveWeight	Int	Pounds
AveLength	Int	Inches
SpawnStartDate	Date	MM/DD/YYYY
SpawnEndDate	Date	MM/DD/YYYY
Temp	Int	Temperature in fahrenheit
Depth	Int	Depth in feet

CatchLimit	Int	NN
MaxLength	Int	FF/II
MinLength	Int	FF/II

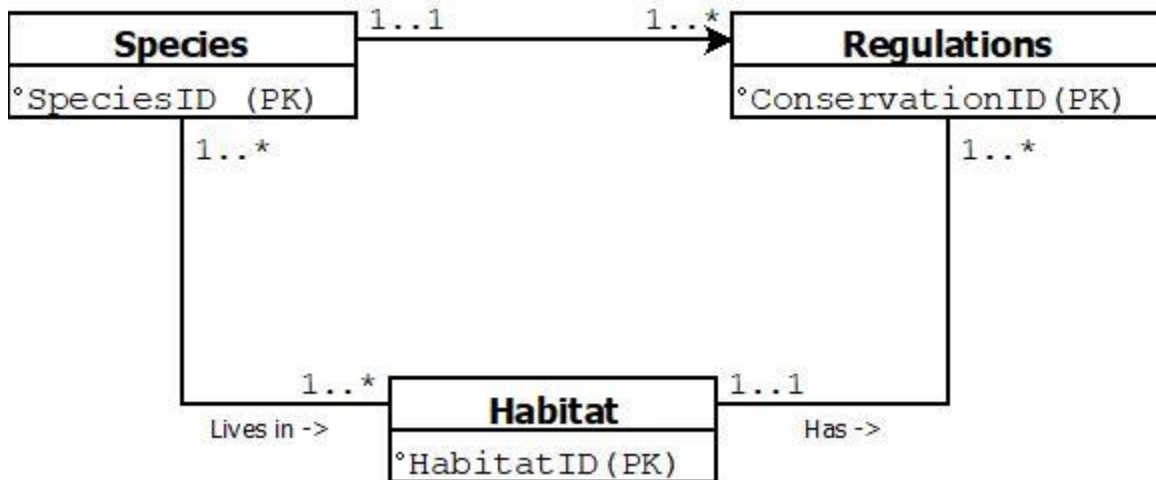
1.5 Key Attributes

1.5.1 Table of Key Attributes

The following keys will be used for each entity:

Entity	Candidate Keys	Primary Key	Alternate Key(s)
Species	SpeciesID; ScientificName	SpeciesID;	ScientificName
Habitat	HabitatID;	HabitatID;	
Regulations	RegulationsID;	RegulationsID;	

1.5.2 Updated ER Diagram – Primary Keys Added



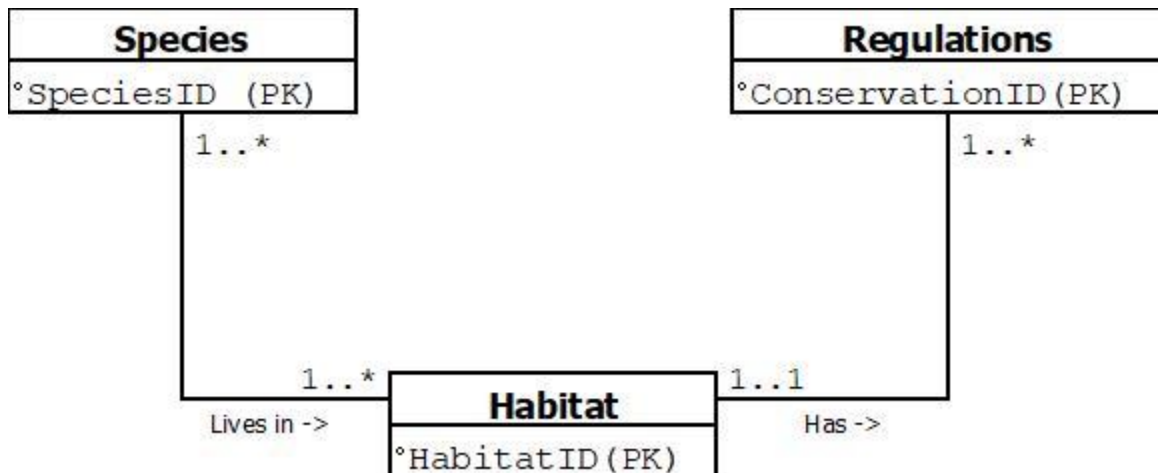
1.6 Enhanced Modeling

Enhanced modeling was deemed not to be necessary.

1.7 Check for Model Redundancy

1. There are no one-to-one relationships, so no mergers need to be applied.
2. There are two paths that lead from Species to Regulations; one directly and the other through Habitat. Remove the direct relationship between Species and Regulations since that information can be obtained through the Habitat entity.
3. Considering time dimension does not nullify the previous conclusion to remove the direct relationship.

1.7.1 Updated ER Diagram – Redundant Relationship Removed

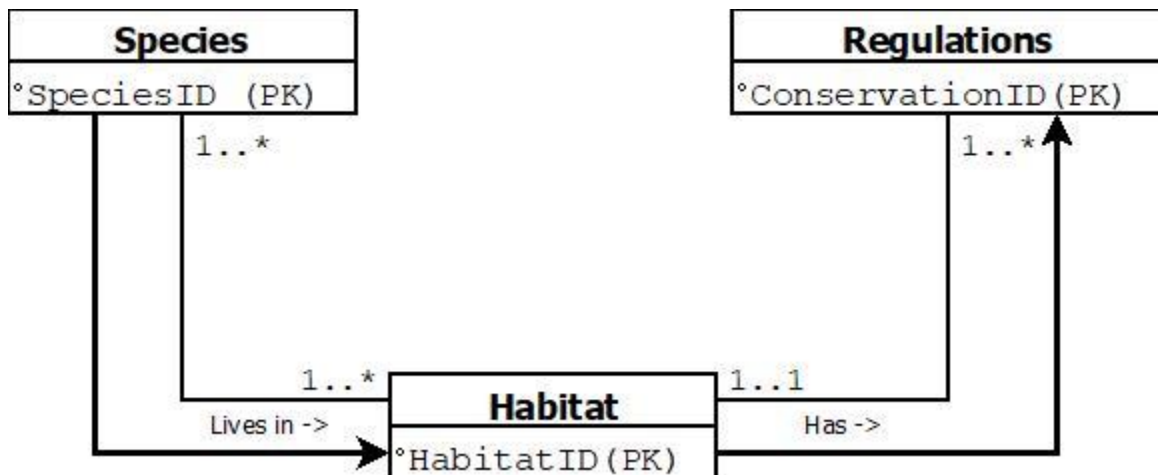


1.8 Validate Model Against User Transactions

1.8.1 Display Habitat and Regulations by Species

The steps needed to accomplish this are as follows:

1. The user selects a Species. This data comes from the Species relation.
2. The system then displays the species, the habitats involved and its regulations. This data comes from the Species, Habitats, and Regulations relations.

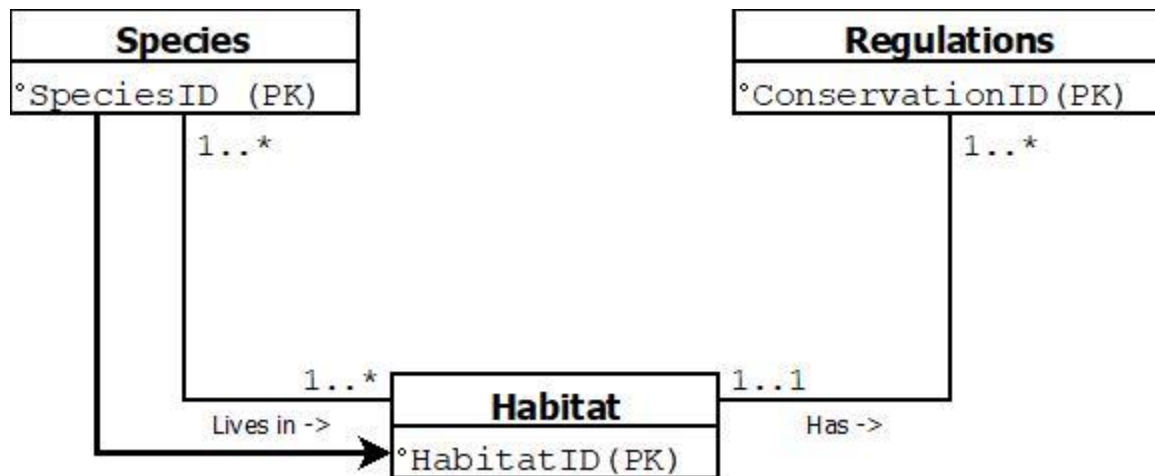


1.8.2 Display Habitat by Species

The steps needed to accomplish this are as follows:

1. The user selects a species. This data comes from the species relation.
2. The system then displays the habitat, the species in which they appear. This data comes from the species and habitat relations.

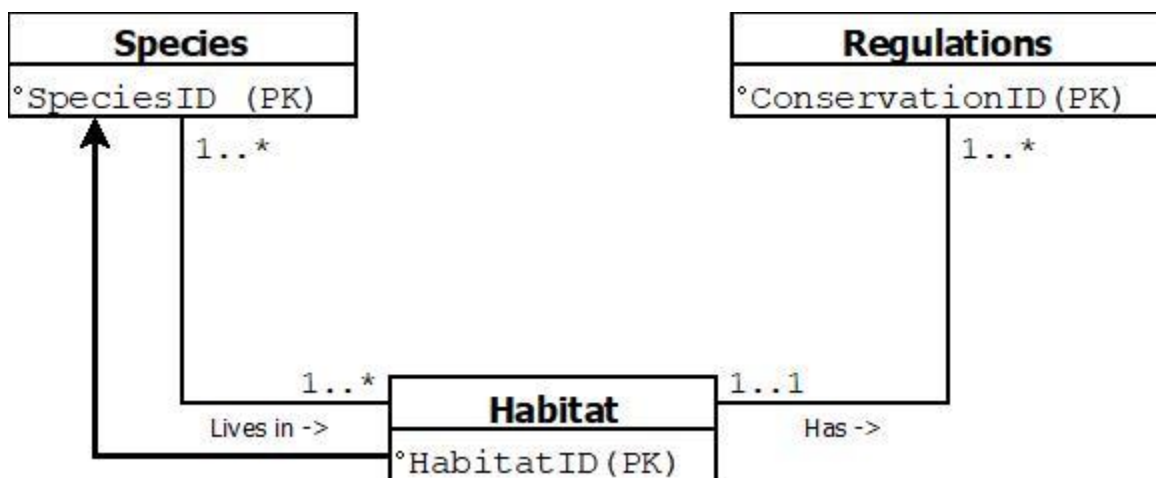
This structure will allow a user to display the habitat and their roles for a species.



1.8.3 Display Species by Habitat

The steps needed to accomplish this are as follows:

1. The user enters a habitat. This data involves the habitat relation.
2. The user enters a habitat involved and displays species. This data involves the species and habitat relations.



1.9 Review Conceptual Data Model with User

Here is the current schema for the Bass Database to be used for review:

Species(SpeciesID, CommonName, ScientificName, AbbreviatedName, AveLength, AveWeight, AveLife, PrimColor, SecondColor, PrimaryForage, SpawnStartDate, SpawnEndDate, MigrationPattern, TerritorialBehavior)

Habitat(HabitatID, WaterType, HabitatType, Temp, Depth, Vegetation)

Regulations(ConservationID, State, FishingSeason, CatchLimit, MaxLength, MinLength)