**ENVIRONMENTAL IMPACTS:**

env\_impact = f"""

Disease/Parasite/Toxicity: The species pose some hazard or threat to the health of native species (e.g., it magnifies toxin levels; is poisonous; is a pathogen, parasite, or a vector of either); the species has introduced a novel or rare disease or parasite to another organism in the area that was unafflicted with said disease or parasite before its introduction, including moving a native parasite outside of its typical range; toxicity includes both envenomation and poisoning. The species pose some hazard or threat to human health (e.g., it magnifies toxin levels, is poisonous, a virus, bacteria, parasite, or a vector of one).

Predation/Herbivory: species consumes or is consumed by another species.

it alter predator-prey relationships.

Food Web: species changes second order or higher nutrient/feeding cascades.

Competition: The species out-compete native species for available resources (e.g., habitat, food, nutrients, light). species shares a niche with another species where introduced, such that they compete for resources (such as food and habitat).

Genetic: Has it affected any native populations genetically (e.g., through hybridization, selective pressure, introgression). Species hybridizes with another organism as a result of its introduction, with the resulting offspring viability being irrelevant.

Water Quality: species creates measurable changes in water chemistry/quality/parameters as compared to pre-introduction. negatively affect water quality (e.g., increased turbidity or clarity, altered nutrient, oxygen, or other chemical levels/cycles).

Habitat Alteration: introduction of the species modifies the environment to which it was introduced, such as zebra mussels that attached to surfaces, changing the substrate of a waterbody.

alter physical components of the ecosystem in some way (e.g., facilitated erosion/siltation, altered hydrology, altered macrophyte/phytoplankton communities, physical or chemical changes to substrate)?

"""

query = f"""

What are the documented categorical ecological impacts of invasive ```{species}``` in invaded regions? Categorize and report impact as “Disease/Parasite/Toxicity”, “Predation/Herbivory”, “Food Web”, “Competition”, “Genetic”, “Water Quality”, or “Habitat Alteration” using ```{env\_impact}```as guidance. If there are multiple impacts report them as a text string separated by commas.”

"""

study\_type = f"""

Experimental: a study/reference with a claim that was supported experimentally, i.e. at least one variable in the study was manipulated.

Observational: a study/reference that with a claim that was founded observing something, i.e. nothing in the study or report was a result of manipulating any variables.

Anecdotal: a study/reference with a claim that is unfounded with direct research, but supported by theory or correlation, therefore anecdotal.

"""

query = f"""

How was the impact documented? Using ```{study\_type}``` as guidance, possible values are: “Experimental”, “Observational”, and “Anecdotal.”

"""

study\_location = f"""

Field: The study/impact occurred in the field.

Laboratory: The study/impact occurred in the laboratory.

N/A: Study/impact was not in a lab or field setting.

"""

query = f"""

Where did the documented impact occur? Using ```{study\_location}``` as guidance, possible values are: “Field”, “Laboratory”, and “N/A.”

"""

query = f"""

Where did the documented impact occur? Using ```{study\_location}``` as guidance, possible values are: “Field”, “Laboratory”, and “N/A.”

"""

query = f"""

Write one to three sentence descriptions of the df.loc[#][“impact”] of ```{species}``` on; this should include the scientific name of the species, as well as the geographic location of the impact (Country/state, waterbody). Descriptions must be fewer than 500 characters.

"""

query = f"""

Did this impact happen within the Great Lakes Basin? Possible responses are: “yes” or “no.”

"""

query = f"""

Where is the geographic location of the impact in the format “waterbody, State/province, Country” or “waterbody, Country.”  If the study takes place in lab/experimental or pond/environmental chamber, report location as “N/A.”

"""

query = f"""

If applicable, which species are associated with the impacted? If none, report “NA.”

"""

**SOCIO-ECONOMIC IMPACTS:**

soc\_eco\_impacts = f"""

Human Health: The species pose some hazard or threat to human health (e.g., it magnifies toxin levels, is poisonous, a virus, bacteria, parasite, or a vector of one) or species causes health impacts to humans either directly or indirectly, whether considered positive or negative.

Infrastructure: The species damage to infrastructure (such as water intakes, pipes, or any other industrial or recreational infrastructure)or the presence of the species has impacted structures/facilities from functioning or being created.

Water Quality: The species degrades water quality related to human use.

Other(eco): The speices harms markets or economic sectors (e.g., commercial fisheries, aquaculture, agriculture).

Recreation: The species inhibits recreational activities and/or associated tourism (e.g., through frequent water closures, equipment damage, decline of recreational species), changed the economic utility of the waterbody by affecting or changing the entertainment activities that did, or would have taken place in or near a waterbody before the introduction of the species

Other(aes): The species diminished the perceived aesthetic or natural value of the areas it inhabits.

"""

**BENEFICIAL IMPACTS**

benefit\_impacts = f"""

Other(biocontrol): The species acts as a biological control agent for aquatic weeds or other harmful nonindigenous organisms

Harvest: The species is commercially valuable (e.g., for fisheries, aquaculture, agriculture, bait, ornamental trade).

Recreation: The species is recreationally valuable (e.g., for sport or leisurely fishing, as a pet, or for any other personal activity).

Other(medsci): The species have some medicinal or research value (outside of research geared towards its control)

Water Quality: The species remove toxins or pollutants from the water or otherwise increase water quality.

Other(ecos): The species have a positive ecological impact outside of biological control (e.g., increases the growth or reproduction rates of other species, fills an important gap in the food web, supports the survival of a species which is threatened, endangered species, or commercially valuable)

"""

**LITERATURE REVIEW:**

query = f"""

What preferred habitat (including tolerances, thresholds, seasonal or diel migrations, etc.) does ```{species}``` inhabit? If information not available, report as “NA.”

"""

query = f"""

What environmental tolerances does ```{species}``` have (e.g. temperature, salinity, pH, etc)? If information not available, report as “NA.”

"""

query = f"""

What is the life history of ```{species}```? If information not available, report as “NA.”

"""

query = f"""

What is the management (biological, chemical, physical, etc.) and control methods are in place for ```{species}```? If information not available, report as “NA.”

"""

query = f"""

What physical characteristics are used to identy ```{species}```? If information not available, report as “NA.”

"""

query = f"""

What is the native range of ```{species}```? If information not available, report as “NA.”

"""

query = f"""

What are the nonindigenous occurrences of ```{species}```? If information not available, report as “NA.”

"""

query = f"""

What are the means of introduction of ```{species}```? If information not available, report as “NA.”

"""

query = f"""

What is the status of ```{species}``` in the Great Lakes? If information not available, report as “NA.”

"""

**RISK ASSESSMENT WATCHLIST A:**

**RISK ASSESSMENT WATCHLIST B:**