

13 October 2022

**Mike Bromell**

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**Re: *Quoya zonalis* targeted flora survey at West Star Iron Bridge (Priority 1 area).**

### **Project Background and Survey Scope**

Ecologia Environment (*ecologia*) was engaged by FMG to undertake a targeted survey for the Threatened plant *Quoya zonalis* (Pilbara foxglove) at West Star Iron Bridge, located approximately 110 km south of Port Hedland and 75 km west of Marble Bar in the Pilbara IBRA region of Western Australia. *Quoya zonalis* is listed as Endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), and in Western Australia it is listed as Threatened under the *Biodiversity Conservation Act 2016* (BC Act). Under the EPBC Act it is currently listed under the name *Pityrodia* sp. Marble Bar (G.Woodman & D.Coultas GWDC Opp 4).

*Quoya zonalis* (Lamiaceae) is an erect shrub growing to approximately 2 m that generally occurs on steep rocky ironstone slopes in brown sandy loam soils. According to current records it is almost exclusively confined to the Capricorn land system. Due to its distinctive habit and colour it is easily identifiable in the field, and mature plants can be readily seen from over 50 meters (m).

The Priority 1 West Star survey area includes an existing access track and a drilling area, covering approximately 129 ha (Figure 1). The scope of this survey was to conduct a targeted survey for *Quoya zonalis* focussing on the existing access track, proposed access tracks and drill lines, and drill hole locations (Figure 1).

### **Methodology**

The survey was undertaken by *ecologia* Principal Botanist Andrew Craigie assisted by Mike Bromell (FMG) between 11 and 12 October 2022. The existing access track was initially driven to identify the locations of *Q. zonalis* individuals in the vicinity of the track to a distance of approximately 50 m on both sides. Additional survey effort was then undertaken on foot in areas along the access track identified as suitable habitat (i.e., steep rocky slopes). The proposed access tracks and drill lines were traversed on foot, and the area immediately surrounding each proposed drill hole was searched (Figure 1). The locations of individual plants were recorded with a handheld GPS, but where there were numerous plants occurring at the same point, a central location was marked and the abundance of plants within an approximate 3 m radius was recorded. Larger mature plants were marked with flagging tape.

### **Survey Limitations and Constraints**

Parts of the survey area had been recently burned within the previous two years. However, the primary habitat for *Q. zonalis* (steep rocky slopes and gullies) was comparatively unaffected by this fire, and the regeneration of perennial shrubs in recently burned areas was sufficient to be able to detect the presence of *Q. zonalis*. There were no significant limitations or constraints identified for this survey (Table 1).

## Results

A total of 611 *Q. zonalis* individuals were recorded within the survey area. It was generally associated with ironstone boulders on steep slopes and foot-slopes associated with cliffs and gullies, but it was occasionally recorded from stony summits of more gently sloping hills. It occurs mostly in small sub-populations of up to approximately 50 mature individuals that are rare in the landscape relative to the extent of potentially suitable habitat. Numerous seedling (< 5 cm high) were present at some sub-populations (Plate 1), and evidence of plants regenerating from the recent fire was also observed (Plate 1). At the time of the survey most mature individuals were in the late flowering-early fruiting stage (Plate 1).

The targeted survey traverses (Figure 1) were buffered by 25 m to represent an area of survey effort in which *Q. zonalis* was reasonably detectable. From this area, a 50 m buffer surrounding all *Q. zonalis* records was subtracted, resulting in an area which has been sufficiently surveyed and in which *Q. zonalis* is not present. These areas are shown in Figure 2 in relation to the proposed access tracks, drill lines, and drill hole locations. Spatial data of plant locations have been provided separately.

Best Regards,

A handwritten signature in black ink, appearing to read "Andrew Craigie", enclosed in a white rectangular box.

**Andrew Craigie**

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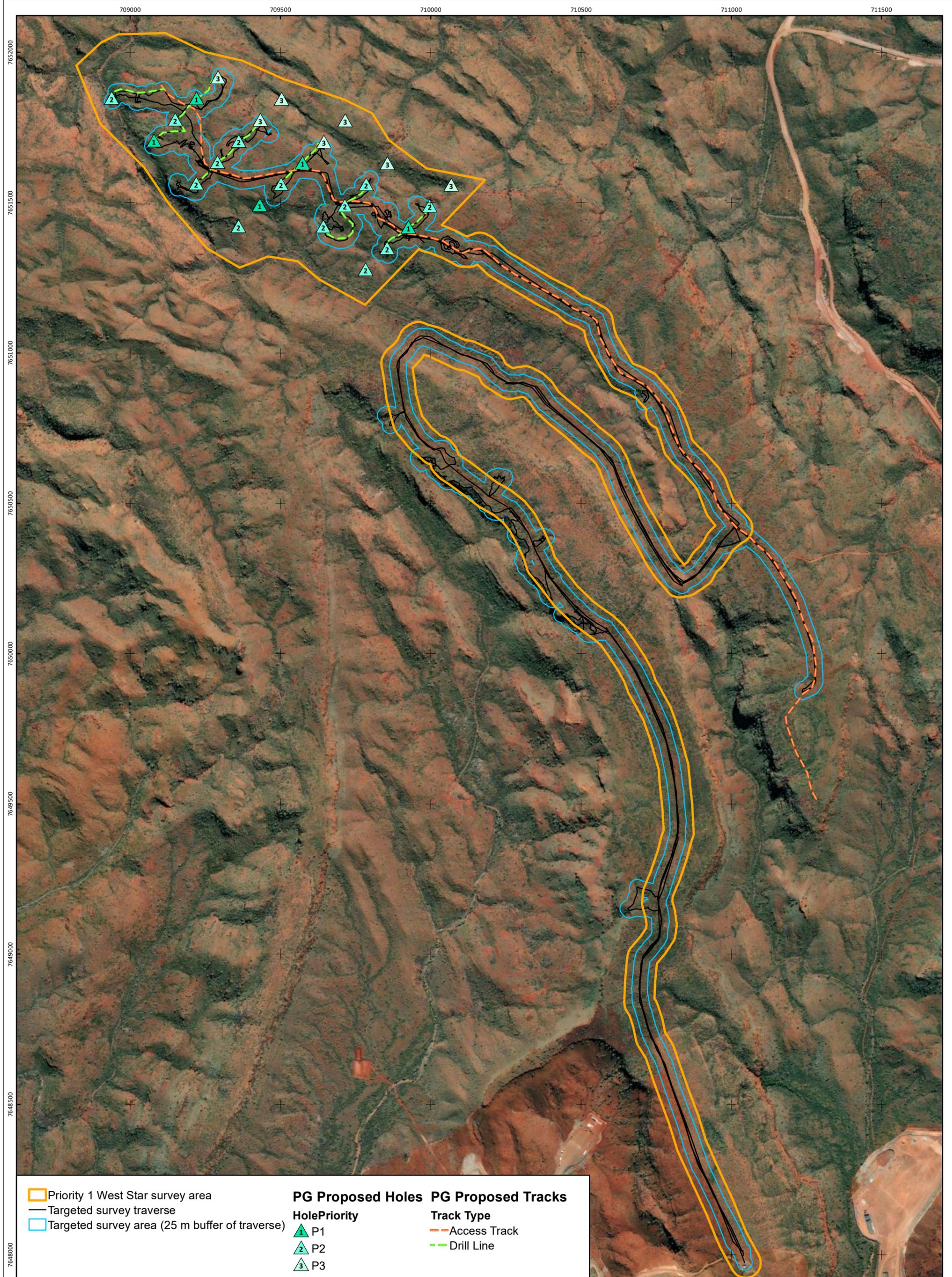




**Plate 1. Clockwise from top left: specimen of *Q. zonalis* in late flower/early fruit; seedling establishment; post-fire regeneration.**

**Table 1. Survey limitations and constraints.**

Aspect	Assessment	Constraint
Availability of contextual information at a regional and local scale	Broad vegetation, land system, soil, and geology mapping data were available for the survey area to assist identification of potentially suitable habitat, in addition to existing <i>Q. zonalis</i> records in the vicinity of the survey area. This information was adequate to provide appropriate contextual information for the survey.	Nil
Competency/experience of the team carrying out the survey, including experience in the bioregion surveyed	The <i>ecologia</i> staff member undertaking the field survey has over 10 years' experience undertaking flora and vegetation surveys in the Pilbara region, including targeted surveys for <i>Q. zonalis</i> .	Nil
Proportion of flora recorded and/or collected, any identification issues	<i>Quoya zonalis</i> is easily identified in the field by an experienced botanist. There were no identification issues.	Nil
Was the appropriate area fully surveyed (effort and extent)	The appropriate areas according to the scope of work were sufficiently surveyed.	Nil
Access restrictions within the survey area	There were no access restrictions.	Nil
Survey timing, rainfall, season of survey	<i>Quoya zonalis</i> is a perennial shrub that is easily recognisable in the field and does not require flowers or fruits accurate identification. Survey timing is therefore not a significant limitation for targeted surveys for this species.	Nil
Disturbance that may have affected the results of survey such as fire, flood or clearing	Relatively recent fire had affected parts of the survey area but this was not a significant limitation for the current survey.	Nil



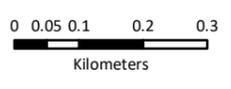
<ul style="list-style-type: none"> <li><span style="color: yellow;">▭</span> Priority 1 West Star survey area</li> <li><span style="color: black;">—</span> Targeted survey traverse</li> <li><span style="color: blue;">▭</span> Targeted survey area (25 m buffer of traverse)</li> </ul>	<p><b>PG Proposed Holes</b></p> <p><b>HolePriority</b></p> <ul style="list-style-type: none"> <li><span style="color: green;">▲</span> P1</li> <li><span style="color: green;">▲</span> P2</li> <li><span style="color: green;">▲</span> P3</li> </ul>	<p><b>PG Proposed Tracks</b></p> <p><b>Track Type</b></p> <ul style="list-style-type: none"> <li><span style="color: orange;">- - -</span> Access Track</li> <li><span style="color: green;">- - -</span> Drill Line</li> </ul>
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**Figure 1: Priority 1 West Star survey area and area surveyed.**



Project: 1945  
 Date: 13 October 2022  
 Author: AC  
 Coordinate System: GDA 1994 MGA Zone 50  
 Projection: Transverse Mercator  
 Absolute Scale: 1:11,000 @A3

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



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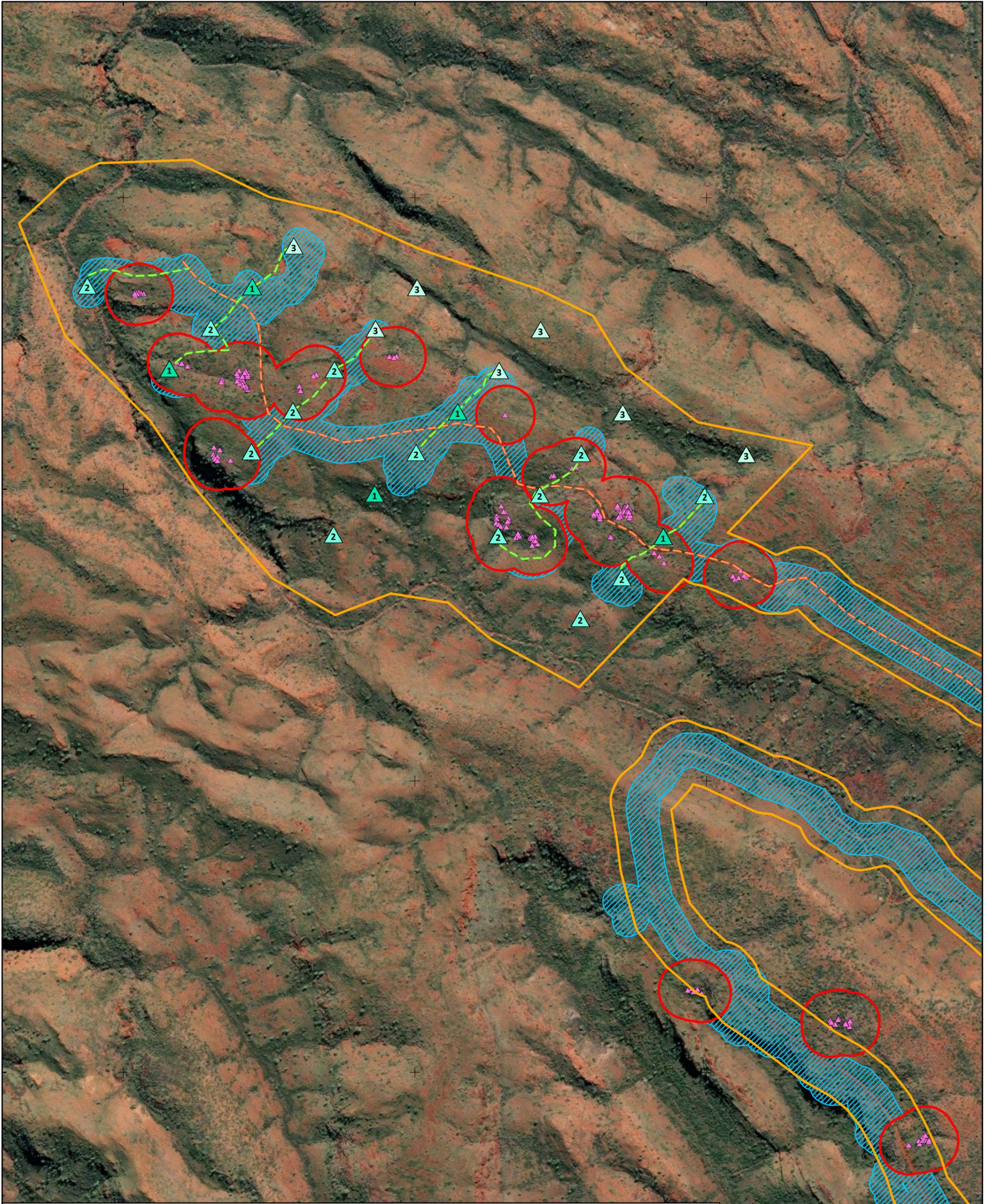
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- Priority 1 West Star survey area
- ▲ *Quoyia zonalis* record (October 2022)
- Quoyia zonalis* 50 m buffer
- Targeted survey area (*Quoyia zonalis* not present)

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|---|---|
| <p><b>PG Proposed Holes</b></p> <p><b>Hole Priority</b></p> <ul style="list-style-type: none"> <li><span style="color: green; font-size: 1.2em; margin-right: 5px;">▲</span> P1</li> <li><span style="color: cyan; font-size: 1.2em; margin-right: 5px;">▲</span> P2</li> <li><span style="color: lightblue; font-size: 1.2em; margin-right: 5px;">▲</span> P3</li> </ul> | <p><b>PG Proposed Tracks</b></p> <p><b>Track Type</b></p> <ul style="list-style-type: none"> <li><span style="border-bottom: 1px dashed orange; width: 20px; display: inline-block; margin-right: 5px;"></span> Access Track</li> <li><span style="border-bottom: 1px dashed green; width: 20px; display: inline-block; margin-right: 5px;"></span> Drill Line</li> </ul> |
|---|---|

**Figure 2: *Quoyia zonalis* records within the Priority 1 West Star survey area showing proposed hole and track locations.**