

# Project and Conservation Challenges in a Dryland Stream Environment



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Google

8653 ft

Imagery Dates: Nov 24, 2005 - Jan 12, 2006 32°46'17.65" N 115°53'05.65" W elev 242 ft

Eye alt 30241 ft







# The conclusion was partly due to the use of this definition:

- Streams, including creeks and rivers, are defined in Title 14 CCR 1.72 as “...*is a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life. This includes watercourses having a surface or subsurface flow that supports or has supported riparian vegetation.*”

# And partly due to the interpretation

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- That “...periodic and intermittent flow...” excluded ephemeral streams that only flow in direct response to precipitation.



# Several important points relative to the stream definition used:

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- Title 14, section 1.72 does not pertain to the Department's stream jurisdiction as embodied in the Fish and Game Code
- And thus is not the definition used in practice by the Department

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- References to “intermittent flow” in other Title 14 sections – such as section 720 – that do speak to the application of the F&GC have long been recognized by the courts to include streams with ephemeral flow.

# Fish & Game Code section 1602 states that:

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- “..an entity may not substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake...” unless certain conditions are met.

# F&G jurisdiction is not predicated on

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- The size of a stream,
- The morphology of the stream, or how well-defined its banks are,
- The cross-sectional area occupied by particular flow events,
- The time period between flow events
- Nor the constancy of water flow

# In practice, the Department defines a stream as

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- A body of water that flows perennially, intermittently, or ephemerally and that is defined by the area in which water currently flows, or has flowed over a given course during the historic hydrologic regime, and where the width of its course can reasonably be identified by physical or biological indicators.
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- The background of the slide features several faint, concentric circular ripples in shades of blue, resembling water droplets or ripples on a pond, positioned in the lower right and bottom center areas.

Moreover, the F&GC links stream protection with the presence of fish, wildlife, and their habitat...

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- This means “...all wild animals, birds, plants, fish, amphibians, invertebrates, reptiles, and related ecological communities, including the habitat upon which they depend for continued viability (FGC Division 5, Chapter 1, section 45, and Division 2, Chapter 1, section 711.2(a), respectively).

# Mapping considerations for the purpose of evaluating potential project-related impacts on episodic streams





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Two separate methods were used to define and delineate streams in the project area

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- The California Rapid Assessment Method (CRAM) (Collins *et al.* 2008).”
- The Rosgen stream classification system

The consultant acknowledged the limitations of both methods as stream delineation tools...

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- CRAM because as stated in Collins *et al.* (2008): *“There may be a limit to the applicability of [this method] in low order (i.e., headwater) streams in very arid environments that tend not to support species-rich plant communities with complex horizontal and vertical structure.”*

# And the Rosgen system because...

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- Discontinuous ephemeral channels – which dominate the landscape – cannot be classified as streams using the Rosgen scheme.



...nevertheless, the project consultant went on to conclude based on the application of CRAM that...

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- The discontinuous ephemeral channels on site “...are simply erosion features created by runoff...are not representative of riverine features supporting aquatic life or aquatic functions...and result from focused erosion that occurs on an infrequent basis during episodic storm events...” and as such these features do not represent streams relative to CRAM.

## And relative to Rosgen that...

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- “...the channels observed on site are actually representative of floodprone areas and that the banks observed with these channels are really the floodplain terraces, and that the bankfull stage and OHWM, if present as a result of water flow in most years, would be well contained within these observed terraces.”

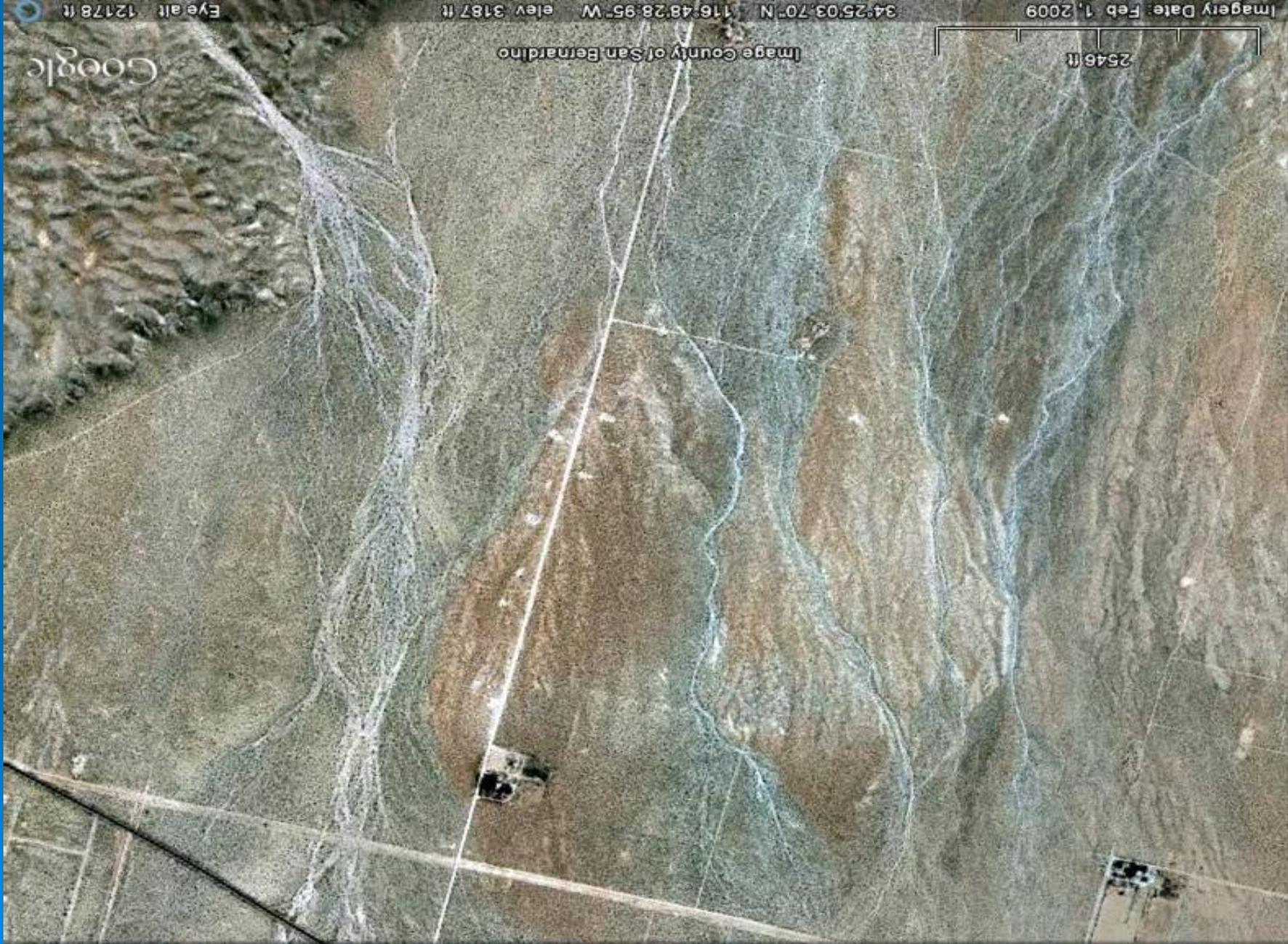


Image Date: Feb 1, 2009

34.2503, 70° N, 116.4828, 95° W, elev 3187 ft

2546 ft

Image County of San Bernardino

Eye alt 12178 ft

Google

# Conceptual model of stream processes and forms

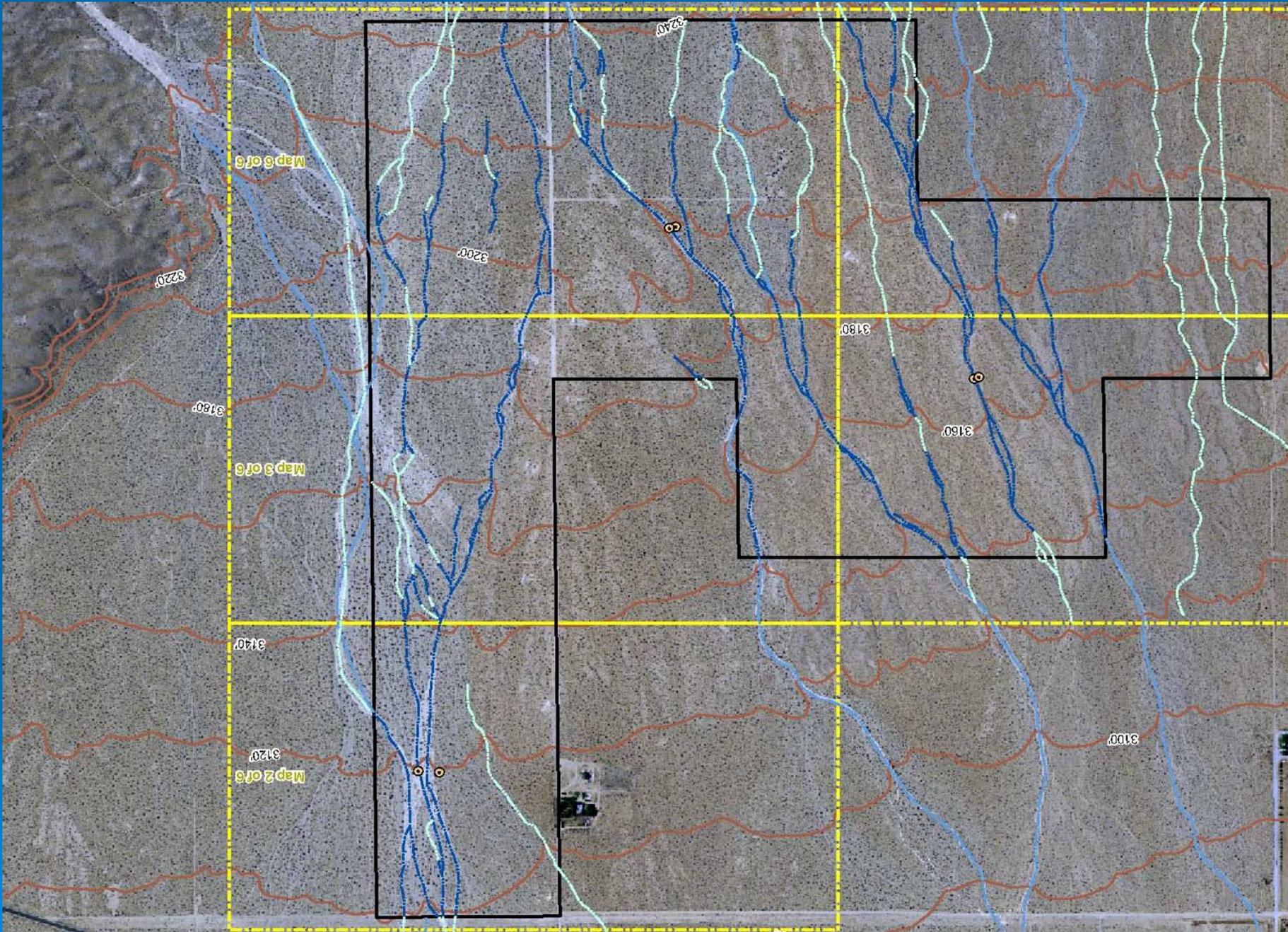
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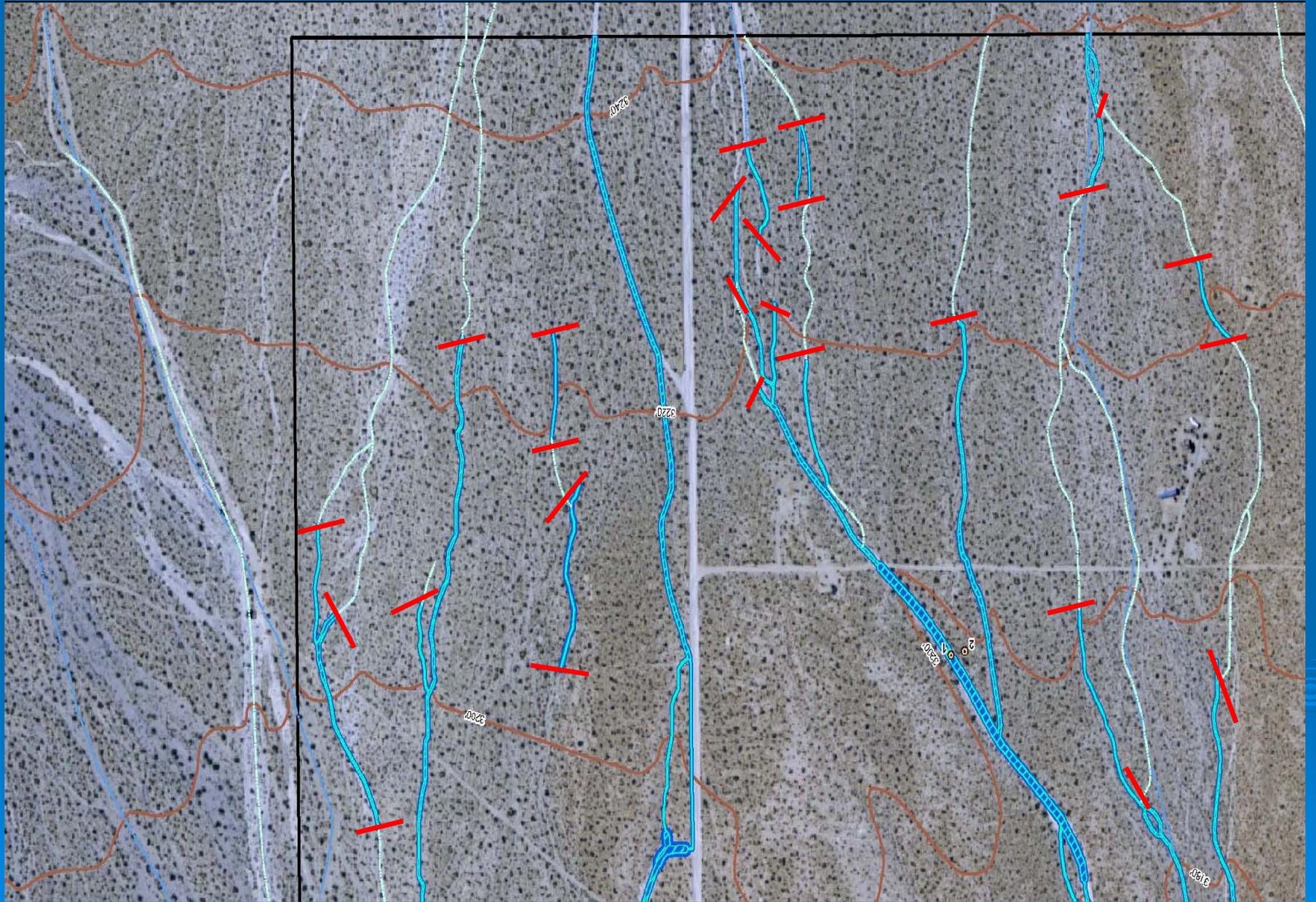
- Highly variable runoff between permeable versus relatively impermeable surfaces
- Downstream decreases in flow volume due to water losses into alluvial substrates that results in
- Discontinuous sediment transport that in turn results in
- A fabric of single-thread channel forms, distributary channel forms, well-defined erosional channel segments that alternate with depositional reaches lacking defined channel form, and channels that simply end as their flows infiltrate into the valley alluvium.







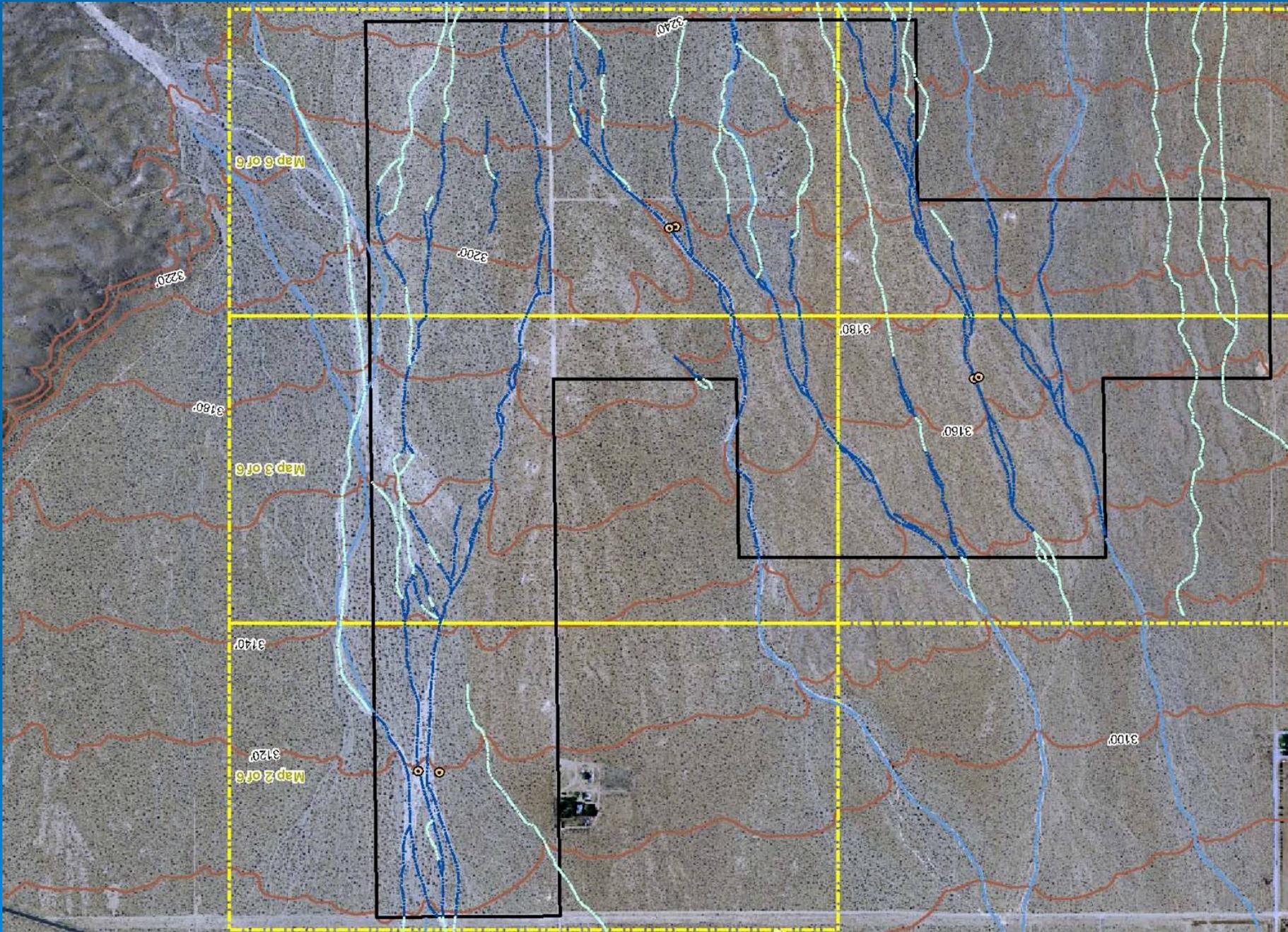




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# Sustainable project development depends on

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- Siting decisions and project designs that consider the physical processes active on a landscape
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# Environmentally sensitive project development depends on

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- Siting decisions and project designs that consider the physical processes active on a landscape
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# Projects that do not...

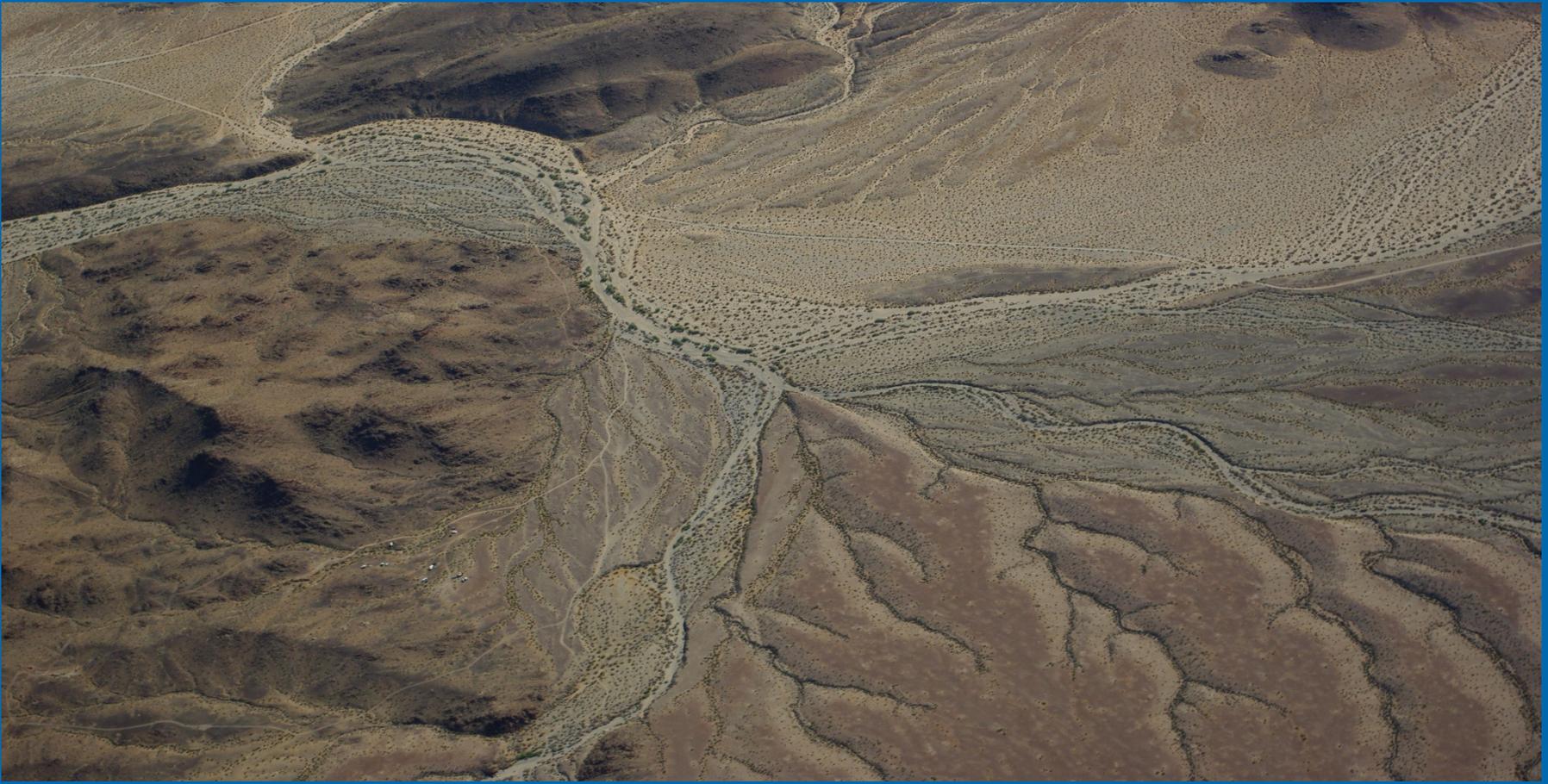
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- Invariably require subsequent measures to protect project performance and initial capital investments.
  - And these after-the-fact protective measures often necessarily extend beyond the original project footprint, and the natural environment is rarely immune to the impacts of such expansions.
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# Both of these goals ultimately depend on

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- The consistent use of a single science-based definition of a stream
  - And a stream ecosystem mapping and delineation method suitable for use in our dryland landscapes.
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***One of the most startling paradoxes of the world's drylands is that although they are lands of little rain, the details of their surfaces are mostly the products of the action of rivers. To understand the natural environments of drylands is to understand the process and forms of their rivers.***

***W.L. Graf (1988)***