ENVIRONMENTAL FLOWS AND REUSE: FLUSHING FOR FISH

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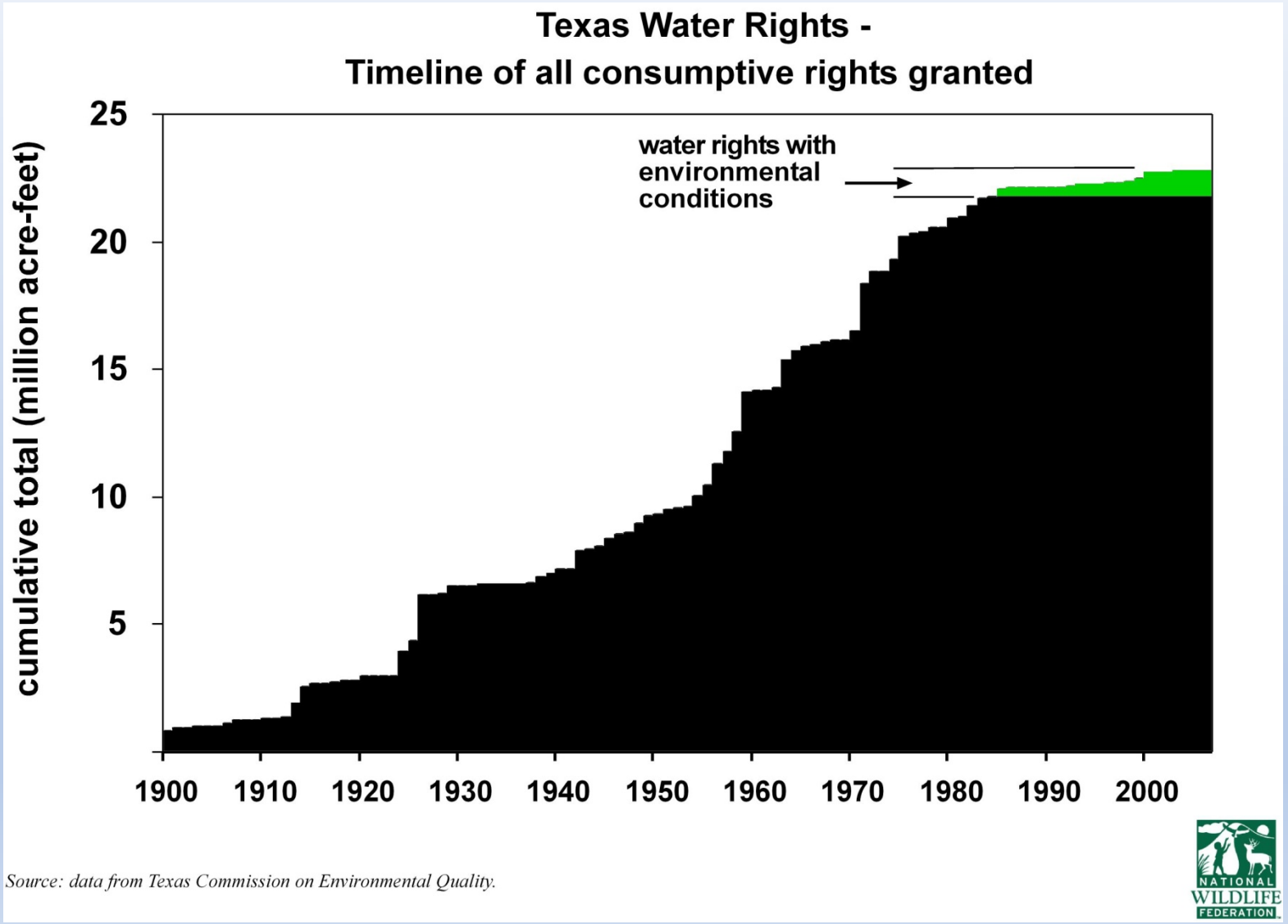
ENVIRONMENTAL FLOWS AND REUSE



WASTERWATER REUSE: + OR – FOR THE ENVIRONMENT?

- Can help avoid destructive new reservoir and extensive/expensive infrastructure projects (+)
- May reduce environmental flows (-)
- Answer is context specific (+/-)
  - Location and scale matter
  - Water source matters
  - Regulatory safeguards, such as flow protections, matter

RETURN FLOWS PROVIDE CRITICALLY IMPORTANT ENVIRONMENTAL FLOW PROTECTION

- Vast majority of flow in Texas streams and rivers has been permitted for use without environmental flow protections
- Good news is those rights aren't currently being fully used
- For many types of uses, water used isn't fully consumed

CONSERVATION *v.* EFFICIENCY

- Definition of water conservation in Texas Water Code includes reuse
- That definition also recognizes that efficiency is a separate concept from reuse
- Increased reuse doesn't necessarily mean increased water use efficiency
- Need to emphasize improved efficiency

REUSE ≠ EFFICIENCY

- **City A**
- 1,000 people
- 150,000 gpd diverted
- 150 gallons per person
- 60% return factor
- 60,000 gpd net flow loss

City B

1,000 people

150,000 gpd diverted

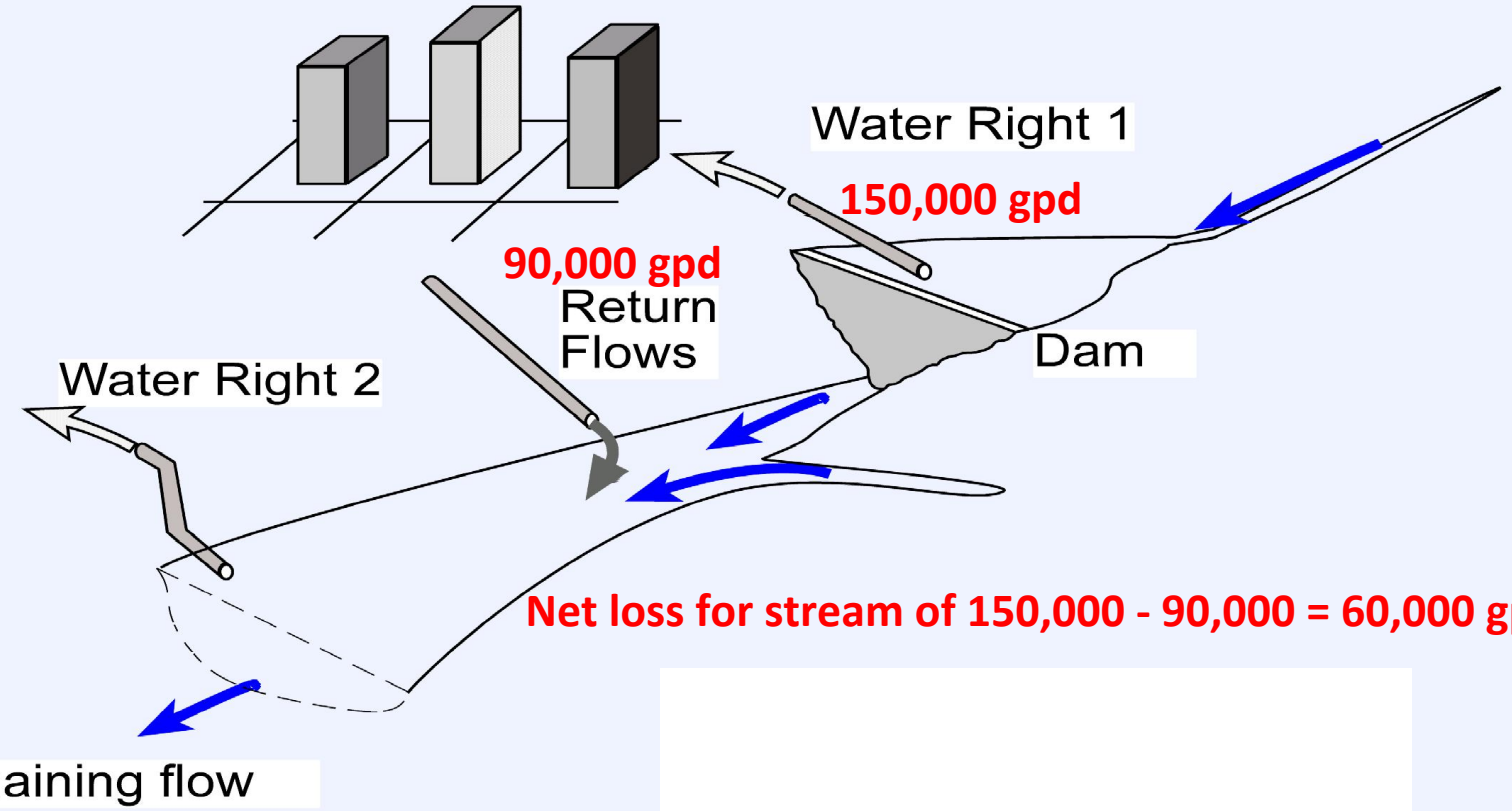
150 gallons per person

60% return factor

60,000 gpd net flow loss

ENVIRONMENTAL FLOWS AND REUSE

USUALLY PORTION OF WATER DIVERTED IS RETURNED TO THE STREAM



REUSE ≠ EFFICIENCY

- **City A**
- ~~1,000~~ (1,200) people
- ~~150,000 gpd diverted~~
- ~~150 gallons per person~~
- ~~60%~~ 56% return factor
- ~~60,000 gpd net flow loss~~
- Efficiency (30,000 gpd)
- 150,000 diverted
- 1,200 people = 125 gal/person
- 66,000 gpd net flow loss

City B

~~1,000~~ (1,200) people

~~150,000 gpd diverted~~

~~150 gallons per person~~

60% return factor

~~60,000 gpd net flow loss~~

Reuse (30,000 gpd)

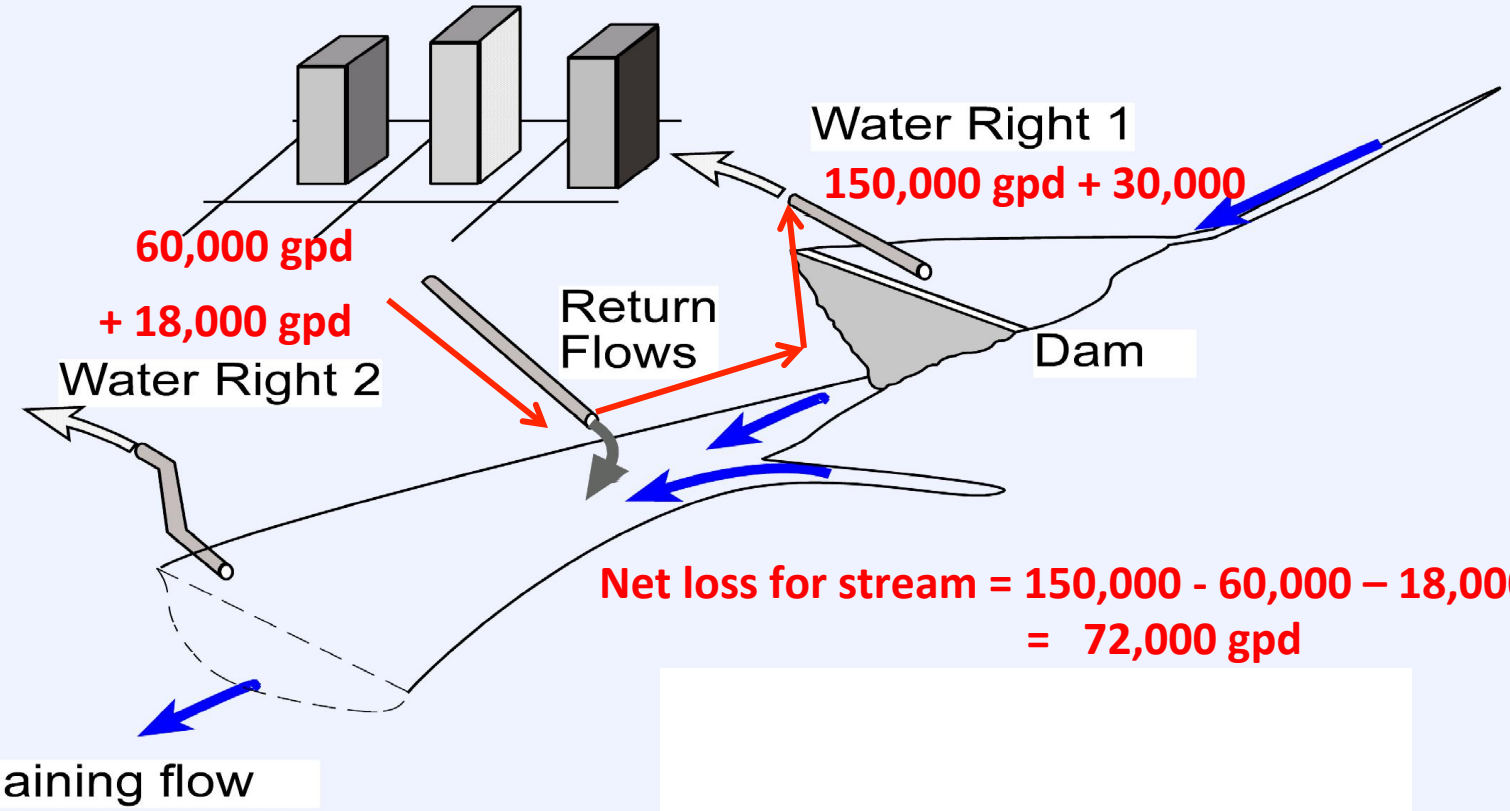
150,000 + 30,000 diverted

1,200 people = 150 gal/person

72,000 gpd net flow loss

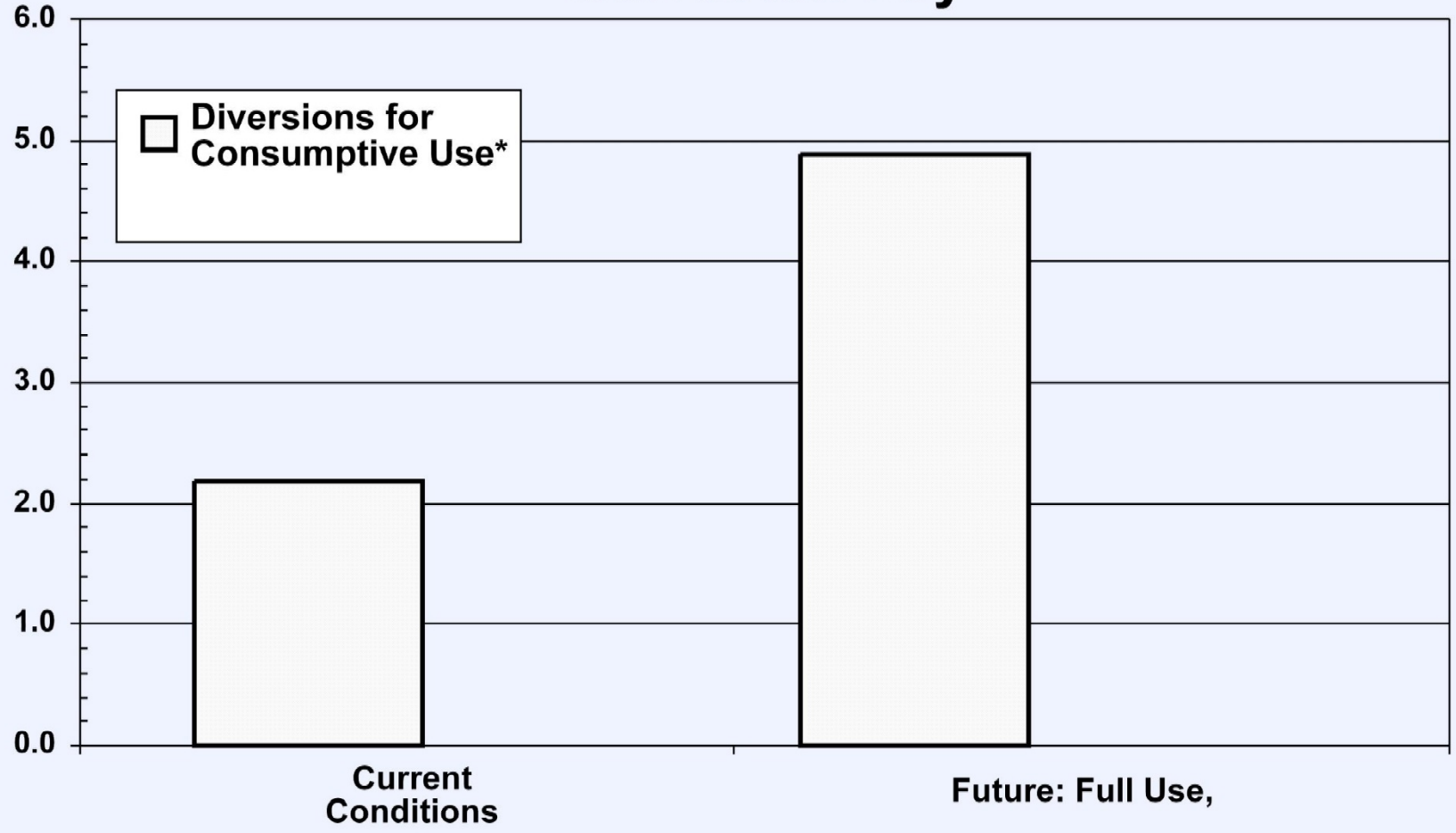
ENVIRONMENTAL FLOWS AND REUSE

USUALLY PORTION OF WATER DIVERTED IS RETURNED TO THE STREAM



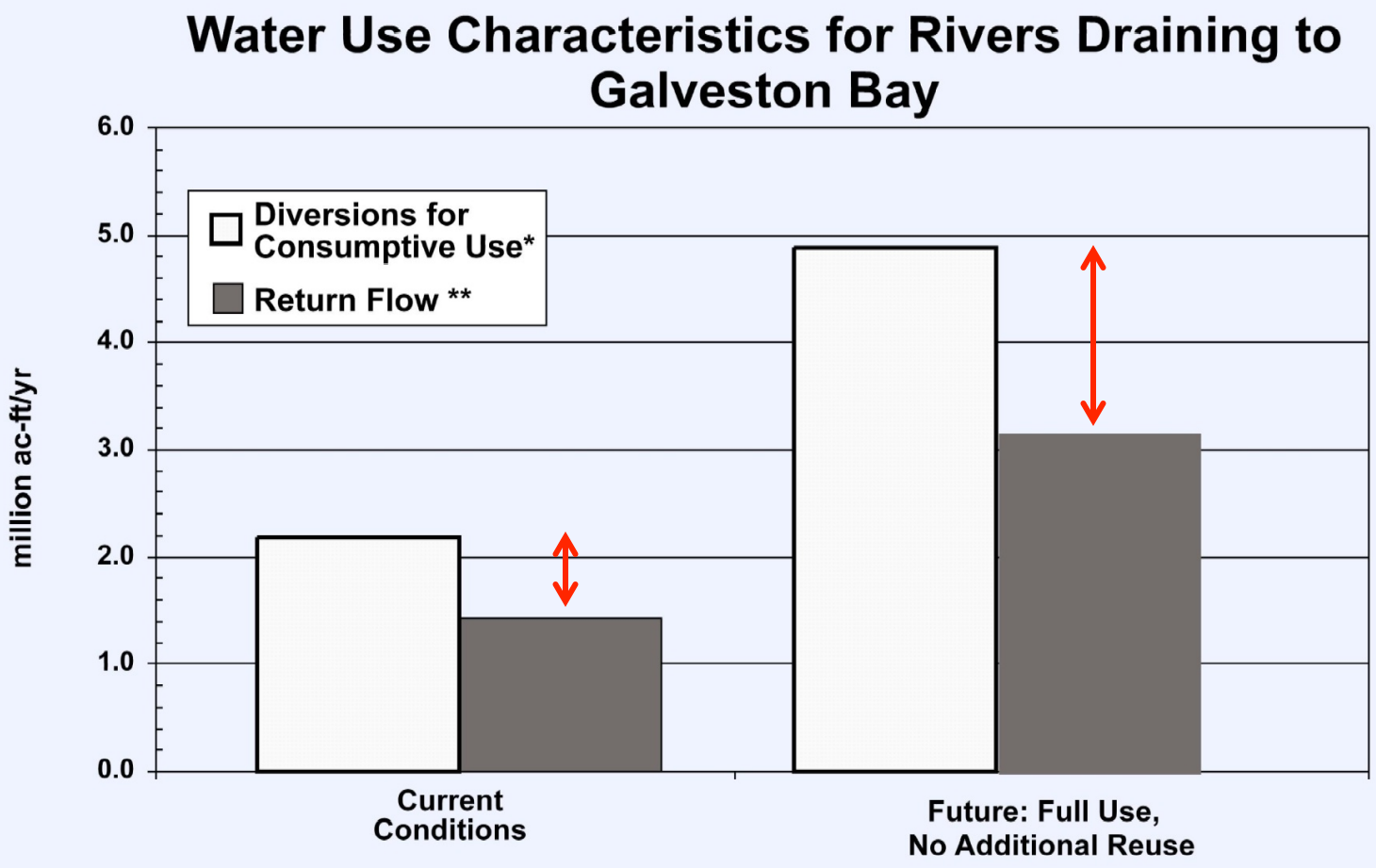
Net loss for stream = 150,000 - 60,000 – 18,000
= 72,000 gpd

Water Use Characteristics for Rivers Draining to Galveston Bay



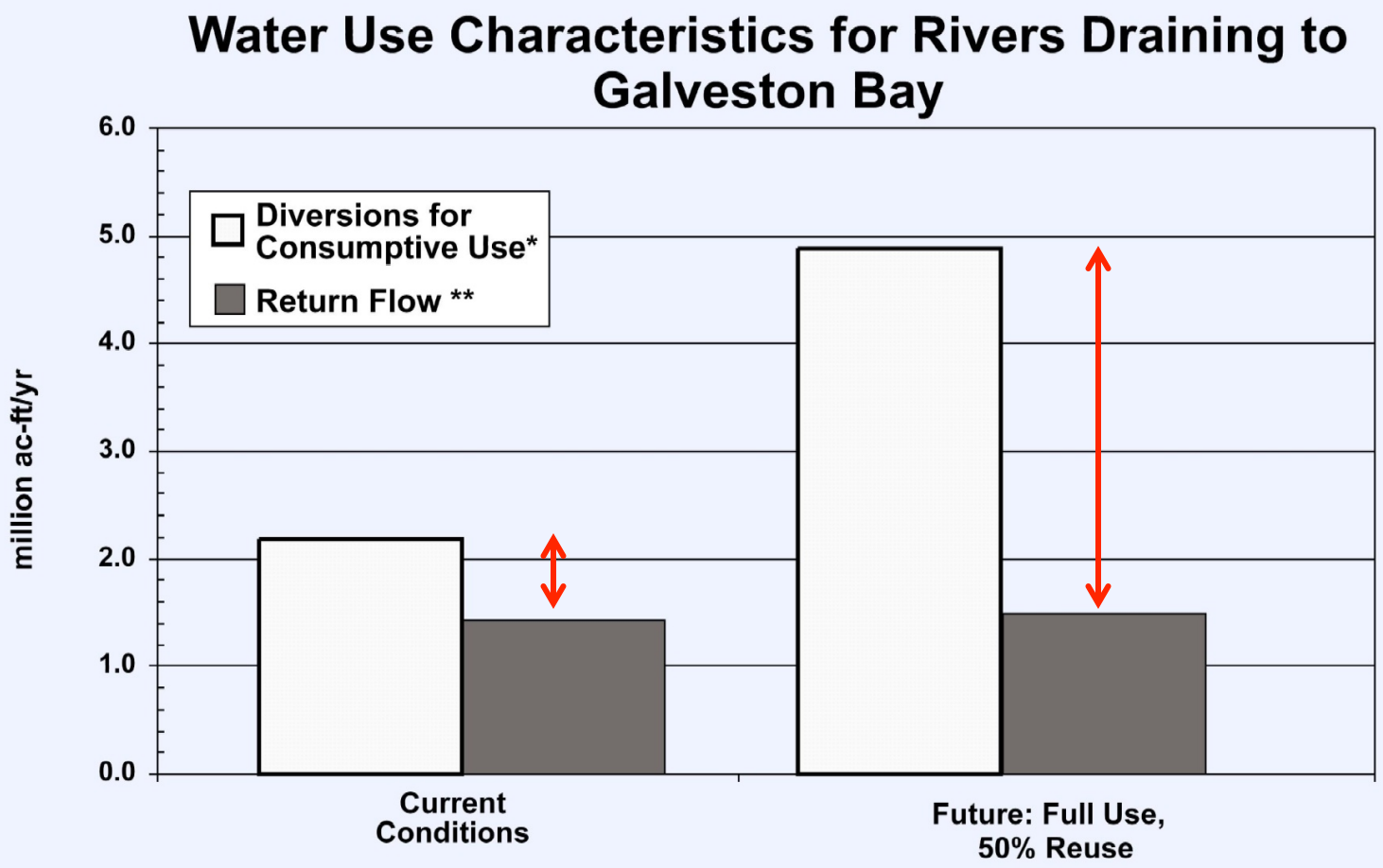
notes: * excludes hydropower and pass through cooling.

ENVIRONMENTAL FLOWS AND REUSE



notes: * excludes hydropower and pass through cooling.
**includes groundwater based return flows

ENVIRONMENTAL FLOWS AND REUSE



notes: * excludes hydropower and pass through cooling.
**includes groundwater based return flows

OPPORTUNITIES FOR WIN/WIN

- Great potential for striking a balance to add water supply and flow protections
  - City of Houston indirect reuse application
    - ≈ 50% of return flows committed for Galveston Bay inflows (also applicable to direct reuse)
    - Discharge locations close to bay minimize potential for subsequent diversion
  - Key challenges in ensuring return flow contributions to environmental flows
    - Potential for downstream diversion
    - Holes in the regulatory approach
    - Lack of planning to meet environmental needs