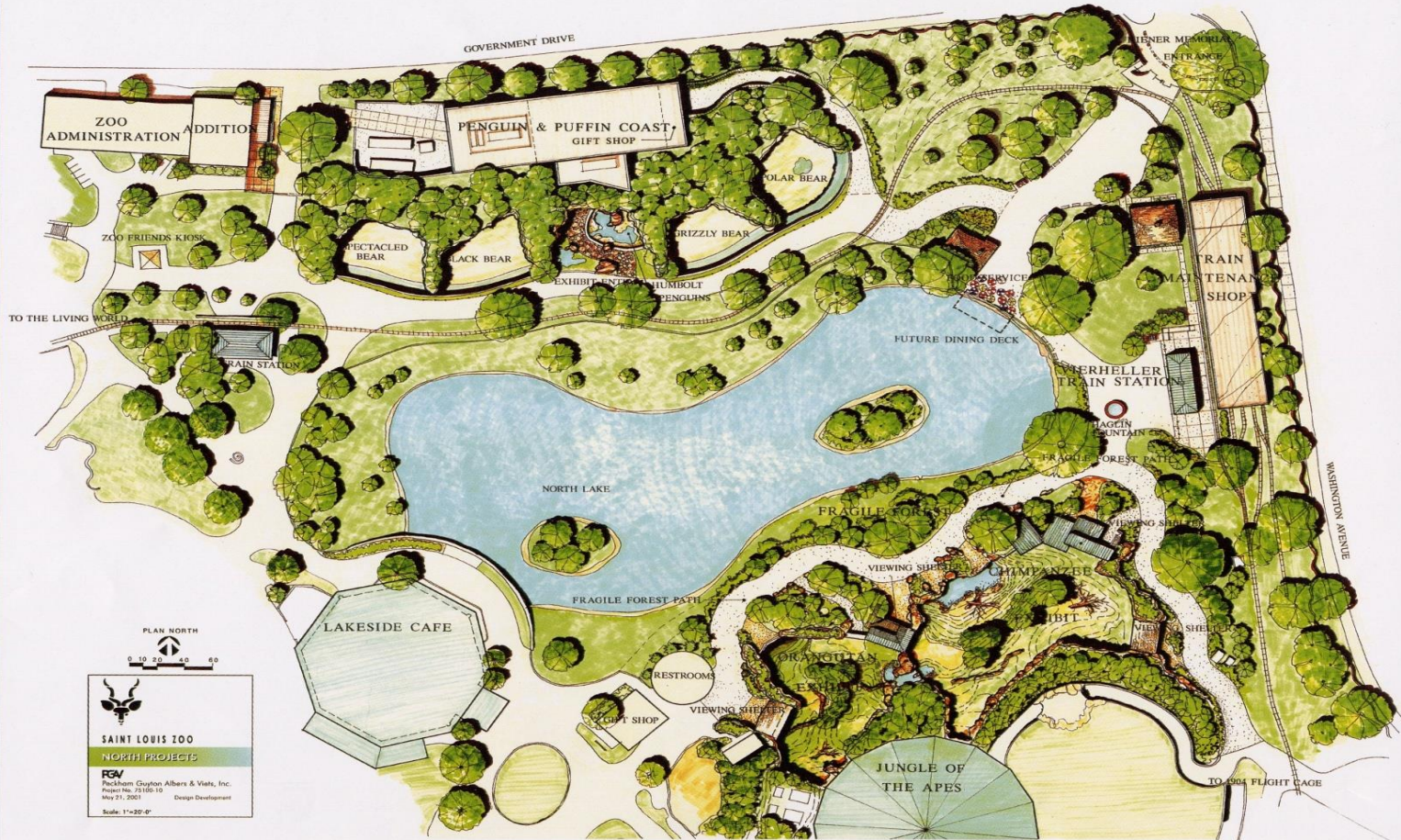


Saint Louis Zoo's Penguin and Puffin Coast:

Celebrating 12 Years as North America's First Walk-through Sub-Antarctic Penguin Habitat

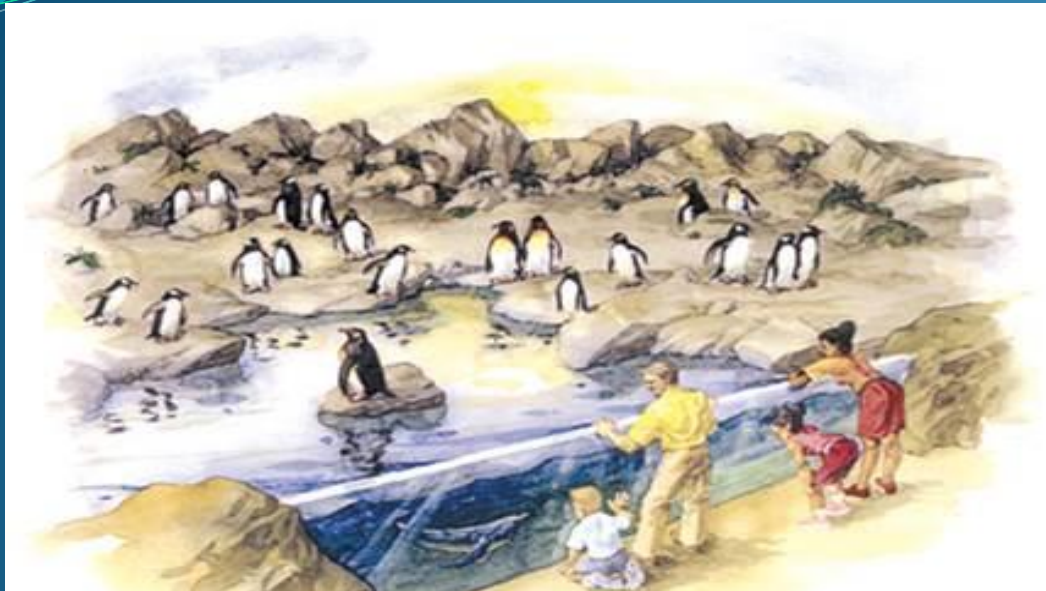


Saint Louis Zoo Penguin and Puffin Coast



The Penguin and Puffin Coast was conceived as part of the Zoo's 2002-2006 strategic plan.

Saint Louis Zoo Penguin and Puffin Coast

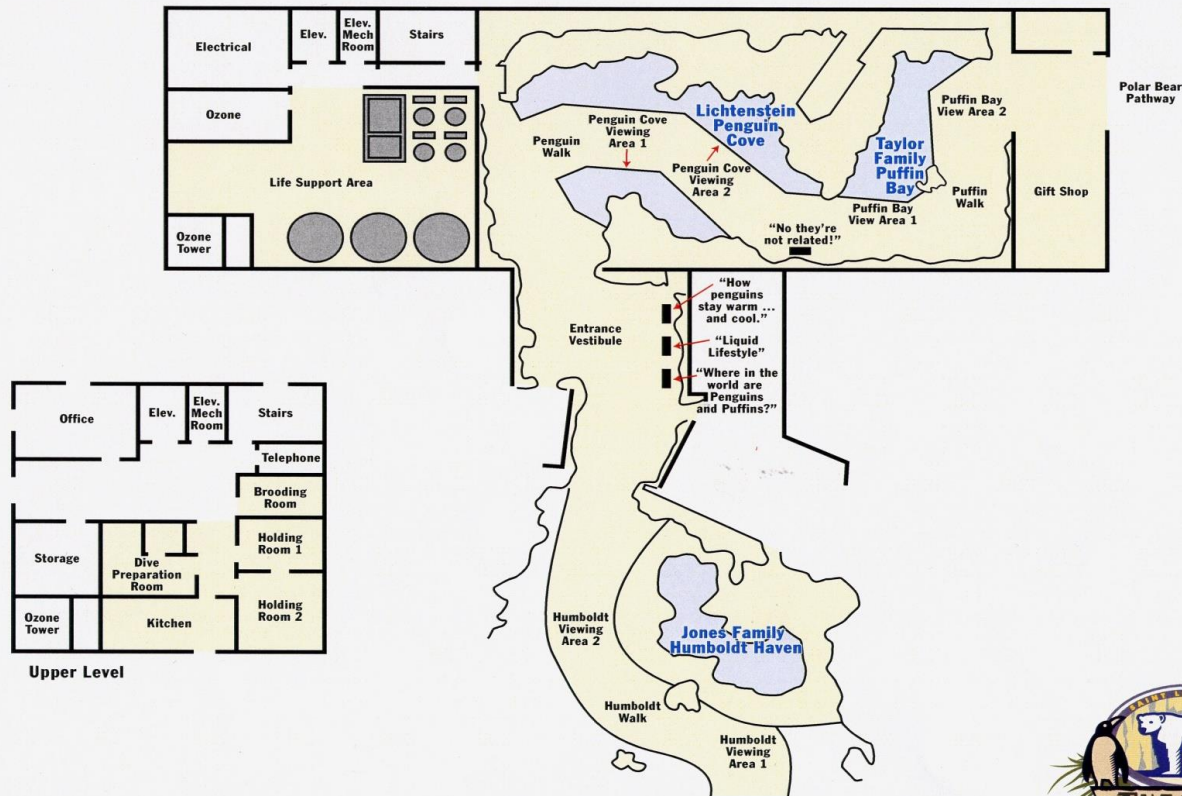


2002 – 2006 Strategic Plan Goals

- Maintain the zoo's taxonomic richness with the creation of a technologically modern facility capable of providing the husbandry requirements of penguins and puffins.
- Engage our guests in an innovative and experiential manner, to impress upon them the fascinating ways in which penguins and puffins have adapted to survive in extreme – and increasingly fragile marine environments.

Saint Louis Zoo Penguin and Puffin Coast

Penguin & Puffin Coast



Architect: Peckham, Guyton, Albers & Viets (PGAV)
Construction Cost: \$8.3 million

Saint Louis Penguin and Puffin Coast

Air Parameters

- OSHA, EPA and other regulatory agencies do not regulate mold spore or pollen concentrations for indoor environments or even suggest acceptable airborne concentration levels for humans.
- 2009 Penguin ACM: Fifteen air changes per hour have been recommended for laboratory animals (Lane-Petter, 1976)
- Fowler recommends 15 – 20 air exchanges
- 2009 Penguin ACM: Penguins as a group are highly susceptible to air-borne fungal infections. Airflow, fresh air exchanges, and filter capacity should be researched to provide the cleanest air possible.
- 2009 Penguin ACM: Aspergillus species spores range in size from 2.5 – 10 microns.
- 2009 Penguin ACM: 22 degrees – 52 degrees for sub-Antarctic species

Saint Louis Penguin and Puffin Coast

Air Parameters

- The Saint Louis Zoo utilizes gasket seal Hepamax filters certified to have a minimum efficiency of 99.97% on .03micron size particles.
- The entire volume of Air is filtered through hepa-filters at a rate of 12 x/hour
- The interior has a positive atmospheric pressure
- The temperature is maintained at 45 degrees F



Saint Louis Penguin and Puffin Coast Air Parameters

- Periodic samplings for mold and particulate occur using Zefon-Air-O-Cell cassettes drawn from a metered pump at 15 liters a minute for 120 minutes each. The samples are sent out to an independent testing laboratory.
- Evaluation of the mold and particulate is conducted by examining the air inside the exhibit areas and comparing each test period with the air at the same time outside the building.
- Aspergillus exhibit samples ranged from ND – 73 (spores/m³), while comparable outdoor readings ranged from ND – 147 (spores/m³).
- Total mold exhibit samples ranged from ND – 585 (spores/m³).



Saint Louis Penguin and Puffin Coast

Air Parameters

Mold Type	4/8		4/10		4/18		4/25		5/2		6/20	
Ascospores	110	37	402	146	ND	366	37	11383	ND	8887	37	15909
Aspergillus	ND	37	73	ND	ND	37	37	ND	ND	ND	ND	146
Basidiospores	ND	ND	ND	ND	73	183	ND	731	ND	768	ND	293
Cladosporium	146	ND	ND	ND	ND	1061	ND	219	ND	1024	ND	549
Peronospora	ND	ND	ND	ND	ND	37	ND	ND	ND	ND	ND	ND
Miscellaneous	37	73	110	37	37	73	ND	37	ND	146	37	146
Total	293	147	585	183	110	1757	74	12,370	ND	10,825	74	17043



Saint Louis Penguin and Puffin Coast

Water Parameters

- Filtration includes a combination of sand filters and ozone injection
- Water is maintained at a temperature of 45 degrees F (2009 ACM = 39 – 55F)



Saint Louis Zoo Penguin and Puffin Coast

Construction began
in September of 2001

Twenty-two month
construction Period



Zoo staff worked with model designers and
in-house rock fabricators on a daily basis

Saint Louis Zoo Penguin Cove

Physical Description

- The habitat space is 3,350 square feet
- The pool is 22,000 gallons at an average depth of 8 feet
- Water and air temperature is maintained at 45 degrees F
- Air is filtered through hepa-filters at a rate of 12 x/hour
- Digitally controlled lighting (metal halide, halogen, fluorescent) simulates latitude and longitude of South Georgia
- Building capacity of 500 guests



Saint Louis Zoo Penguin Cove

The habitat opened to the public on May 23, 2003



Saint Louis Zoo Penguin Cove



Saint Louis Penguin and Puffin Coast



Saint Louis Penguin and Puffin Coast



Saint Louis Zoo Penguin Cove Interpretation

Beverly Serrell's "Big Idea" concept applied to decisions about what would and would not be included in both the exhibit and interpretive program.

Penguin and Puffin Coast Big Idea

Penguins and Puffins have adapted in similar and fascinating ways to survive in extreme and increasingly fragile marine environments.

Colors in breeding season
Colors in breeding season



Tufted Puffin
Fratercula cirrhata



Colors in non-breeding season
Colors in non-breeding season



During breeding season, this puffin sports bright yellow tufts of feathers. These can help attract mates as they flash in the breeze. Like all puffins, tufteds are better swimmers than fliers. They dart after fast-moving fish and snatch them up in their large beaks.

Colors in breeding season
Colors in breeding season



Horned Puffin
Fratercula corniculata



Colors in non-breeding season
Colors in non-breeding season



This bird gets its name from the hornlike "knobs" above its eyes. These act as mating signals during breeding season. With puffins' comical faces and bright beaks and feet, it's no wonder people have called them "clowns of the sea."

Males in breeding season
Males in breeding season



King Eider
Somateria spectabilis



Males in non-breeding season
Males in non-breeding season



Don't let the bright head colors fool you: this is not a puffin but a duck. The male sports gaudy head feathers to attract the drab brown female, then loses the bright feathers after breeding season. Eiders dive in ocean waters for mussels, crabs, and fish.

No, They're Not Related!
Penguins and puffins may look and act alike, but they're not related to each other - they evolved from completely different ancestors.

So how did they wind up looking and acting the same?

They each evolved in cold, watery habitats and they each adopted the same kind of "jobs."

puffins hunt underwater for squid, shrimp-like krill, and fish

both puffins and penguins spend most of their lives at sea and come to land to breed

penguins hunt underwater for squid, shrimp-like krill, and fish

puffins usually mate for life

penguins usually mate for life

puffins live in the cold waters of the Northern Hemisphere

penguins live in the cold waters of the Southern Hemisphere

puffins nest in large colonies

penguins nest in large colonies

Over time, both puffins and penguins evolved nearly identical types of bodies even though they come from different ancestors.

Horned Puffin

Gentoo Penguin

colorful head and beak for breeding displays

salt glands for removing extra salt after drinking sea water

stiff, broad beak to hold fish

torpedo-shaped body to cut through water

black and white color for camouflage in ocean and concealing nest sites

flipper-like wings for swimming

dense, overlapping feathers for insulation and waterproofing

short legs at rear of body for steering underwater

wedged feet for swimming

dense bones for diving

puffins can fly

penguins can't fly

Saint Louis Zoo Penguin Cove

Unique Features

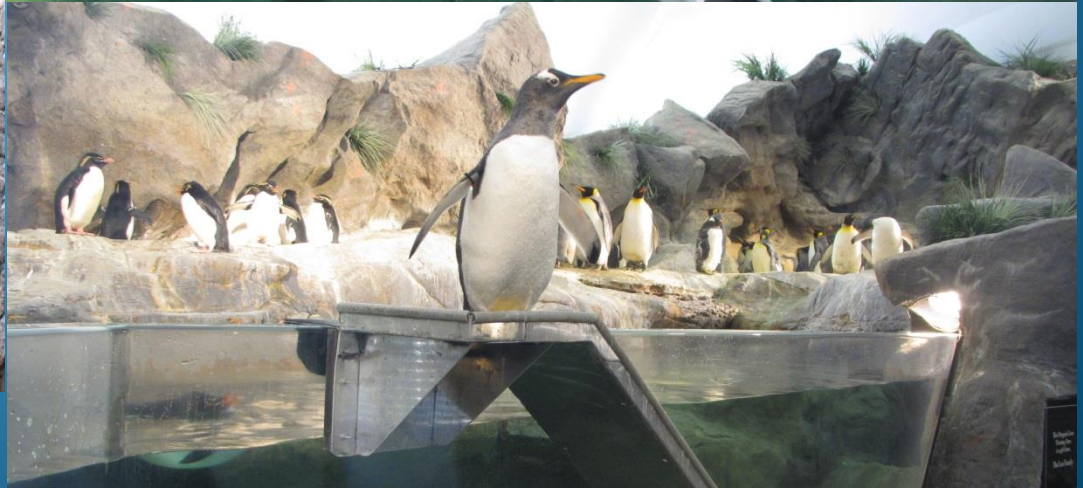
The habitat is staffed with security personnel during public hours



Saint Louis Zoo Penguin Cove

Unique Features

Penguin Ramp



Saint Louis Zoo Penguin Cove

Unique Features

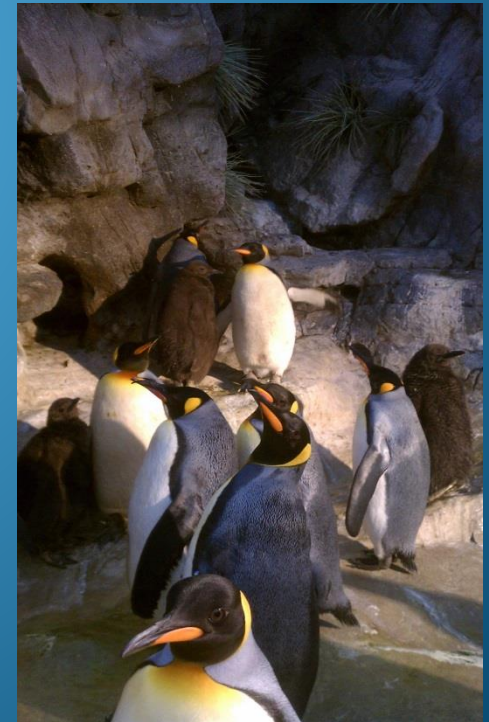
Public path net utilized during non-public hours



Saint Louis Zoo Penguin Cove

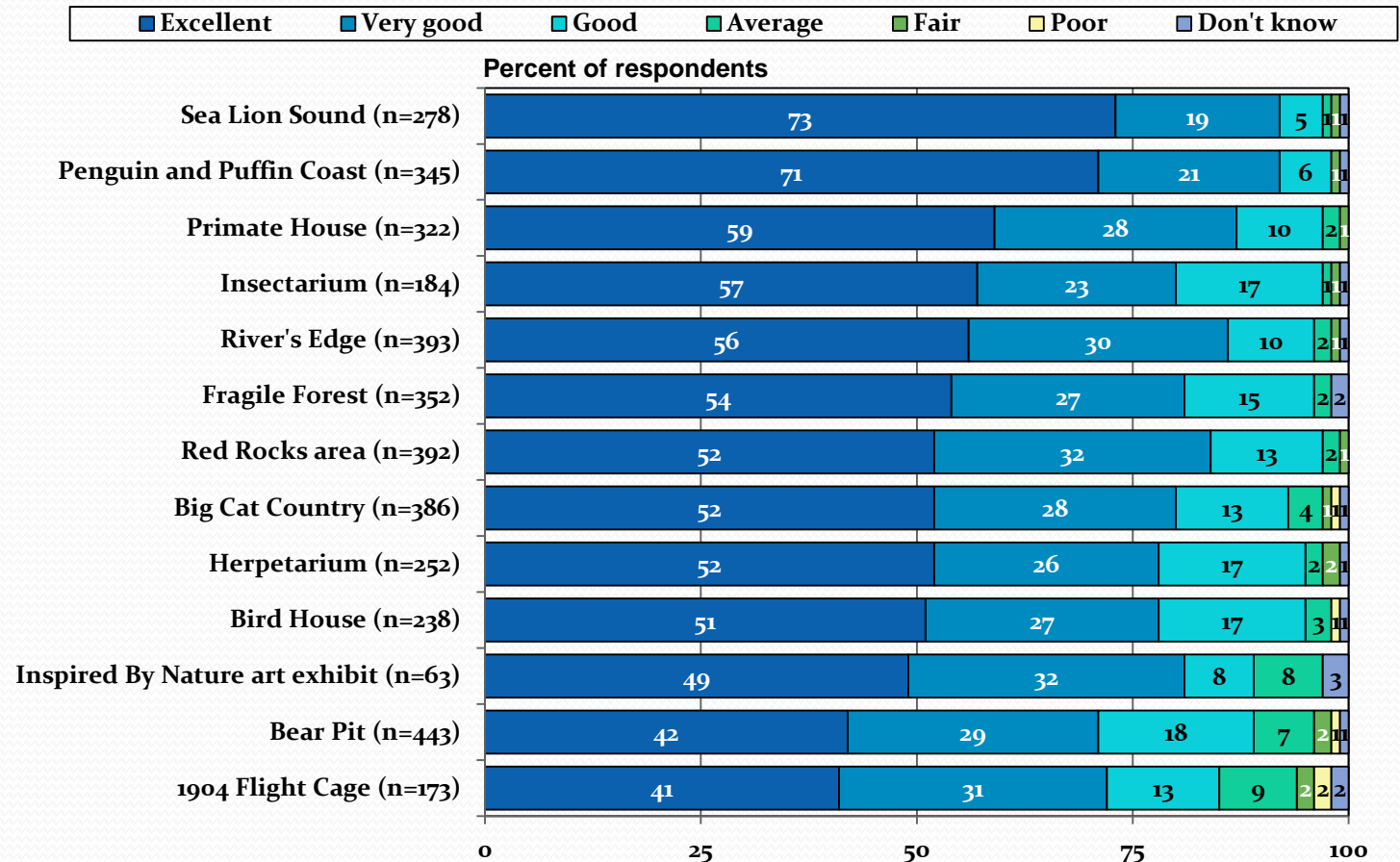
Unique Guest Features

- Guests enjoy staff interaction throughout the day
- The 45 degree temperature regulates guest “stay” times during peak season
- The Penguin and Puffin Coast is consistently rated as one of our most popular exhibits



Overall Rating Of Visit To Attractions

(Base=Respondents who visited each attraction/used service)



Q.8b3 How would you rate your overall visit to the ___ today? Would you say it was excellent, very good, good, average, fair, or poor?

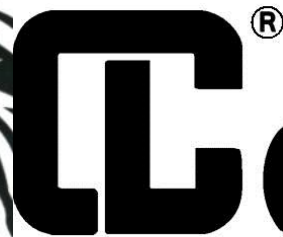
Saint Louis Zoo Penguin Cove



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