What impact will changes to the management of IPP sentences have on the number of IPPs in custody?

The results from a system dynamics model

Justice Episteme is a data analytics company (www.justice-episteme.com) specialising in analysis and simulation techniques in the criminal justice sector. A key aim is to support policy and service development, exploring change options better to inform choices about reform or other ways of improving outcomes

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Summary and conclusions

This analysis is motivated by current parliamentary consideration of the IPP sentence. It was carried out in consultation with Dr Roger Grimshaw (Research Director) of the Centre for Crime and Justice Studies (CCJS), and the preparation of the CCJS written evidence to the Justice Select Committee, November 2021.
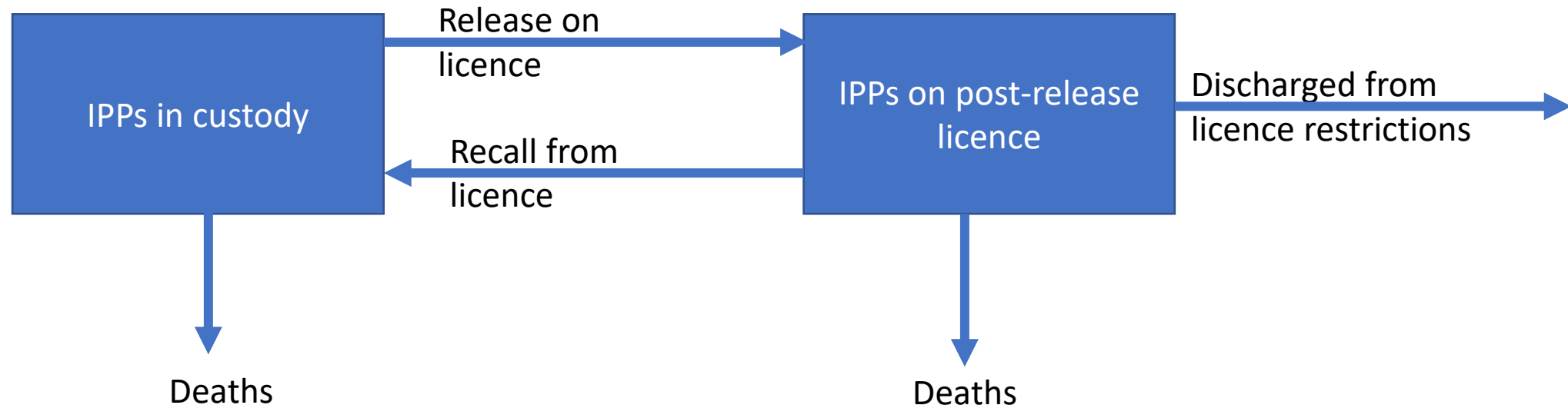
We use a two compartment model to simulate and forecast the number of IPP offenders in custody up to Jan 2030, assuming some illustrative changes to the breach rate, and to the mandatory period of post-release licence. The core estimates, depending on the scenario, range from ~1,900 (for no change) to ~600 (for a combination of halving the breach rate and reducing the mandatory supervision period to 2 years). See Table A, that shows 95% sensitivity intervals for the central estimates.

Table A. Estimated number of offenders in custody and post-release licence in Jan 2030 compared to a base case of no change

Scenario	In custody Jan 2030	Post-release licence Jan 2030
A. Base case, (i.e. no change to law or practice)	1,900, 95% interval [1730,2000]	1,120, , 95% interval [1030,1190]
B. Halve the recall rate	1,310, 95% interval [1160,1430]	1,440, 95% interval [1350,1510]
C. Mandatory post licence period 5 years	1,530, 95% interval [1360,1740]	800, 95% interval [770,860]
D. Mandatory post licence period 2 years	930, 95% interval [770,1120]	360, 95% interval [310,400]
E. B+C	1020, 95% interval [880,1120]	940, 95% interval [850,1010]
F. B + D	600, 95% interval [490,740]	340, 95% interval [290,370]

The model: two compartment system dynamics analysis

- The problem is modelled as two compartments with the dynamics of the number in custody or under supervision being controlled by four rates: the rate of release from custody, rate of recall for breaches of licence or further offending, rate of discharge from licence conditions and a (smaller) death rate. This is obviously a simplification of what is in effect a semi-closed system since IPP sentences were abolished in 2012. The model covers the period 2010 to 2030. It reproduces the occupancy of the number of offenders in custody with sufficient accuracy (when compared to published statistics) to give confidence as to the projections to 2030, under various conditions or assumptions

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┌─────────────────┐     Release on        ┌─────────────────┐
│                 │     licence    ──────► │                 │   Discharged from
│                 │                         │ IPPs on post-   │ ──────► licence restrictions
│ IPPs in custody │                         │ release         │
│                 │     Recall from         │ licence         │
│                 │ ◄──── licence           │                 │
└────────┬────────┘                         └────────┬────────┘
         │                                           │
         ▼                                           ▼
      Deaths                                      Deaths
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- The analysis presented in graphical form in the following charts explores the trajectory over time of the number of offenders in custody or under licence in the community. The following cases, which are potentially the easiest to deliver, are explored:

- Base case – no change the system operates as now

- The rate of recall is reduced by half (the majority of recalls appear to be a result of breach of conditions rather than further offences)

- Changes to the mandatory period of supervision from 10 years (as now) to 5 and 2 years respectively. This affects the number on licence and as a consequence of breaches, the number in custody

Technical Notes & References

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- The development of the model has been informed by data on the IPP population published by the Ministry of Justice, in particular https://www.gov.uk/government/collections/offender-management-statistics-quarterly, Table 1_9a, which gives information about IPPs that are unreleased as well as those recalled. NB: the published information is not always consistently presented, where the IPP population used for example in the aggregate indeterminate sentence figures of Table 1_1 count only those unreleased. Also the breakdown into unreleased and recalled IPP prisoners does not seem to be available before 2016.

- The model carries out a simulation over the period of 2010 to 2030. We have been able to identify effective release and recall rates that, when used in the relevant equations, reproduce the observed dynamics for the number of IPPs held in custody. Data on the number of IPP offenders under post-release supervision is not readily available so the accuracy of the model cannot (at this time) be checked in that respect. However, sensitivity analysis about this and the flow parameters, suggest that the relevant estimates, by Jan 2030, are quite robust. In part this is because the model prediction and published data on the number in custody over the period 2018 - 2021 are very close, and the future values will be driven by this region of time. The 95% sensitivity intervals are also shown in Table A, derived from 200 monte-carlo replications of the key parameters within a range of ± 10% of their estimated or effective scenario values. Broadly speaking these show that the sensitivity intervals span a range of approx. ± 10-15% of the central estimate, either in custody or post release supervision.

- The estimated effective flow rates have been informed by data on tariffs and recall rates published in the above reference as well as the Prison Reform Trust Report 'No life, no freedom, no future', 2020 and the House of Commons , Briefing Paper, Sentences of Imprisonment for Public Protection, Number 6086, 6 June 2019. A combined death rate applied across both compartments is informed from deaths in prison data, https://www.inquest.org.uk/deaths-in-prison, and death rates in the community by age group, http://www.bandolier.org.uk/booth/Risk/dyingage.html.

- The process of release to the community involves a number of stages, tariff served, risk assessments and the Parole Board. The empirically derived 'effective' release rate, which represents an average across the IPP population in custody (whether released or recalled) and is applied to the whole period of the simulation from 2010 to 2030. In this version of the analysis this is the same across the various scenarios (on the premise that this is likely to be the most problematic and complex to change or reform). A more refined analysis would be possible but has not been done in this assessment, particularly since the majority of IPP offenders who are unreleased are 'tariff time expired', so the risk assessment and the Parole Board part of the process will dominate the dynamics.

- For the change scenarios the start date is taken as January 2022

- This slide pack provides a simplified presentation of results. For more information on the technical details contact info@justice-episteme.com
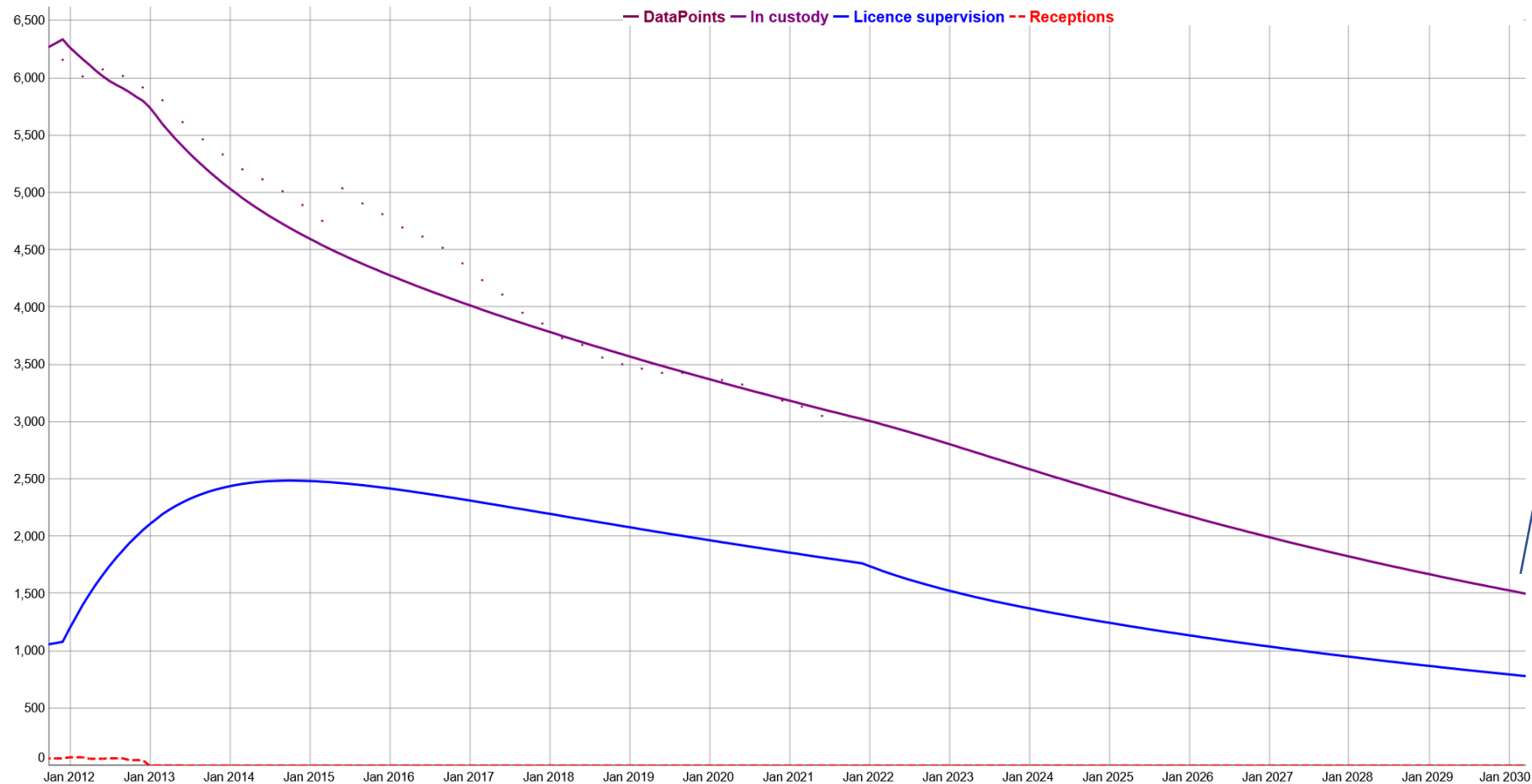
Case A: Base reference – no change
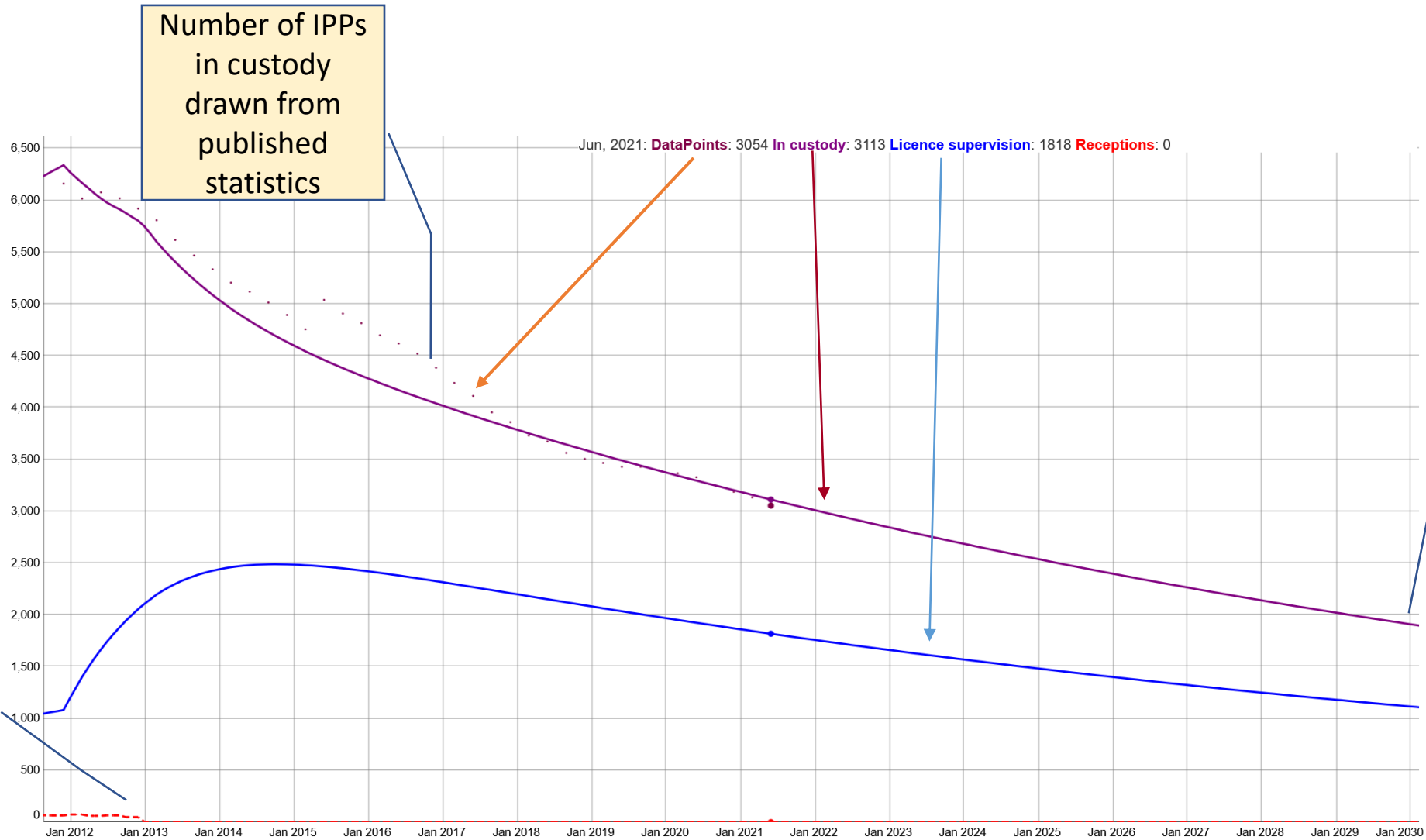
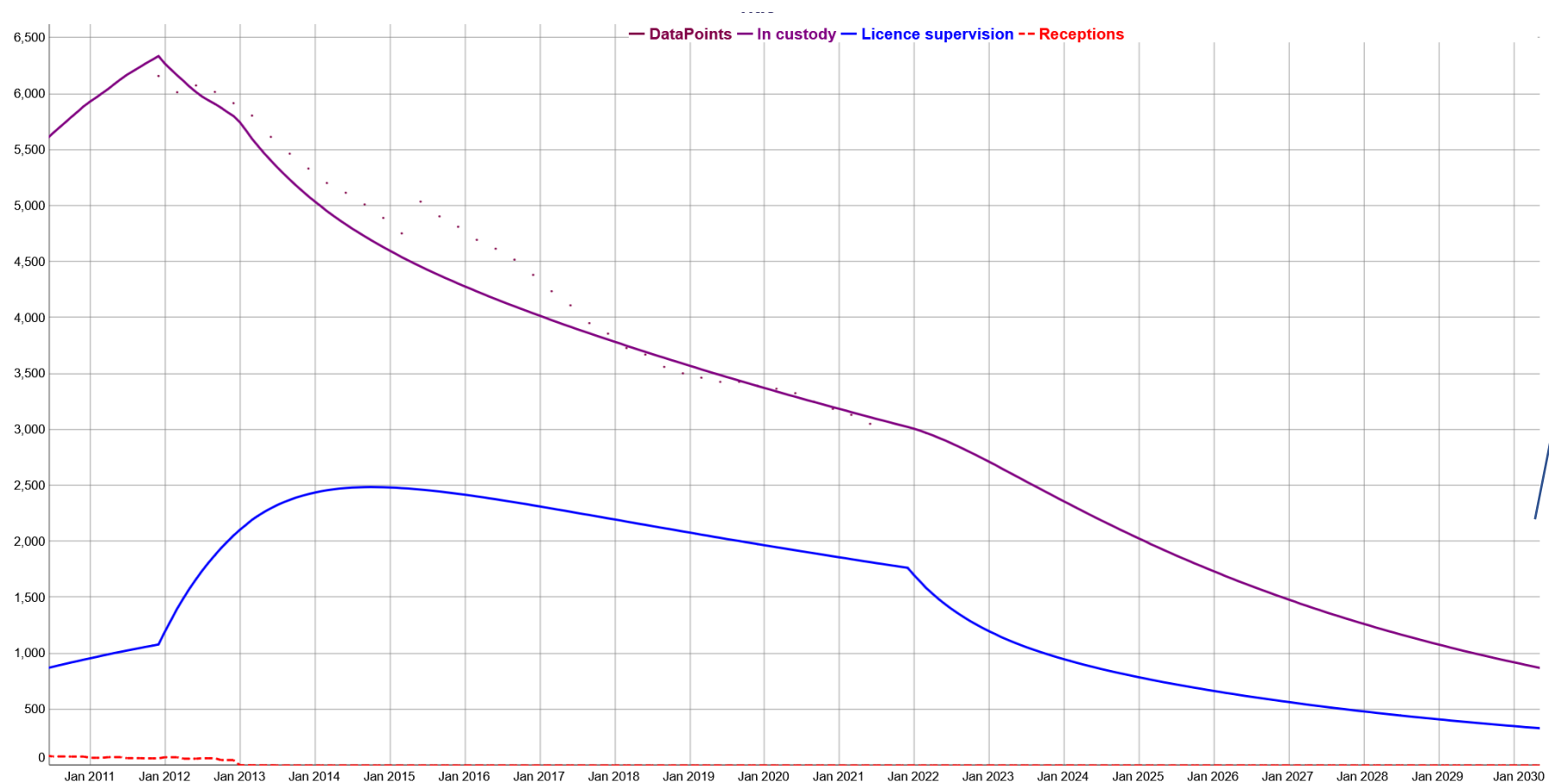# Case B: Reduce recall rate to half the current value
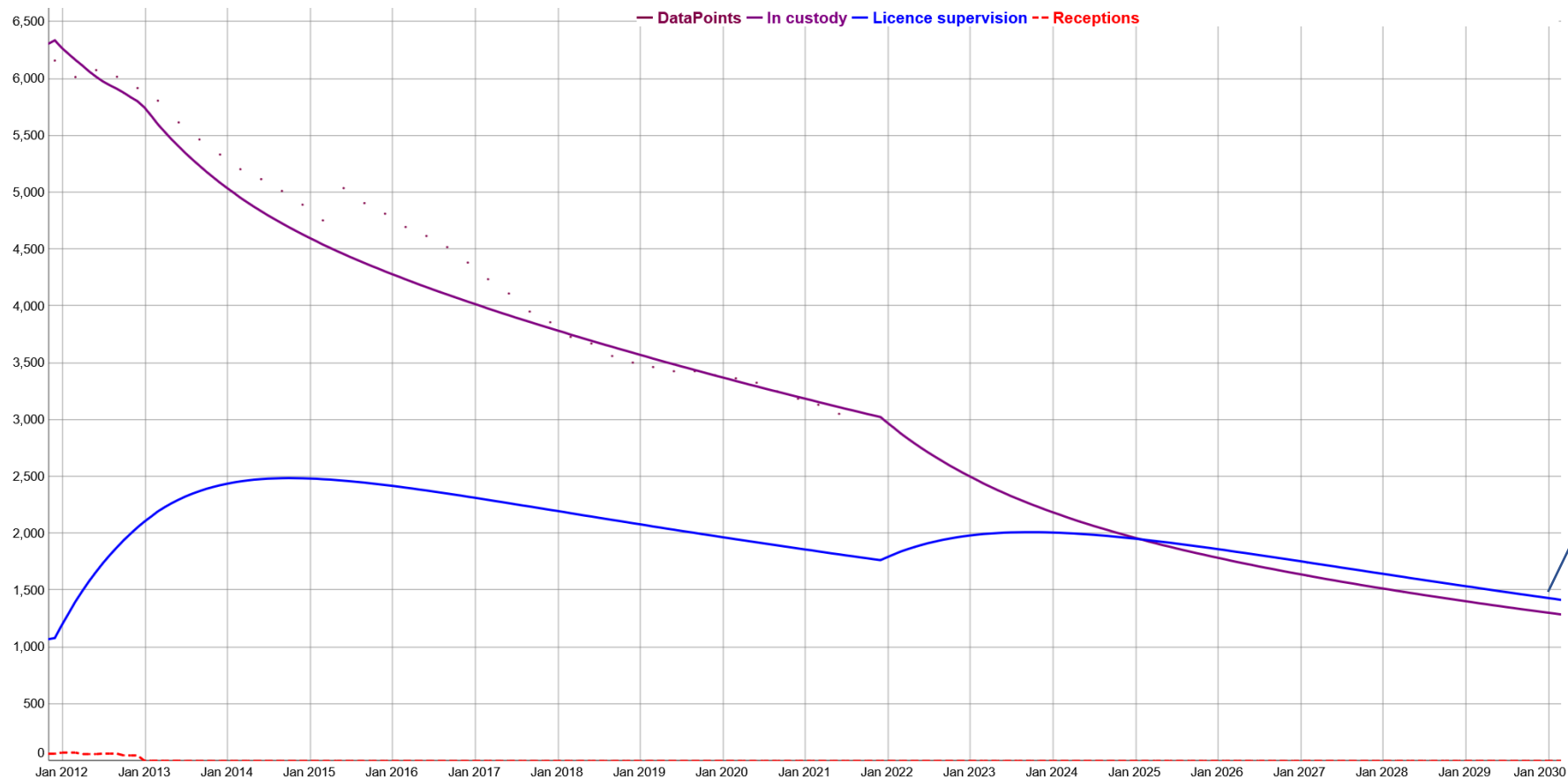
The estimated number in custody by 2030 is ~1,310, and on licence is ~1,440

Case C: Reduce the period of supervision from 10 to 5 years

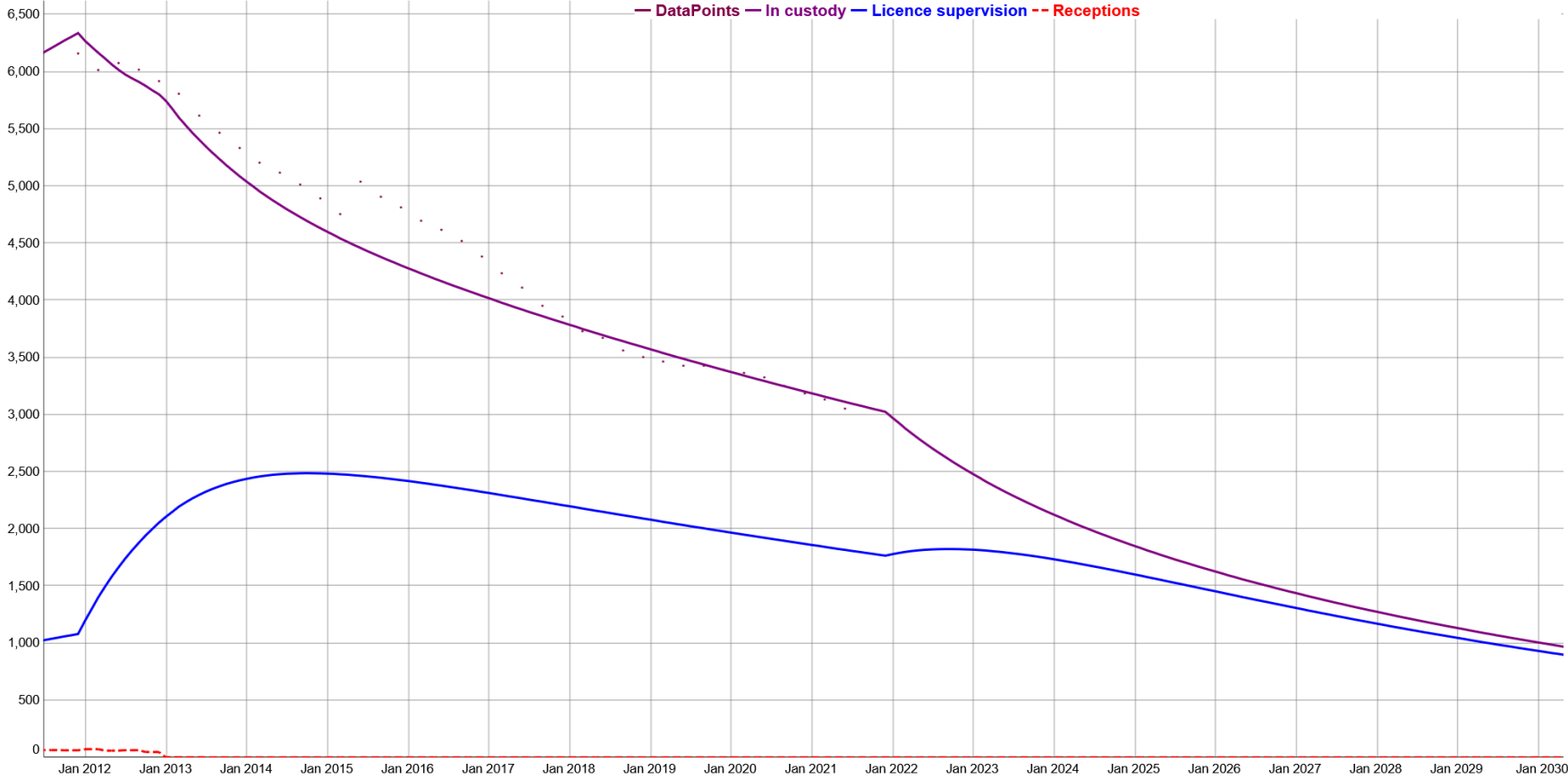Legend: DataPoints — In custody — Licence supervision -- Receptions

The estimated number in custody by 2030 is ~1,530, and on licence is ~800

# Case D: Reduce the period of supervision from 10 to 2 years

The estimated number in custody by 2030 is ~930, and on licence is ~360

Case E: Reduce recall rate to half the current value and reduce the period of supervision from 10 to 5 years
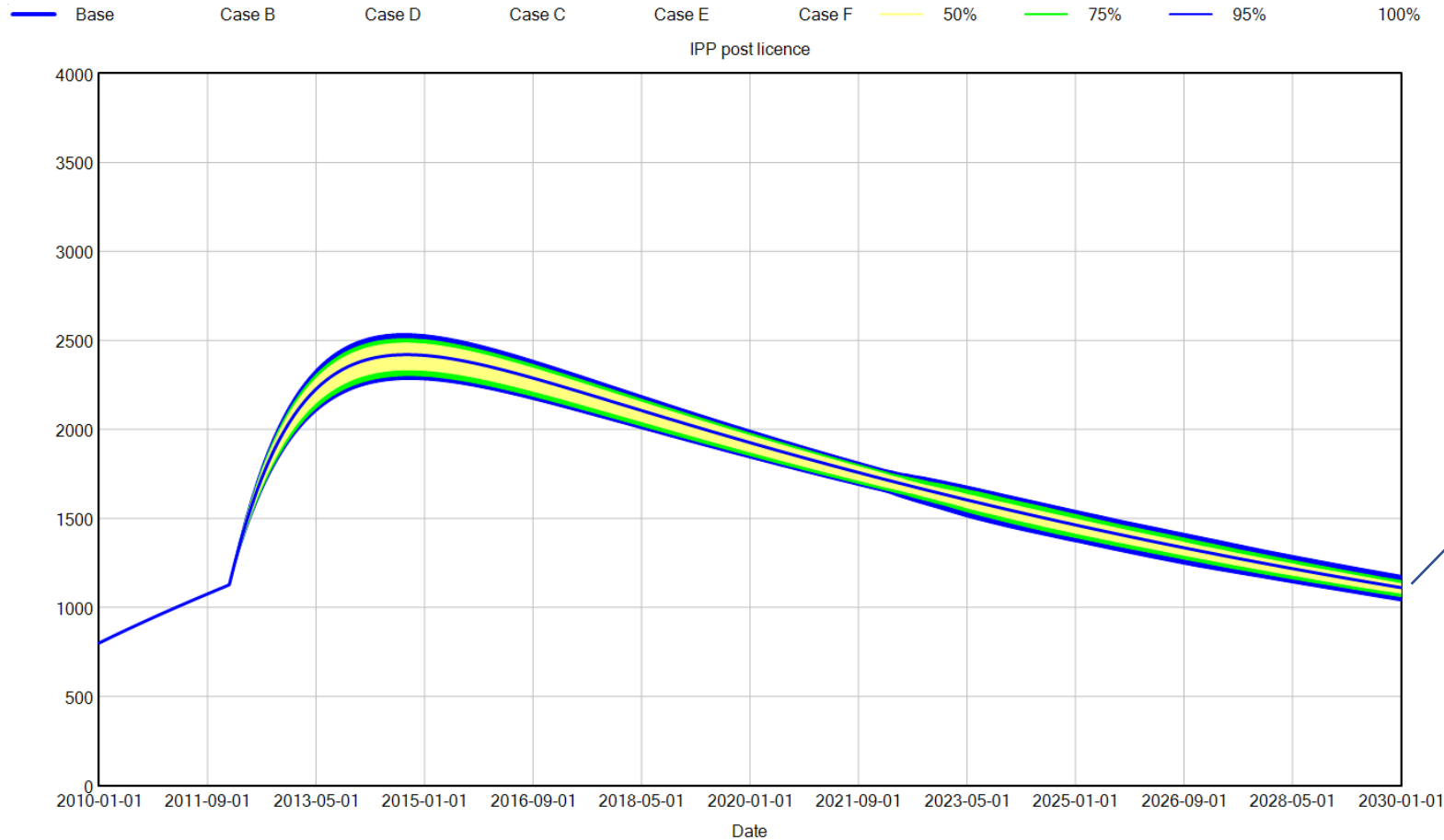

The estimated number in custody by 2030 is ~1,020, and on licence is ~940

Case F: Reduce recall rate to half the current value and reduce the period of supervision from 10 to 2 years
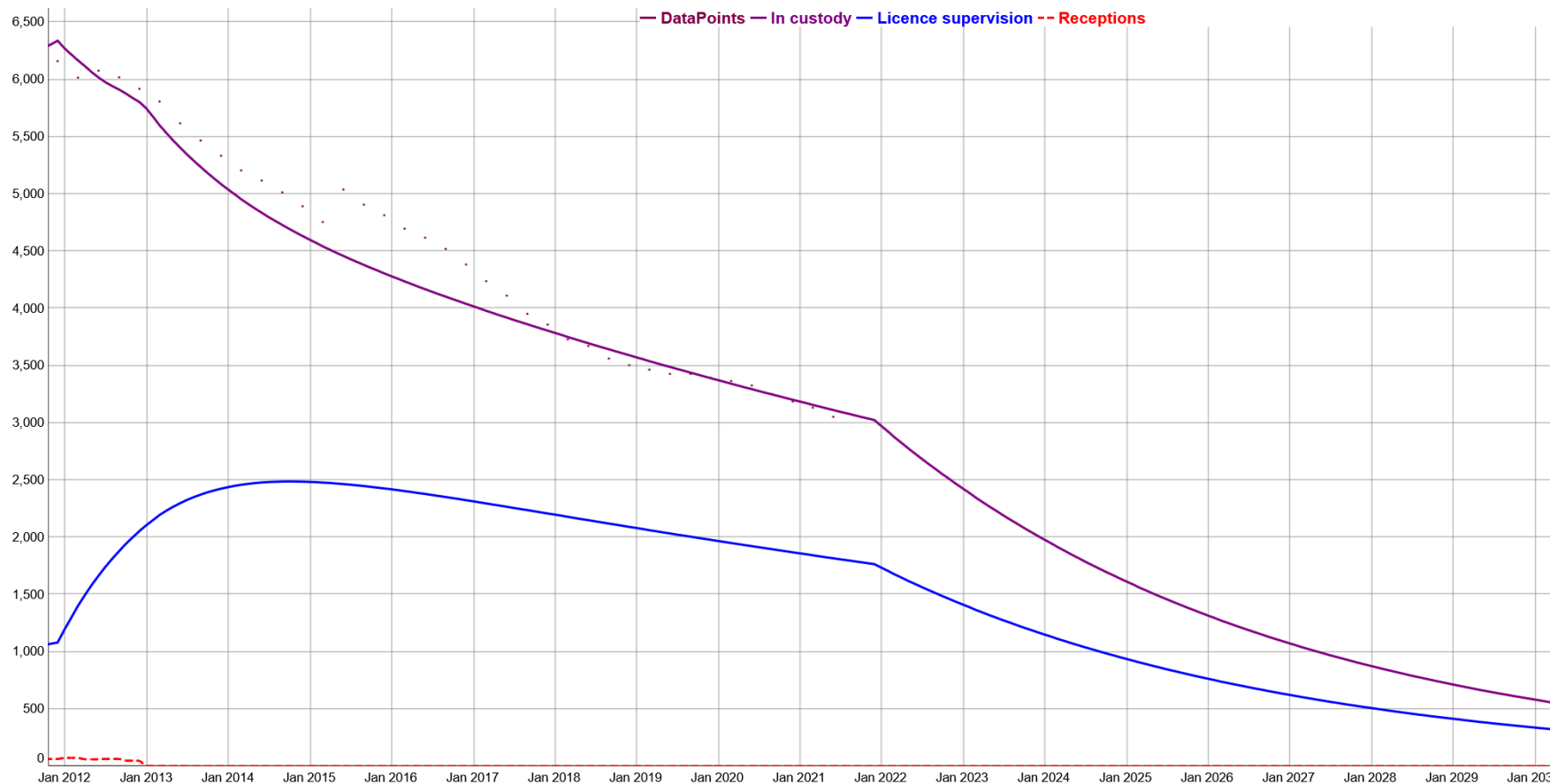
The estimated number in custody by 2030 is ~600, and on licence is ~340

Example, Case A: Base reference, sensitivity interval analysis – Number of IPPs post-release licence.

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95 % sensitivity interval for the base case is [1730,2000] with a core estimate of 1900

Comparison of the core estimates of the various scenarios for the number of IPPs in custody and post-release licence, 2010 to 2030